Appendix L

Relevant Regulations and Federal Permits

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This appendix highlights the U. S. Nuclear Regulatory Commission's (NRC's) regulations and Federal statutes and regulations enacted by other Federal agencies as well as Executive Orders that are applicable to decommissioning nuclear power plants.

L.1 Applicable NRC Regulations

A brief summary of the applicable regulations of Title 10 CFR related to decommissioning are provided in this subsection. Although not a comprehensive list, this appendix briefly discusses those regulations that are most pertinent to decommissioning and were considered to be potentially of greatest interest to the reader. Licensees of facilities being decommissioned are required to continue following the regulations applicable to an operating plant unless directed otherwise by the regulations.

L.1.1 10 CFR Part 20, Standards for Protection Against Radiation

Sections of 10 CFR Part 20 establish the NRC regulations pertaining to radiological protection.

Subpart B - Radiation Protection Programs

Subpart B of 10 CFR Part 20 provides the framework for the radiation protection programs required at licensed facilities. It requires that each licensee develop and implement a radiation protection program, that the concept of keeping doses as low as reasonably achievable (ALARA) be an integral part of the program, and that the licensee annually review the program to ensure compliance with all regulations. The need for an adequate radiation protection program is essential for decommissioning plants to ensure the health and welfare of the licensee's personnel and the public.

Subpart C - Occupational Dose Limits

Subpart C of 10 CFR Part 20 provides the radiological occupational dose limits for licensee personnel and the public and the method used to demonstrate compliance with these limits.

Subpart D - Radiation Dose Limits for Individual Members of the Public

Subpart D of 10 CFR Part 20 contains the regulations that define the maximum dose limits that an individual member of the public may receive and acceptable compliance methods. These regulations are applicable for operating and decommissioning plants until license termination. Appendix B provides reference material used for determining annual limits on intake and derived air concentrations of radionuclides for occupational exposure and effluent and sewage release concentrations.

Subpart E - Radiological Criteria for License Termination

Subpart E of 10 CFR Part 20 contains the radiological criteria for license termination that apply to unrestricted and restricted use. Important aspects of the criteria include the opportunity for public participation and the assurance of adequate decommissioning funds to ensure sufficient oversight to protect public health.

Subpart F - Surveys and Monitoring

Subpart F of 10 CFR Part 20 requires surveys and monitoring commensurate with the conditions at a licensed facility. Until the license is terminated at a facility, there is a potential for radiological exposure, which would necessitate continued radiological monitoring and surveys.

Subpart G - Control of Exposure from External Sources in Restricted Areas

Subpart G of 10 CFR Part 20 requires the licensee to control access to high and very high radiation areas. These regulations are applicable to a decommissioning plant, especially in the early years of decommissioning.

Subpart H - Respiratory Protection and Controls to Restrict Internal Exposure in Restricted Areas

Subpart H of 10 CFR Part 20 requires measures to control airborne radioactive materials and the use of protective equipment to limit personnel intake.

Subpart I - Storage and Control of Licensed Material

Subpart I of 10 CFR Part 20 addresses the security and control issues related to licensed material (source material or by-product material that includes highly irradiated materials).

Subpart J - Precautionary Procedures

Subpart J of 10 CFR Part 20 defines radiological posting requirements to indicate where radiation areas are located and to label containers of licensed materials. The minimum quantities that require labeling are provided in Appendix C of 10 CFR Part 20.

Subpart K - Waste Disposal

Subpart K of 10 CFR Part 20 provides the requirements for the disposal of licensed material, including low-level waste. It provides the regulations related to manifests and manifest tracking.

Subpart L - Records

Subpart L of 10 CFR Part 20 provides requirements for recordkeeping of radiological control records. This includes individual exposure records, historical recordkeeping, and any release of radioactive effluents to the environment. Audit rectors and other reviews of the radiological control program content and implementation are required to be maintained for a period of 3 yrs, which could conceivably extend beyond the decommissioning process.

Subpart M - Reports

Subpart M of 10 CFR Part 20 provides the regulations pertaining to reporting requirements at licensed facilities. The reporting requirements contained in this subpart pertain to theft or loss of licensed materials, incident notification, radiological exposures that exceed limits, special exposures, individual overexposure, and individual monitoring. Annual personnel monitoring reports on personnel exposure are also required to be submitted.

