U.S.NRC
United States Nuclear Regulatory Commission
Protecting People and the Environment

Final Environmental Impact Statement for an Early Site Permit at the Clinch River Nuclear Site

Reader's Guide

April 2019

NRC ADAMS Accession Number: ML19045A621

INTRODUCTION

The Tennessee Valley Authority (TVA) submitted an application to the U.S. Nuclear Regulatory Commission (NRC) on May 12, 2016, for an early site permit (ESP) for the Clinch River Nuclear (CRN) Site in Oak Ridge, Roane County, Tennessee, for new nuclear power units demonstrating small modular reactor technology. The NRC has reviewed that application.

WHAT IS AN EARLY SITE PERMIT?

An ESP is Commission approval of a site for one or more nuclear power facilities. The ESP application and review process makes it possible to evaluate and resolve safety and environmental issues related to siting before the applicant makes a large commitment of resources. If the ESP is approved, the applicant can "bank" the site for up to 20 years for future reactor siting.

An ESP does not authorize the actual construction and operation of a new nuclear power plant. To construct and operate a nuclear power plant, the holder of an ESP must obtain from the NRC a construction permit and an operating license, or a combined license, each of which are separate actions that require their own safety and environmental reviews.

WHAT IS THIS DOCUMENT?

The NRC has reviewed the application submitted by TVA and prepared a final environmental impact statement for an ESP for the CRN Site. This document, the Reader's Guide, summarizes the impacts that could result from building and operating two or more small modular reactors at the site as presented in the final environmental impact statement. It also summarizes the cumulative impacts and alternatives evaluated.

WHERE CAN I FIND MORE INFORMATION?

- An electronic version of the entire environmental impact statement can be found on the disc included with this summary.
- View an online version at https://www.nrc.gov/reactors/new-reactors/esp/clinch-river.html#feis
- Review a printed copy or disc at
  - Kingston Public Library at 1004 Bradford Way, Kingston, Tennessee 37763
  - Oak Ridge Public Library at 1401 Oak Ridge Turnpike, Oak Ridge, Tennessee 37830
- Contact the U.S. Nuclear Regulatory Commission Environmental Project Manager, Tamsen Dozier, at Tamsen.Dozier@nrc.gov

What Is Being Proposed and Why?

TVA is seeking approval from the NRC of the proposed CRN Site for possible future use in building and operating two or more small modular reactors to demonstrate small modular reactor technology. TVA anticipates use of two or more small modular reactors at the site with a maximum total electrical output of 800 megawatts electric (MW(e)) to demonstrate the capability of small modular reactor technology.

Environmental Impact Statement

An environmental impact statement is required for any Federal action that significantly affects the environment.

An environmental impact statement describes the potential for project effects on the environment and is used to help determine if an action should be permitted.

As part of its evaluation of the environmental aspects of the ESP application, the NRC prepares an **environmental impact statement** (EIS) in accordance with the NRC's regulatory requirements. Even though authorization for construction or operation of new nuclear units is not being sought at this time, the EIS describes the effects on the environment of building and operating two or more small modular reactors at the CRN Site.

Who Is Leading the Review of TVA's ESP Application?

The NRC is the lead Federal agency for reviewing the ESP application. The U.S. Army Corps of Engineers is cooperating with the NRC in the preparation of information in a single EIS for both agencies' decision-making processes. The permit decision from the NRC relates to approving the site as suitable for the construction and operation of nuclear power facilities. Permits from the U.S. Army Corps of Engineers may be necessary to perform building and operation activities that may affect nearby waterbodies. Both agencies must ensure that the **National Environmental Policy Act** process is properly conducted before they can provide approval for their respective Federal actions in connection with this project. Because the necessary environmental reviews conducted by both agencies are similar, having both agencies work together saves time when reviewing an application. Both agencies work together to produce the final EIS, which describes the effects on the environment that could result from building and operating two or more small modular reactors.

National Environmental Policy Act

The National Environmental Policy Act is a national policy for the environment that establishes the basis for considering environmental issues in the conduct of Federal activities.

The Act requires the following:

- Use a systematic, interdisciplinary approach for decision-making about actions that may impact the human environment.
- Inform and involve the public in the decision-making process.
- Consider significant environmental impacts associated with the action.
- Consider alternatives and their impacts on the proposed action.

The environmental impact statement provides the necessary information required under this Act.

The NRC staff (including its contractor staff at Pacific Northwest National Laboratory) and U.S. Army Corps of Engineers staff reviewed TVA's application and environmental information and collectively determined the environmental impact levels. The NRC staff, the U.S. Army Corps of Engineers staff, and contractor experts are known as the "review team."

A detailed description of how the NRC determines whether to issue a permit to TVA is explained in the following sections. After the U.S. Army Corps of Engineers has completed its review of any future permit application in connection with the CRN Site, it will issue a Record of Decision.

What Is the U.S. Nuclear Regulatory Commission's Process for Reviewing an Application for an Early Site Permit?

Once an application has been accepted, two separate reviews are conducted that address safety and environmental impacts.

Exhibit A shows the complete process for an ESP review. The final product from the safety review is a safety evaluation report that details reactor design and safety issues. The final product from the environmental review is an EIS that describes the environmental effects of building and operating a new nuclear plant at the site in question. Both reviews are addressed in a mandatory hearing before a decision is made about whether to grant an ESP. The Atomic Safety and Licensing Board also may conduct a contested hearing if a member of the public or an organization successfully files a petition that raises safety or environmental concerns.

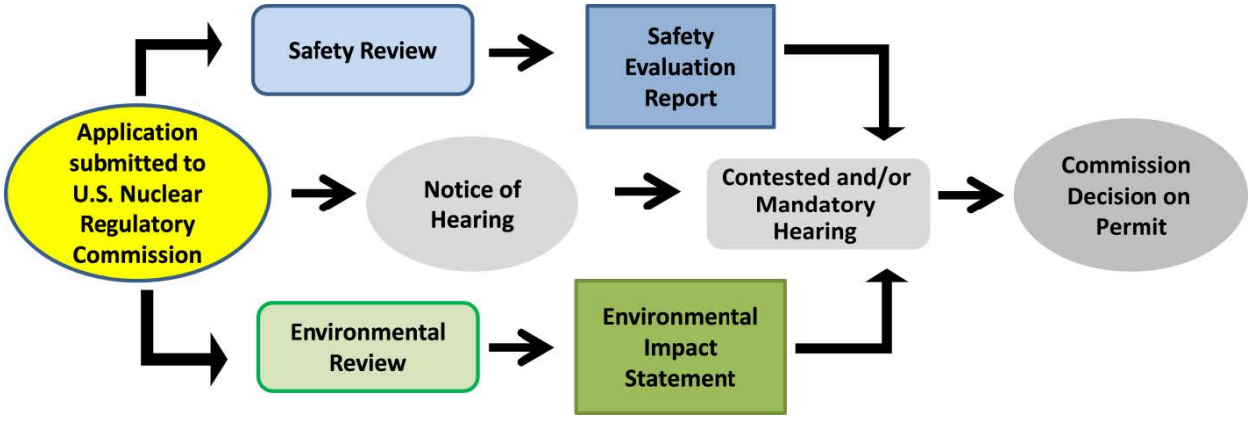

EXHIBIT A. EARLY SITE PERMIT PROCESS

SAFETY REVIEW PROCESS

The purpose of the safety review is to ensure that the site approval complies with NRC regulations and requirements. The review includes an evaluation of certain plant design parameters, site characteristics, siting requirements, quality assurance programs, physical security, and certain major features of emergency preparedness. Additional information included in the analysis describes radioactive waste management and radiation protection.

There are opportunities for public participation during the safety review process. The NRC's analysis is documented in the safety evaluation report.

The **Advisory Committee on Reactor Safeguards** reviews each application and the NRC's safety evaluation report (see Exhibit B), and provides advice to the NRC's five-member Commission about the potential hazards and the acceptability of the proposed site.

Exhibit B shows the steps involved in the safety review process leading up to the mandatory hearing and Commission decision on permit issuance.

Advisory Committee on Reactor Safeguards

The Advisory Committee on Reactor Safeguards is composed of non-U.S. Nuclear Regulatory Commission technical experts. It is structured so that experts representing many technical areas can provide independent advice to the U.S. Nuclear Regulatory Commission.

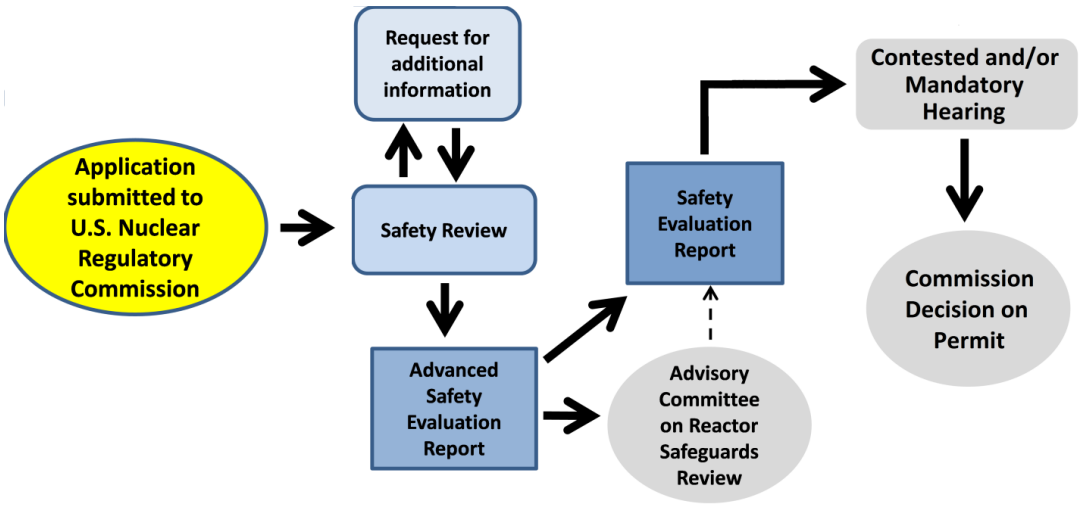

Exhibit B. Safety Review Process

Environmental Review Process

The environmental review includes a careful look at the potential environmental impacts of building and operating new nuclear reactors at the proposed site and the potential mitigation measures for reducing environmental effects. The NRC applies the National Environmental Policy Act and the NRC's Environmental Standard Review Plan, which provides detailed instructions for the review of each environmental subject area (e.g., water, human health, ecology). Environmental effects are explained using descriptions from the Council on Environmental Quality.

The environmental review includes consultation and coordination with local, State, and Federal agencies and Tribal Nations, as well as independent evaluations by the NRC, U.S. Army Corps of Engineers, and contractor experts (i.e., the review team). These experts review the applicant's information about the environment; visit and tour the proposed site; request further information from the applicant as needed; review other published studies and reports; and, when necessary, perform additional analyses to confirm the applicant's conclusions. The review team's analysis of the environmental impacts is documented in the EIS.

In addition, the environmental review includes input from the public by inviting comments before the draft EIS is prepared, and again after the draft EIS is issued. The final EIS contains the review team's responses to public comments submitted during the scoping process and public comments on the draft EIS. Impacts are categorized as **SMALL, MODERATE, LARGE**, or a range of these categories, which are the accepted descriptions from the Council on Environmental Quality. Exhibit C shows a more detailed process flow for NRC's environmental reviews leading up to the Commission decision on the ESP.

IMPACT CATEGORIES

- **SMALL** – Environmental effects are not detectable or are so minor that they will neither destabilize nor noticeably alter any important attribute of the resource.
- **MODERATE** – Environmental effects are sufficient to alter noticeably, but not to destabilize, important attributes of the resource.
- **LARGE** – Environmental effects are clearly noticeable and are sufficient to destabilize important attributes of the resource.

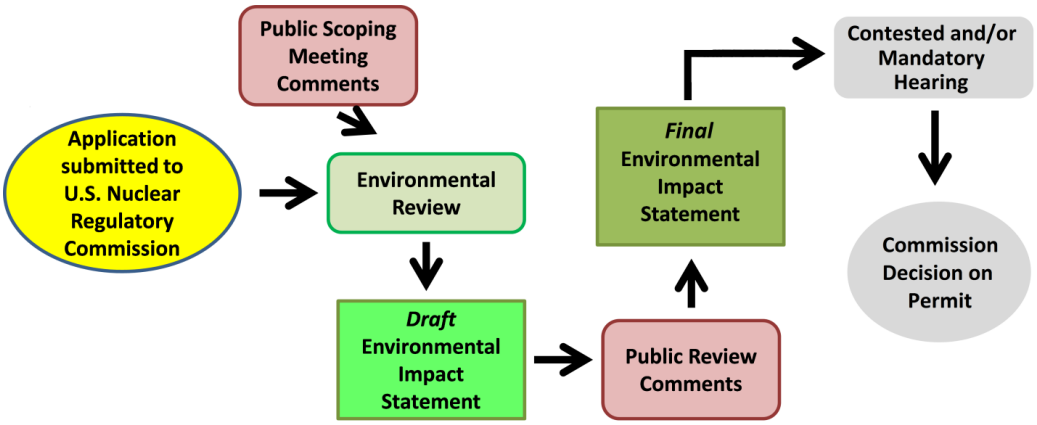

EXHIBIT C. ENVIRONMENTAL REVIEW PROCESS

Commission Review and Decision

A mandatory hearing examining both safety and environmental issues will be conducted by the Commission prior to making a decision about the issuance of an ESP. In addition, a contested hearing may be held by the **Atomic Safety and Licensing Board** panel if a member of the public or organization successfully files a petition that raises safety or environmental concerns about permitting the site. The Atomic Safety and Licensing Board then makes a decision about disposition of the issues raised in a contested hearing, and this decision may be appealed to the Commission.

The NRC's five-member **Commission** makes the final decision about whether or not to grant an ESP.

Atomic Safety and Licensing Board

Members of the Atomic Safety and Licensing Board panel are employees of the U.S. Nuclear Regulatory Commission who act as administrative judges on behalf of the Commission. This panel presides over contested public hearings.