L.1.2 10 CFR Part 50, Domestic Licensing of Production and Utilization Facilities

10 CFR 50.82, Termination of License

The current rule for decommissioning was published in August 1996 providing major changes from the previous rule. The current rule redefines the decommissioning process and requires licensees to provide the NRC with early notification of planned decommissioning activities. The rule describes the following:

- information on certifications of permanent cessation of operation and permanent removal of fuel from the plant [10 CFR 50.82(a)(1)(i), and (ii)]

- the submittal of the post-shutdown decommissioning activities report (PSDAR) (10 CFR 50.82(a)(4)(i)), which discusses the decommissioning activities and schedule for the activities, an estimate of expected costs, and the reasons for concluding that the environmental impacts associated with the site-specific decommissioning activities will be bounded by previously described environmental impacts [10 CFR 50.82(a)(4)(i)]

- the restrictions of activities of licensees performing decommissioning activities that may (a) foreclose release of the site for possible unrestricted use, (b) result in significant environmental impacts not previously reviewed, or (c) result in there no longer being reasonable assurance that adequate funds will be available for decommissioning [10 CFR 50.82(a)(6)]

- the requirement for the licensee to notify the NRC before performing any decommissioning activity inconsistent with, or making any significant schedule change from, those activities and schedules described in the PSDAR [10 CFR 50.82(a)(7)]

- how the decommissioning trust funds can be used - Withdrawals from the decommissioning trust fund can only be used [10 CFR 50.82(a)(8)(i)]

  -- if they are used for legitimate decommissioning activities that are consistent with the definition of decommissioning in 10 CFR 50.2

  -- if they do not reduce the value of the decommissioning trust below an amount necessary to place and maintain the reactor in a safe storage condition if unforeseen expenses or conditions arise

  -- if they do not inhibit the ability of the licensee to complete funding of any shortfalls in the decommissioning trust needed to ensure the availability of funds to ultimately release the site and terminate the license.

- the amount of funds available to the licensee, which varies depending on the stage of decommissioning [10 CFR 50.82(a)(8)(ii)(iii)]

  -- initially, 3 percent of the generic amount specified in 10 CFR 50.75 may be used for decommissioning planning

  -- an additional 20 percent may be used 90 days after the NRC has received the PSDAR

-- remaining funds can be used following submittal of the site-specific decommissioning cost estimate, which is required within 2 yrs following permanent cessation of operation

- submittal of the license termination plan [10 CFR 50.82(a)(9)] and the termination of the license [10 CFR 50.82(a)(11)].

10 CFR 50.36, Technical Specifications

10 CFR 50.36(c)(6) describes requirements for technical specifications specific to decommissioning. However, the requirements of 10 CFR 50.36(a), (b) and (c) still remain applicable, as modified by paragraph (c)(6). For example, a decommissioning licensee should still evaluate paragraphs (c)(1) thru (5) regarding safety limits, limiting safety-system settings, limiting control settings, limiting conditions for operation, surveillance requirements, design features, and administrative controls; (c)(7) regarding initial notification reports; and (c)(8) regarding written reports. This is reflected by the requirement of 10 CFR 50.36(e), which states that the "provisions of this section apply to each nuclear reactor licensee whose authority to operate the reactor has been removed by license amendment, order, or regulations."

10 CFR 50.48, Fire Protection

10 CFR 50.48(f) requires that licensees of permanently shutdown nuclear power plants maintain a fire-protection program to address the potential for fires that could result in the release or spread of radioactive materials.

10 CFR 50.59, Changes, Tests, and Experiments

This section allows licensees to make changes to facilities undergoing decommissioning using these requirements.

10 CFR 50.65, Requirements for Monitoring the Effectiveness of Maintenance at Nuclear Power Plants

The maintenance rule (10 CFR 50.65) requires monitoring the performance or condition of structures, systems, or components (SSCs). For licensees that have permanently ceased operation, this section applies only to the extent that the licensee shall monitor the performance or condition of SSCs associated with the storage, control, and maintenance of spent fuel. The number of SSCs within the maintenance rule program at a decommissioning facility will be significantly less than that at an operating facility.

10 CFR 50.68, Criticality Accident Requirements

This section describes the requirements that are used in lieu of maintaining a monitoring system capable of detecting a criticality in the spent fuel pool, as described in 10 CFR 7.24.

10 CFR 50.71, Inspection

This section describes the maintenance of records and making of reports. Although all paragraphs of this section are applicable, one difference between an operating facility and one being decommissioned is the requirement to update the final safety analysis report, or equivalent. As described in 10 CFR 50.71(e)(4), the decommissioning requirement is for revisions to be filed every 24 months.

10 CFR 50.73, Licensee Event Reporting System

Licensees are still required to submit a licensee event report for specific events described in the regulations within 30 days after discovery of the event. This includes airborne or liquid-effluent releases at specific levels above the concentrations in Appendix B to 10 CFR Part 20.

10 CFR 50.75, Reporting and Recordkeeping for Decommissioning Planning

Reporting and recordkeeping require that subsequent revisions updating the licensing basis must be filed with the NRC at least every 24 months by nuclear power facilities that have certified permanent cessation of operation and permanent removal of fuel for decommissioning planning. This regulation, in part, discusses how the licensee will provide reasonable assurance that funds will be available for decommissioning of the nuclear reactor.

L.1.3 10 CFR Part 71, Packaging and Transportation of Radioactive Material

Requirements for packaging, preparation for shipment, and transportation of licensed (radioactive) material are provided in these regulations. In addition, these regulations refer to the regulations of the Department of Transportation given in Title 49 of the Code of Federal Regulations.

L.2 Federal Statutes

Following are examples of major laws, regulations, and other requirements that may be applicable to decommissioning and environmental evaluations that occur during the decommissioning process.

American Indian Religious Freedom Act of 1978 (42 USC 1996): This act reaffirms Native American religious freedom under the First Amendment and sets United States policy to protect and preserve the inherent and constitutional right of American Indians to believe, express, and exercise their traditional religions. The act requires that Federal actions avoid interfering with access to sacred locations and traditional resources that are integral to the practice of religions.

Archaeological Resource Protection Act, as amended (16 USC 470aa et seq.): This Act requires a permit for any excavation or removal of archaeological resources from public or Indian lands. Excavations must be undertaken for the purpose of furthering archaeological knowledge in the public interest, and resources removed are to remain the property of the United States. Consent must be obtained from the Indian tribe owning lands on which a resource is located before issuance of a permit, and the permit must contain terms or conditions requested by the tribe.

Atomic Energy Act of 1954, as amended (42 USC 2011 et seq.): The Atomic Energy Act of 1954 authorizes NRC to regulate the Nation's civilian use of by-product, source, and special nuclear materials to ensure adequate protection of the public health and safety and the U.S. Department of Energy (DOE) to establish standards to protect health or minimize dangers to life or property with respect to activities under its jurisdiction. The Atomic Energy Act and the Reorganization Plan No. 3 of 1970 [5 USC (app. at 1343)] and other related statutes gave the U.S. Environmental Protection Agency (EPA) responsibility and authority for developing generally applicable environmental standards for protection of the general environment from radioactive material. The EPA has promulgated several regulations under this authority.

Bald and Golden Eagle Protection Act, as amended (16 USC 668-668d): The Bald and Golden Eagle Protection Act makes it unlawful to take, pursue, molest, or disturb bald (American) and golden eagles, their nests, or their eggs anywhere in the United States (Section 668, 668c). A permit must be obtained from the U.S. Department of the Interior to relocate a nest that interferes with resource development or recovery operations.