The Commission

The U.S. Nuclear Regulatory Commission has five Commissioners that are selected by presidential appointment. The Commission develops policies and regulations for nuclear reactors and nuclear materials safety, issues licenses, and rules on legal matters.

Description of the Proposed Project

An applicant for an ESP need not provide a detailed design of a reactor or reactors and the associated facilities, but should provide sufficient bounding parameters and characteristics of the reactor or reactors and the associated facilities so that an assessment of site suitability can be made. Consequently, the ESP application may refer to a **plant parameter envelope** as a surrogate for a nuclear power plant and its associated facilities.

Plant Parameter Envelope

A set of plant design parameters that an early site permit applicant expects will bound the design characteristics of the reactor or reactors that might be constructed at a given site. The plant parameter envelope values, therefore, serve as a bounding surrogate for a potential nuclear power plant.

For the Clinch River Nuclear Site ESP, the TVA used a plant parameter envelope approach to estimate the potential environmental impacts of building and operating two or more small modular reactors that have a maximum electric output of 800 MW(e) at the site. TVA developed its plant parameter envelope using information provided by four small modular reactor vendors. The plant parameter envelope for the CRN Site ESP is provided in Appendix I of the EIS.

The CRN Site is located in Oak Ridge (Roane County) Tennessee, approximately 10 miles south of the Oak Ridge urban center; 16 miles west of Knoxville, Tennessee; and 7 miles east of Kingston, Tennessee (Exhibit D). The 935-acre site is not currently used for power-generating

activities. The site is located on the Clinch River arm of the Watts Bar Reservoir, adjacent to the existing U.S. Department of Energy's Oak Ridge Reservation. The primary source of cooling water would be the Clinch River. The ultimate heat sink for the proposed small modular reactors would be the atmosphere, using mechanical draft cooling towers.

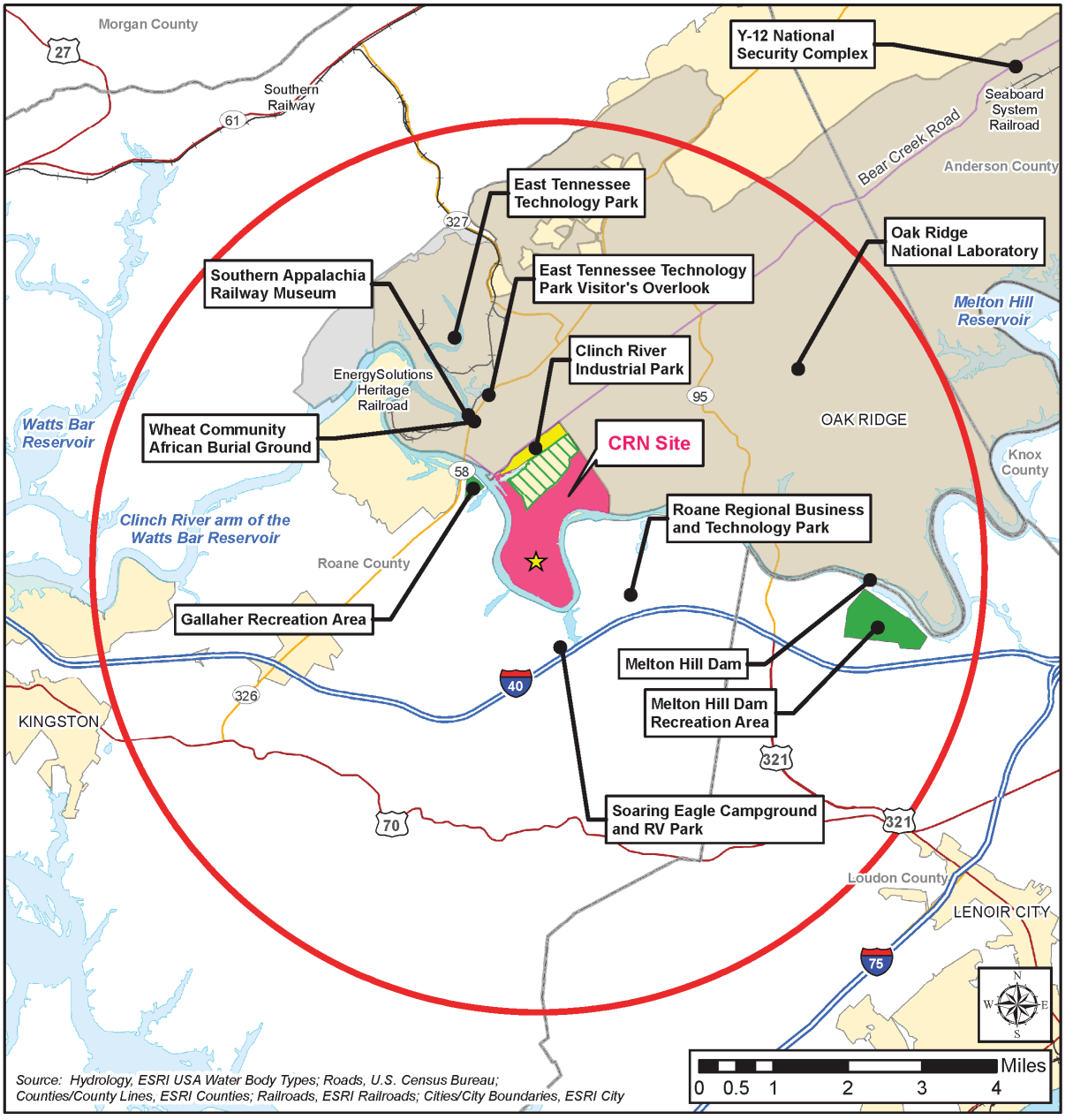

EXHIBIT D. LOCATION OF CLINCH RIVER NUCLEAR SITE

Who Else Did the U.S. Nuclear Regulatory Commission Work with on this EIS?

A large number of Federal agencies; agencies of the States of Tennessee, Alabama, and Kentucky; Tribal and local agencies; and community organizations were contacted during the development of the EIS. These parties provided comments and information used to develop a good understanding of the environmental resources in the area and the potential for environmental impacts.

See Appendix C of the final EIS for more information about the NRC staff's coordination with Federal, States of Tennessee, Alabama, and Kentucky, Tribal, and local agencies. Detailed information about consultations can be found in Appendix F of the final EIS.

In addition to an ESP from the NRC, TVA may need many other environmental permits and certifications potentially required by Federal, State, regional, local, and affected Native American Tribal agencies related to site preparation, construction, and operation of two or more small modular reactors at the CRN Site. Some of these permits are listed in Exhibit E. Appendix H of the final EIS contains a comprehensive list of the permits and requirements TVA would need to build and operate new nuclear facilities.

Agencies and Tribes Contacted for this Project

- Advisory Council on Historic Preservation
- Absentee Shawnee Tribe, Shawnee, Oklahoma
- Alabama-Coushatta Tribe of Texas
- Alabama-Quassarte Tribal Town
- Alabama Department of Conservation and Natural Resources
- Auburn University, Auburn, Alabama
- Anderson County Chamber of Commerce
- Anderson County Economic Development Association
- Anderson County Sheriff's Department
- Cherokee Nation
- City of Knoxville
- City of Oak Ridge, Oak Ridge, Tennessee
- The Chickasaw Nation
- Coushatta Tribe of Louisiana
- Eastern Band of the Cherokee Indians
- Eastern Shawnee Tribe of Oklahoma
- Georgia Department of Natural Resources
- Governor of Tennessee
- Huntsville Utilities
- Jena Band of the Choctaw Indians, Jena, Louisiana
- Kialegee Tribal Town, Wetumka, Oklahoma
- Kentucky State Nature Preserves Commission
- Knox County Government, Knoxville, Tennessee
- Loudon County Economic Development Agency
- Loudon County Government
- Morgan County Government
- Muscogee (Creek) Nation of Oklahoma
- Oak Ridge National Laboratory
- Poarch Band of Creek Indians, Atmore, Alabama
- Roane Alliance
- Roane County Government, Kingston, Tennessee
- Roane County Sherriff's Office, Kingston, Tennessee
- Seminole Tribe of Florida
- Seminole Nation of Oklahoma, Wewoka, Oklahoma
- Shawnee Tribe of Oklahoma, Miami, Oklahoma
- Tennessee Department of Environment and Conservation
- Tennessee Department of Environment and Conservation, Knoxville Field Office, Tennessee
- Tennessee Department of Transportation, Region 1
- Tennessee Division of Archaeology
- Tennessee Emergency Management Agency
- Tennessee Historical Commission
- Tennessee Housing Development Agency
- Tennessee Wildlife Resource Agency
- Thlopthlocco Tribal Town, Okemah, Oklahoma
- Trinity Outreach, Oak Ridge, Tennessee

EXHIBIT E. SOME PERMITS AND AUTHORIZATIONS REQUIRED IF SMALL MODULAR REACTORS WERE TO BE BUILT AT THE CLINCH RIVER NUCLEAR SITE

Federal level	• Aquatic Resource Alteration Permit/Section 401 Water Quality Certification, Tennessee Department of Environment and Conservation • Department of the Army Permit Section 404 and Section 10 Permit, U.S. Army Corps of Engineers • Early site permit or limited work authorization, construction permit and operating license, or combined license, NRC
State level	• Compliance with National Historic Preservation Act, State Historic Preservation Office Tribal Preservation Officer • National Pollutant Discharge Elimination System Permit, Tennessee Department of Environment and Conservation • Aquatic Resource Alteration Permit, Tennessee Department of Environment and Conservation
Local level	• Site Plan Approval, City of Oak Ridge • Building Permit, Roane County

What Are the Concerns of Those Interested?

To learn about the concerns of interested groups and individuals across the country, public comments were invited during a 60 day scoping process through a notice in the *Federal Register*, mailings, and news releases. A draft EIS was issued by the NRC in April 2018 for a 75 day public review and comment period.

Most of the concerns that were within the scope of the EIS centered on the following issues:

- Why aren't alternative energy sources and the need for power evaluated in the EIS?
- What are the project impacts to water resources and wetlands?
- What are the risks from postulated accidental releases of radiation?

PUBLIC PARTICIPATION

- Scoping meetings were held on May 15, 2017, in Oak Ridge, Tennessee, at the Pollard Technology Conference Center Auditorium. All EIS subjects were discussed.
- Scoping comments received and their corresponding responses were included as Appendix D in the draft EIS.
- Two public meetings for comments on the draft EIS were held on June 5, 2018, in Kingston, Tennessee, at the Noah's Event Venue. Comments received and their corresponding responses are included as Appendix E in the final EIS.

How Does the Project Affect the Environment?

The building and operation of two or more small modular reactors at the Clinch River Nuclear Site would affect multiple environmental and regional resources. The EIS considers the potential for impact on each resource.

Land-Use Impacts

The review team concluded that noticeable land-use impacts would result from building the proposed project, primarily because of the conversion of substantial areas of undeveloped naturally vegetated land to a developed condition, and because of the long-term dedication of a 935-acre tract of Federally owned land in an industrial setting that would have otherwise been available for other industrial or urban uses. The barge/traffic area is a portion of the Oak Ridge Reservation immediately north of the CRN Site where TVA proposes to build various road improvements and transportation facilities to serve the new reactors. The review team's conclusion also reflects noticeable land-use impacts from highway interchange reconstruction in the barge/traffic area, as well as brief but locally noticeable land-use impacts from rebuilding overhead transmission line segments, especially where the right-of-way traverses residential landscapes. However, because the changes would take place in an area where energy generation and development projects are common and would not be incompatible with existing land uses, and because the changes would not substantially interfere with anticipated regional growth, the review team does not believe that the land-use impacts would be destabilizing to land resources in the region.

The land-use impacts of operating a new nuclear power plant on the site would be minor. The review team expects that the land-use impacts from operation and maintenance of the affected transmission lines and other offsite impacts would be minor.

Water-Related Impacts

Water-related impacts associated with building a nuclear plant on the CRN Site are similar to impacts that would be associated with the development of any large industrial site. Prior to initiating onsite activities, including any site preparation work, TVA would be required to obtain the appropriate authorizations regulating alterations to the hydrologic environment.

The site preparation and building activities that could affect surface-water quality include land-surface clearing and grading, road improvements, and building structures on the site. Land-surface modifications and road improvements would also occur in the barge/traffic area and offsite transmission corridors. These activities would alter the land surface, the surface cover, and surface-drainage patterns and increase the potential for runoff and erosion.

Work occurring on the shoreline of the Clinch River arm of Watts Bar Reservoir would disturb sediment containing contaminants from historical practices or spills that occurred offsite at upstream locations. Because engineering controls (e.g., best management practices, silt fences/curtains, detention/retention basins, cofferdam) regulated by a combination of Tennessee Department of Environment and Conservation and U.S. Army Corps of Engineers permitting, and the Watts Bar Interagency Agreement, would be in use during building activities, the building-related impacts would be controlled, localized, and temporary.

Most of the water for building activities would be supplied by the City of Oak Ridge Public Works Department. The amount of water used for building would be a small fraction of the available supply. Groundwater would not be used during building activities, but would be extracted as a consequence of dewatering for the power-block excavation. The review team determined that

the effects of dewatering would be limited to the shallow groundwater of the CRN Site and not be noticeable at the locations of offsite groundwater users.

The primary water-related impacts during operation would be associated with the cooling-water system. The review team determined that operation of a plant at the site would consumptively use a small fraction of the average flow in the Clinch River arm of the Watts Bar Reservoir, and that this water use would not noticeably alter the availability of water supply for upstream or downstream users. No groundwater from onsite or offsite sources would be used during operations, and no permanent dewatering system is planned.

The review team determined that the impacts of operations activities on the quality of surface water in the area would be limited for the following reasons:

- Stormwater and plant wastewater discharges would be subject to National Pollutant Discharge Elimination System permit requirements.
- Stormwater best management practices would be implemented, and the stormwater runoff from the site would be small compared to the flow of the Clinch River arm of Watts Bar Reservoir.
- Thermal and chemical mixing zones would be established in the National Pollutant Discharge Elimination System permit for plant wastewater discharges.
- Maintenance dredging is not anticipated, but if needed, would meet permit and oversight requirements.