Clean Air Act, as amended (42 USC 7401 et seq.): The Clean Air Act, as amended, is intended to "protect and enhance the quality of the Nation's air resources so as to promote the public health and welfare and the productive capacity of its population." Section 118 of the Clean Air Act, as amended, requires that each Federal agency, such as DOE, with jurisdiction over any property or facility that might result in the discharge of air pollutants, comply with "all Federal, state, interstate, and local requirements" with regard to the control and abatement of air pollution. The Act requires the EPA to establish National Ambient Air Quality Standards as necessary to protect public health, with an adequate margin of safety, from any known or anticipated adverse effects of a regulated pollutant (42 USC 7409). The Act also requires establishing national standards of performance for new or modified stationary sources of

atmospheric pollutants (42 USC 7411) and requires specific emission increases to be evaluated so as to prevent a significant deterioration in air quality (42 USC 7470). Hazardous air pollutants, including radionuclides, are regulated separately (42 USC 7412). Air emissions are regulated by the EPA in 40 CFR Parts 50 through 99. In particular, radionuclide emissions and hazardous air pollutants are regulated under the National Emission Standard for Hazardous Air Pollutants Program (see 40 CFR Parts 61 and 63).

Clean Water Act, as amended (33 USC 1251 et seq.): The Clean Water Act, which amended the Federal Water Pollution Control Act, was enacted to "restore and maintain the chemical, physical and biological integrity of the Nation's water." The Clean Water Act prohibits the "discharge of toxic pollutants in toxic amounts" to navigable waters of the United States. Section 313 of the Clean Water Act, as amended, requires all branches of the Federal government engaged in any activity that might result in a discharge or runoff of pollutants to surface waters to comply with Federal, State, interstate, and local requirements. In addition to setting water quality standards for the nation's waterways, the Clean Water Act supplies guidelines and limitations for effluent discharges from point-source discharges and provides authority for the EPA to implement the National Pollutant Discharge Elimination System (NPDES) permitting program. The NPDES program is administered by the Water Management Division of the EPA pursuant to regulations in 40 CFR Part 122 et seq.

Sections 401 and 405 of the Water Quality Act of 1987 added Section 402(p) to the Clean Water Act Section 402(p) requires that the Environmental Protection Act establish regulations for issuing permits for stormwater discharges associated with industrial activity. Stormwater discharges associated with industrial activity are permitted through the NPDES. General Permit requirements are published in 40 CFR Part 122.

Emergency Planning and Community Right-to-Know Act of 1986 (42 USC 11001 et seq.) (also known as SARA Title III): Under Subtitle A of this Act, Federal facilities provide various information (such as inventories of specific chemicals used or stored and releases that occur from these sites) to the State Emergency Response Commission and to the Local Emergency Planning Committee to ensure that emergency plans are sufficient to respond to unplanned releases of hazardous substances. Implementation of the provisions of this Act began voluntarily in 1987, and inventory and annual emissions reporting began in 1988, based on 1987 activities and information. The requirements for this Act were promulgated by the EPA in 40 CFR Parts 350 through 372.

Endangered Species Act, as amended (16 USC 1531 et seq.): The Endangered Species Act, as amended, is intended to prevent the further decline of endangered and threatened species and to restore these species and their habitats. The Act is jointly administered by the U.S. Departments of Commerce and the Interior. Section 7 of the Act requires consultation with the

U.S. Fish and Wildlife Service to determine whether endangered and threatened species or their critical habitats are known to be in the vicinity of the proposed action.

Migratory Bird Treaty Act, as amended (10 USC 703 at seq.): The Migratory Bird Treaty Act, as amended, is intended to protect birds that have common migration patterns between the United States and Canada, Mexico, Japan, and Russia. It regulates the harvest of migratory birds by specifying the mode of harvest, hunting seasons, and bag limits. The Act stipulates that it is unlawful at any time, by any means, or in any manner to "kill ... any migratory bird." Although no permit is required under the Act, Federal agencies are required to consult with the U.S. Fish and Wildlife Service regarding impacts to migratory birds and to evaluate ways to avoid these effects in accordance with the U.S. Fish and Wildlife Service Mitigation Policy.

Native American Grave Protection and Repatriation Act of 1990 (25 USC 3001): This law directs the Secretary of Interior to guide responsibilities in repatriation of Federal archaeological collections and collections held by museums receiving Federal funding that are culturally affiliated to Native American tribes. Major actions to be taken under this law include (a) establishing a review committee with monitoring and policy-making responsibilities, (b) developing regulations for repatriation, including procedures for identifying lineal descent or cultural affiliation needed for claims, (c) overseeing of museum programs designed to meet the inventory requirements and deadlines of this law, and (d) developing procedures to handle unexpected discoveries of graves or grave goods during activities on Federal or tribal land.