In addition, the effects of the discharge would be limited due to the mitigating action of a continuous flow of 400 cubic feet per second in the Clinch River arm of the Watts Bar Reservoir provided by the Melton Hill Dam bypass.

Inadvertent spills of fluids such as gasoline have the potential to contaminate groundwater. TVA would implement an Integrated Pollution Prevention Plan at the CRN Site, which would include the use of best management practices to minimize the occurrence of spills and limit their effects. The review team assumed that the holding pond would be designed to preclude discharge to groundwater during operations at the site.

Terrestrial Ecology Impacts

TVA has indicated that site preparation and development of project facilities would be conducted according to Federal and State regulations, permit conditions, and established best management practices. The site preparation and development-related impacts would affect a total of approximately 539 acres of terrestrial habitats, as well as additional lands in various existing transmission line corridors. These impacts would be spatially extensive, noticeably alter the terrestrial ecology of the local landscape, and may affect several adjacent important habitats on the Oak Ridge Reservation. Habitat loss and fragmentation would reduce the availability and quality of mature forest for three Federally listed bat specieis, including the Indiana bat (Exhibit F), northern long-eared bat, and gray bat; as well as the unlisted tri-colored bat and little brown bat, which have been petitioned for listing under the Endangered Species Act; one other bat species considered rare in Tennessee; and forest interior birds.

(Photo courtesy of Andrew King, U.S. Fish and Wildlife Service)

EXHIBIT F. CLUSTER OF HIBERNATING INDIANA BATS

Based on information provided by TVA and the review team's independent evaluation, the review team concluded that the building impacts on terrestrial ecological resources would be noticeable. This impact level is driven primarily by noticeable impacts on upland forests and other terrestrial habitats on and adjacent to the CRN Site and barge/traffic area and associated impacts on wildlife, particularly Federally listed and rare species. TVA stated it would revegetate temporarily disturbed areas. Wetland impacts would be mitigated in accordance with a wetland mitigation plan developed by TVA and reviewed by the U.S. Army Corps of Engineers.

The potential impacts of operating activities at the site and the associated cooling system (mechanical draft cooling towers) on terrestrial resources would be minor. The potential impacts of transmission line operation, including those from electromagnetic fields, and transmission line corridor maintenance on important species and habitats, including wetlands and floodplains, are considered minor, due to their limited spatial extent and assuming related best management practices are implemented.

AQUATIC ECOLOGY IMPACTS

Aquatic habitats and organisms in the Clinch River could be affected by installation of the intake structure, discharge structure, improvements to the barge facility, and installation of a new culvert under the road in the Grassy Creek embayment. The embayment is part of the Clinch River arm of the Watts Bar Reservoir.

Based on its review of TVA's Environmental Report and other relevant information, the review team determined that the impacts of building the project facilities on aquatic resources would be minor. The review team's conclusion reflects the expectation that TVA would minimize the footprint of disturbance and implement appropriate best management practices to minimize sedimentation, erosion, and other disturbances to the reservoir, ponds, and streams. The conclusion also reflects an expectation that TVA would implement mitigation requirements established by the U.S. Army Corps Engineers as part of a Department of the Army permit for

any physical disturbance of streams and other aquatic habitat. The conclusion also rests on an assumption that work on offsite overhead transmission lines would be limited to existing right-of-ways.

The potential impacts of operating activities at the CRN Site and associated facilities would be minor. The potential impacts include temporary and permanent removal of water from the Clinch River, entrainment and impingement of biota during intake operation, thermal and chemical discharges, and maintenance on transmission lines. The review team expects that TVA would adhere to U.S. Environmental Protection Agency regulations on cooling-water intakes and would apply for and follow the requirements of a National Pollutant Discharge Elimination System permit issued by the State of Tennessee.

Socioeconomic Impacts

Physical impacts on workers and the general public from building activities would include those related to noise levels, air quality, existing buildings, transportation resources, and aesthetics. Physical impacts from noise would be mitigated with standard noise mitigation practices required by local ordinances, but still would affect the local residents in close proximity to the site, directly across the Clinch River from the CRN Site. The increased pace of roadway degradation would require more frequent maintenance activities to mitigate the impacts. Impacts on visual aesthetics also would affect those living in close proximity to the site, those transiting local roadways, and recreationists using the Clinch River and other nearby recreation sites. These impacts would be noticeable.

Infrastructure and community services impacts span issues associated with traffic, recreation, housing, public services, recreation resources, and education. Traffic impacts are expected to be localized, temporary, and adverse.

The review team has assessed the activities related to operating a new nuclear power plant at the CRN Site and the potential socioeconomic impacts in the region and economic region. Physical impacts on workers and the general public include those on noise levels and air quality. Other physical impacts apply to damage and soiling to existing structures, transportation infrastructure degradation (roads, water, and rail routes), and aesthetics.

Infrastructure and community services impacts span issues associated with traffic, recreation, housing, public services, and education. Recreational impacts would be higher in close proximity to the proposed site because of impacts on viewsheds from the increased industrial character of the site, which would not be amenable to mitigation.

Environmental Justice Impacts

The review team evaluated the impacts of building activities at the CRN Site on environmental justice populations. The review team did not identify any potential environmental pathways by which the identified minority or low-income populations in the economic region would likely experience disproportionately high and adverse human health, environmental, physical, or socioeconomic effects as a result of building activities.

Based on the preceding analysis, and because the NRC-authorized construction activities represent only a part of the analyzed activities, the review team concluded that there would be no disproportionately high and adverse impacts on minority and low-income populations resulting from building activities at the site.

The review team evaluated the impacts of proposed operations activities at the CRN Site on environmental justice populations. The review team did not identify any potential environmental pathways by which the identified minority or low-income populations within a 50-mile demographic region or in the economic region would likely experience disproportionately high and adverse human health, environmental, physical, or socioeconomic effects as a result of operations activities.

Historic and Cultural Resources

Building and operating a nuclear power plant may affect either known or previously unidentified historic and cultural resources located within the onsite and offsite direct- and indirect-effects **area of potential effects**. The NRC has determined that the direct-effects area of potential effect within its authority is the area at the CRN Site and its immediate environs that may be directly or indirectly affected by activities associated with building and operating a new nuclear power plant. Specifically, the onsite direct-effects area of potential effects is defined as the area comprised of the CRN Site and the associated barge barge traffic area located along Bear Creek Road and SR 58. The onsite indirect-effects area of potential effects is defined as the 0.5-mi area around the lands being cleared of vegetation on the CRN Site.

Building activities occurring in offsite areas also have the potential to impact offsite historic and cultural resources. These activities include installation of a new 69-kV underground line within an existing TVA transmission line right-of-way, upgrades to existing TVA transmission right-of-ways, borrow area developments, and installation of a bypass at the Melton Hill Dam. An offsite area of potential effects has been defined at the Melton Hill Dam.

The review team considered:

- NRC's ongoing consultation with 20 American Indian Tribes and the Tennessee Historical Commission
- TVA's executed Programmatic Agreement describing its ongoing National Historic Preservation Act (NHPA) Section 106 compliance, including commitments to avoid, minimize, mitigate, and resolve adverse effects on National Register of Historic Places (NRHP)-eligible resources that cannot be avoided and NHPA and Native American Graves Protection and Repatriation Act inadvertent discovery and notification provisions
- potential irretrievable damage to an unknown number of 16 NRHP potentially eligible archaeological sites, 1 NRHP-eligible archaeological site, and deeply buried archaeological deposits if in situ stabilization is not possible

Areas of Potential Effects

A geographic area in which an action may directly or indirectly cause alterations in the character or use of historic properties, if such properties exist.

- potential impacts on the NRHP-eligible Melton Hill Dam Historic District (Exhibit G) and on other historic and cultural resources that could be located in other offsite areas (i.e., transmission lines and borrow areas).

(Photo courtesy of the TVA)

EXHIBIT G. MELTON HILL DAM

While some impacts that would result from project activities are not within NRC's regulatory authority, the NRC staff has reviewed TVA's NHPA Section 106 compliance activities for all project activities and estimated impacts at the CRN Site. TVA has concluded that its undertaking to obtain an ESP for future demonstration of the suitability of the site for potential future building and operation of two or more small modular reactors has the potential to adversely affect an unknown number of the 16 potentially NRHP-eligible properties and 1 NRHP-eligible site (40RE233). TVA has executed a Programmatic Agreement to address its ongoing NHPA Section 106 responsibilities because specific plans have not been finalized.

METEOROLOGICAL AND AIR-QUALITY IMPACTS

The review team evaluated potential impacts on air quality associated with criteria pollutants and greenhouse gas emissions during CRN Site building activities and determined that the impacts would be minimal.

The review team evaluated potential impacts on air quality associated with criteria pollutants and greenhouse gas emissions from operating a new nuclear power plant at the site. The review team also evaluated potential impacts of cooling-system emissions. In each case, the review team determined that the impacts would be minimal.

NONRADIOLOGICAL HEALTH IMPACTS

The review team evaluated health impacts on the public and workers from the proposed cooling system, noise generated by plant operations, acute and chronic impacts of electromagnetic fields, and transporting operations and outage workers to and from the proposed site. While Tennessee's occupational incidence rates in the "utility operation" sector are slightly higher than the national average, the review team determined the nonradiological impacts of operations on worker health would be minor. Health impacts on the public from noise generated by plant

operations would be minor. Health impacts on the public and workers from disease-causing agents and acute impacts of electromagnetic fields would be minimal. The review team reviewed available scientific literature about the chronic effects of electromagnetic field on human health and found that the scientific evidence regarding the chronic effects of extremely low frequency-electromagnetic field exposure on human health does not conclusively link extremely low frequency-electromagnetic field exposure to adverse health impacts.

Radiological Health Impacts

If small modular reactors at the CRN Site become operational, the sources of radiation exposure from normal operations for plant workers at the site would include exposure from direct radiation, gas and liquid effluent releases, and solid waste temporarily stored onsite. The public, plants, and animals nearby could also receive a radiation dose from the nuclear units through direct exposure, gas effluent releases (breathing or by eating food grown or raised in the vicinity upon which radioactive material dispersed in the atmosphere may have been deposited), and liquid effluent releases (by drinking water or eating aquatic foods where discharged radioactive material became mixed with local surface water and groundwater), as shown in Exhibit H and Exhibit I.

TVA estimated the annual collective total body dose within a 50-mile radius of the CRN Site to be 68 person-rem/yr. These risks are well below NRC safety goals. The review team concluded there would be no observable health impacts on the public from normal operation of the proposed new units.

Nonradiological Waste Impacts

Nonradioactive waste that would be generated, handled, and disposed of include construction debris, spoils, stormwater runoff, municipal and sanitary waste, dust, and air emissions.

Solid, liquid, and gaseous wastes generated during building and operation at the CRN Site would be handled according to county, State, and Federal regulations. County and State standards and regulations for handling and disposal of solid waste would be obtained and implemented. A National Pollutant Discharge Elimination System permit that would include a stormwater pollution prevention plan for surface-water runoff and groundwater quality, and the use of temporary, portable facilities for sanitary waste systems during the construction period would ensure compliance with the Clean Water Act and the State of Tennessee standards.

Discharges to the Clinch River of liquid effluents used for operations, including wastewater and stormwater, would be controlled and limited via a National Pollutant Discharge Elimination System permit. Air emissions from unit operations would be compliant with local, State, and Federal air-quality standards and regulations. The impacts of mixed-waste generation, storage, and disposal during operation of proposed units would be compliant with requirements and standards.