National Environmental Policy Act of 1969 as amended (42 USC 4321 et seq.): The National Environmental Policy Act (NEPA) establishes a national policy promoting awareness of the environmental consequences of the activity of humans on the environment and promoting consideration of the environmental impacts during the planning and decisionmaking stages of a project. NEPA requires all agencies of the Federal government to prepare a detailed statement on the environmental effects of proposed major Federal actions that may significantly affect the quality of the human environment. The environmental document should discuss reasonable alternatives to the proposed action and their potential environmental consequences in accordance with the Council on Environmental Quality regulations for implementing the procedural provisions of the NEPA Implementing Procedures (40 CFR Parts 1501 through 1508) and NRC implementing regulations (10 CFR Part 51).

National Historic Preservation Act, as amended (16 USC 470 et seq.): The National Historic Preservation Act, as amended, provides that sites with significant national historic value be placed on the *National Register of Historic Places.* There are no permits or certifications required under the Act. However, if a particular Federal activity may impact a historic property resource, consultation with the Advisory Council on Historic Preservation will generally generate a Memorandum of Agreement, including stipulations that must be followed to minimize adverse

impacts. Coordinations with the State Historic Preservation officer are also undertaken to ensure that potentially significant sites are properly identified and appropriate mitigative actions are implemented. These regulations are included in 36 CFR Part 800. 10 CFR Part 63 contains guidance by which historic properties are evaluated and determined eligible for listing on the National Register.

Noise Control Act of 1972, as amended (42 USC 4901 et seq.): Section 4 of the Noise Control Act of 1972, as amended, directs all Federal agencies to carry out "to the fullest extent within their authority" programs within their jurisdictions in a manner that furthers a national policy of promoting an environment free from noise that jeopardizes health and welfare.

Nuclear Waste Policy Act of 1982, as amended (42 USC 10101): The Act authorizes the Federal agencies to develop a geologic repository for the permanent disposal of spent nuclear fuel and high-level radioactive waste. The Act specifies the process for selecting a repository site and constructing, operating, closing, and decommissioning the repository. The Act also establishes programmatic guidance for these activities, including guidance to the NRC regarding the adoption of DOE's EIS for the proposed repository.

Occupational Safety and Health Act of 1970, as amended (29 USC 651 et seq.): The Occupational Safety and Health Act establishes standards to enhance safe and healthful working conditions in places of employment throughout the United States. The Act is administered and enforced by the Occupational Safety and Health Administration, a U.S. Department of Labor agency. While the Occupational Safety and Health Administration and the EPA both have a mandate to reduce exposures to toxic substances, the Occupational Safety and Health Administration's jurisdiction is limited to safety and health conditions that exist in the workplace environment. In general, under the Act, it is the duty of each employer to furnish all employees a place of employment free of recognized hazards likely to cause death or serious physical harm. Employees have a duty to comply with the occupational safety and health standards and all rules, regulations, and orders issued under the Act. Occupational Safety and Health Administration regulations (published in Title 29 of the Code of Federal Regulations) establish specific standards telling employers what must be done to achieve a safe and healthful working environment.

Pollution Prevention Act of 1990 (42 USC 13101 et seq.): The Pollution Prevention Act of 1990 establishes a national policy for waste management and pollution control that focuses first on source reduction, followed sequentially by environmentally safe recycling, treatment, and disposal. Disposal or releases to the environment should only occur as a last resort.

Resource Conservation and Recovery Act, as amended (42 USC 6901 et seq.): The treatment, storage, or disposal of hazardous and nonhazardous waste is regulated under the Solid Waste

Disposal Act, as amended by the Resource Conservation and Recovery Act and the Hazardous and Solid Waste Amendments of 1984. Pursuant to Section 3006 of the Act, any State that seeks to administer and enforce a hazardous waste program pursuant to the Resource Conservation and Recovery Act may apply for EPA authorization of its program. The EPA regulations implementing the Resource Conservation and Recovery Act are found in 40 CFR Parts 260 through 280. These regulations define hazardous wastes and specify hazardous waste transportation, handling, treatment, storage, and disposal requirements.