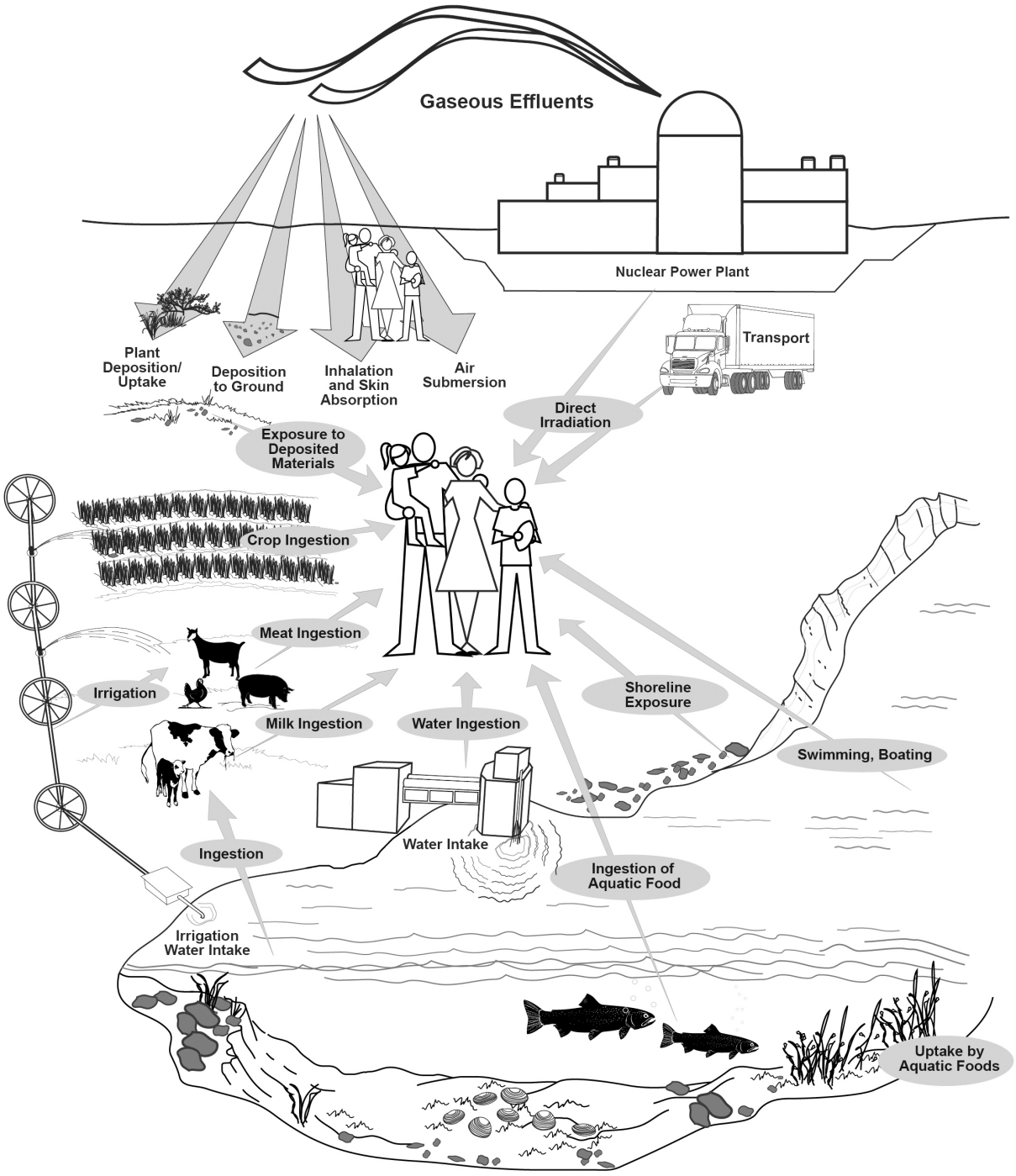

EXHIBIT H. EXAMPLE EXPOSURE PATHWAYS TO HUMANS

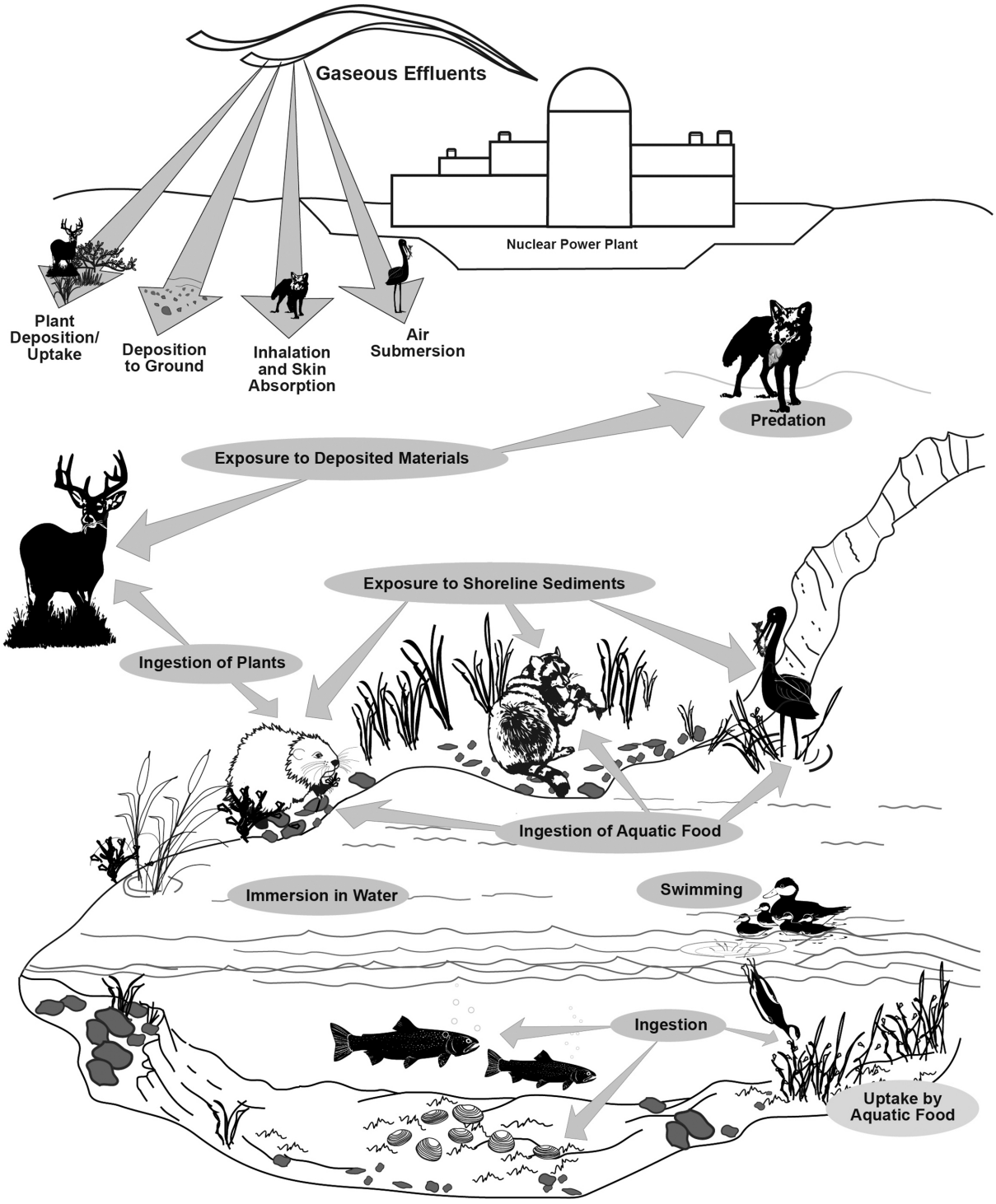

EXHIBIT I. EXAMPLE EXPOSURE PATHWAYS TO WILDLIFE AND PLANTS

Postulated Accidents

The EIS presents the staff's review of TVA's evaluation of the potential consequences of postulated accidents. This review is to demonstrate that a small modular reactor represented by the PPE could be operated at the CRN Site without undue risk to the health and safety of the public. The analysis of postulated accidents is performed under two defined categories: design basis accidents and severe accidents. The design basis accidents analysis in Section 5.11.1 of the EIS examines the accident with the highest offsite consequences, a Loss-of-Coolant Accident. This analysis is conducted to ensure that any of the designs under consideration in TVA's PPE is sufficiently robust to meet the NRC safety criteria.

The severe accident analysis in Section 5.11.2 of the EIS presents the probability weighted consequences (i.e. risks) of a severe accident at the CRN Site using the largest SMR design being considered for the site along with site specific meteorology, population, and land-use data. The NRC staff evaluated impacts for three different plume exposure pathway emergency planning zone boundary assumptions: 1) at the site boundary; 2) a two mile radius; and 3) a ten mile radius. Three risk categories were assessed: 1) human health; 2) economic costs; and 3) land area potentially affected by contamination. As shown in Tables 5-14 through 5-16, the risks of severe accidents would be small for all risk categories for an SMR described by the PPE and also for all of the emergency planning zones considered in the analysis.