The regulations imposed on a generator or a treatment, storage, and/or disposal facility vary according to the type and quantity of material or waste generated, treated, stored, and/or disposed of. The method of treatment, storage, and/or disposal also impacts the extent and complexity of the requirements.

Safe Drinking Water Act, as amended (42 USC 300 [F] et seq.): The primary objective of the Safe Drinking Water Act, as amended, is to protect the quality of the public water supplies and all sources of drinking water. The implementing regulations, administered by the EPA unless delegated to the states, establish standards applicable to public water systems. They promulgate maximum contaminant levels, including those for radioactivity, in public water systems, which are defined as public water systems that serve at least 15 service connections used by year-round residents or regularly serve at least 25 yr-round residents. Safe Drinking Water Act requirements have been promulgated by the EPA in 40 CFR Parts 100 through 149. For radionuclides, the regulations in effect now specify that the average annual concentration of beta particle and photon radioactivity from manmade radionuclides in drinking water shall not produce an annual dose equivalent to the total body or any internal organ greater than 0.004 rem (4 millirem) per year. The maximum contaminant level for gross alpha particle activity is 15 picocuries per liter. The EPA proposed revisions to limits on regulating radionuclides on July 18, 1991. The proposed rule has not been finalized, and the more conservative standards were used for purposes of analysis. Other programs established by the Safe Drinking Water Act include the Sole Source Aquifer Program, the Wellhead Protection Program, and the Underground Injection Control Program.

Toxic Substances Control Act (15 USC 2601 et seq.): The Toxic Substances Control Act provides the EPA with the authority to require testing of chemical substances, both new and old, entering the environment and regulates them where necessary. The law complements and expands existing toxic substance laws such as §112 of the Clean Air Act and §307 of the Clean Water Act. The Toxic Substances Control Act came about because there were no general Federal regulations for the potential environmental or health effects of the thousands of new chemicals developed each year before they were introduced into the public or commerce. The Toxic Substances Control Act also regulates the treatment, storage, and disposal of toxic substances, specifically polychlorinated biphenyls, chlorofluorocarbons, asbestos, dioxins, certain

metal-working fluids, and hexavalent chromium. The asbestos regulations under the Toxic Substances Control Act were ultimately overturned. However, regulations pertaining to asbestos removal, storage, and disposal are promulgated through the National Emission Standard for Hazardous Air Pollutants Program (40 CFR Part 61, Subpart M). For chlorofluorocarbons, Title VI of the Clean Air Act Amendments of 1990 requires a reduction of chlorofluorocarbons beginning in 1991 and prohibits production beginning in 2000.

L.3 Executive Orders

During the history of NEPA implementation, a number of Executive Orders have been issued that may be applicable to environmental evaluation during the decommissioning process. The following provides a short summary of some of these Orders.

Executive Order 11988 (Floodplain Management): Directs Federal agencies to establish procedures to ensure that the potential effects of flood hazards and floodplain management are considered for any action undertaken in a floodplain and that floodplain impacts be avoided to the extent practicable.

Executive Order 11990 (Protection of Wetlands): Directs government agencies to avoid, to the extent practicable, any short- and long-term adverse impacts on wetlands wherever there is a practicable alternative.

Executive Order 12898 (Environmental Justice): Directs Federal agencies to achieve environmental justice by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low-income populations in the United States and its territories and possessions. The Order creates an Interagency Working Group on Environmental Justice and directs each Federal agency to develop strategies within prescribed time limits to identify and address environmental justice concerns. The Order further directs each Federal agency to collect, maintain, and analyze information on the race, national origin, income level, and other readily accessible and appropriate information for areas surrounding facilities or sites expected to have a substantial environmental, human health, or economic effect on the surrounding populations, when such facilities or sites become the subject of a substantial Federal environmental administrative or judicial action and to make such information publicly available.

Executive Order 13007 (Indian Sacred Sites): Directs Federal agencies to accommodate, to the extent practicable, access to and ceremonial use of Indian sacred sites by Indian religious practitioners, and avoid adversely affecting the physical integrity of these sites.