Summary of Environmental Impact Levels

Exhibit J lists the impacts associated with the building and operation of small modular reactors at the CRN Site on each resource area. A determination of "NONE" for environmental justice analyses does not mean there are no adverse impacts on minority or low-income populations from the proposed project. Instead, an indication of "NONE" means that while adverse impacts do exist, they do not affect minority or low-income populations in any disproportionate manner relative to the general population. Additional information about resource impacts may be found in the EIS.

Exhibit J. Impacts on Resources

	Building	Operation
Land use	MODERATE	SMALL
Water-related		
Surface-water use	SMALL	SMALL
Groundwater use	SMALL	SMALL
Surface-water quality	SMALL	SMALL
Groundwater quality	SMALL	SMALL
Ecology		
Terrestrial ecosystems	MODERATE	SMALL
Aquatic ecosystems	SMALL	SMALL
Socioeconomic		
Physical impacts	SMALL to MODERATE	SMALL to MODERATE (aesthetics)

EXHIBIT J. IMPACTS ON RESOURCES (CONT'D)

	Building	Operation
Demography	SMALL	SMALL
Economic impacts on the community	SMALL (beneficial to the region)	SMALL (beneficial to the region)
Infrastructure and community services	SMALL (for all categories except traffic) and MODERATE to LARGE (for traffic)	SMALL to MODERATE (recreation)
Environmental justice	NONE	NONE
Historic and cultural resources	MODERATE to LARGE	SMALL
Air quality	SMALL	SMALL
Nonradiological health	SMALL to MODERATE	SMALL to MODERATE
Radiological health	SMALL	SMALL
Nonradiological waste	SMALL	SMALL
Postulated accidents	NA	SMALL
Fuel cycle, transportation, and decommissioning	NA	SMALL

How Can the Impacts Be Reduced?

MEASURES AND CONTROLS TO LIMIT ADVERSE IMPACTS

In its evaluation of potential environmental impacts caused during building and operation of two or more small modular reactors at the Clinch River Nuclear Site, the review team relied on TVA's compliance with the following measures and controls that would limit adverse environmental impacts:

- compliance with applicable Federal, State, and local laws, ordinances, and regulations intended to prevent or minimize adverse environmental impacts (e.g., solid waste management, erosion and sediment control, air emissions control, noise control, stormwater management, discharge prevention and response, hazardous material management)
- compliance with applicable requirements of permits or licenses required for construction of a new nuclear power plant at the CRN Site (e.g., Department of the Army Section 404 Permit, National Pollutant Discharge Elimination System permit)
- compliance with existing TVA processes and/or procedures applicable for environmental compliance activities during building activities at the CRN Site (e.g., solid waste management, hazardous waste management, and discharge prevention and response)
- incorporation of environmental requirements into construction contracts
- identification of environmental resources and potential impacts during the ESP process and the development of revisions to the TVA Environmental Report.

The review team considered these measures and controls in its evaluation of the impacts of plant building and operation. They are fully described in Sections 4.11 and 5.12 of the EIS. For

many environmental resource area, coordination with other Federal, State, or local agencies is required to gain permission to build and operate small modular reactors at the CRN Site. The required permits and certifications are listed in Appendix H of the EIS. Exhibit K provides a summary of some of the planned activities to help minimize environmental effects from building and operating two or more small modular reactors at the proposed site within the plant parameter envelope. Exhibit K is derived from EIS Tables 4-13 and 5-19.

EXHIBIT K. SUMMARY OF PLANNED MEASURES AND CONTROLS TO MINIMIZE ENVIRONMENTAL IMPACTS

Resource Area	Impact Minimization Plan
Land Use	• Use stormwater management plans to control erosion and runoff. • Return temporarily disturbed lands to former uses upon completion of construction. • Offset loss of wetland impacts by mitigation expected to be required by the Department of the Army Permit. • Limit ground disturbances to the smallest amount of area necessary to construct and maintain the plant. • Perform ground-disturbing activities in accordance with regulatory and permit requirements; use adequate best management practices erosion-control measures to minimize impacts. • Restrict soil stockpiling and reuse to designated areas. • Use best management practices and stormwater management plans to control erosion and runoff, minimize clearing, wetlands impacts, and vegetation impacts. • Limit ground-disturbing activities such as vegetation removal to established transmission line corridors.
Water-Related Impacts	• Comply with applicable regulations, permits, and plans. • Grout fractures, cavities, and solution openings in the excavated rock face. Monitor effects of dewatering using groundwater wells. • Establish and implement a stormwater pollution prevention plan. • Use best management practices in addition to TVA, U.S. Army Corps of Engineers, and Tennessee Department of Environment and Conservation controls to protect affected waterbodies. • Apply best management practices as found in stormwater regulations and procedures. • Revegetate construction areas in a timely manner. • Install drainage controls to direct dewatering runoff. • Conduct any excavation along the shoreline in accordance with the terms of the 1991 Watts Bar Interagency Agreement. • Minimize potential spills of chemicals and petroleum materials and hazardous wastes through training, spill prevention plans, and rigorous compliance with applicable regulations and procedures. • Use best management practices to maintain equipment and prevent spills and leaks. • Train appropriate employees in methods for preventing and/or responding to spills. • Establish and implement an Integrated Pollution Prevention Plan for construction practices. • Design cooling towers to limit drift and evaporative water loss.

EXHIBIT K. PLANNED MEASURES AND CONTROLS TO MINIMIZE ENVIRONMENTAL IMPACTS (CONT'D)

Resource Area	Impact Minimization Plan
Water-Related Impacts (cont'd)	• Follow the procedures of the TVA Drought Management Plan during drought conditions. • Manage stormwater in accordance with a site-specific stormwater pollution prevention plan. • Design the diffuser to meet the objectives of maximizing thermal and chemical mixing while minimizing scour and hydrologic modifications. • Limit wastewater discharges and comply with the Tennessee Department of Environment and Conservation (TDEC) National Pollutant Discharge Elimination System permit. • Follow the TDEC-approved Biocide/Corrosion Treatment Plan. • Comply with State water-quality standards and TVA procedures associated with thermal discharges. • Minimize the potential of hazardous materials/waste spills or releases through training and rigorous compliance with the Resource Conservation and Recovery Act of 1976, as amended, and applicable regulations and TVA procedures, and implementation of a site-specific Integrated Pollution Prevention Plan.
Terrestrial Ecosystems	• In temporarily disturbed areas, revegetate and allow natural succession, resulting in a reduction of long-term ecological impacts in these areas. • Restore temporarily disturbed wetland areas to their former conditions as required by wetland regulatory agencies. • To the extent feasible, plan facility construction to take place in previously disturbed areas. • Use best management practices to prevent impacts on adjacent habitats, such as from erosion and runoff of sediment. • To the extent feasible, plan facility locations and construction activities to avoid wetlands. • Limit vegetation removal and construction activities to construction sites, underground transmission line right-of-ways, and access roads. Use established procedures for minimizing erosion and revegetating terrestrial habitats not permanently used for facilities. • Limit ground disturbance to existing right-of-way lands when upgrading offsite transmission lines and when installing the buried 69-kV transmission line. Locate transmission line towers such that wetlands and riparian areas are spanned by the conductors. • Minimize potential impacts through compliance with permitting requirements, best management practices, and TVA procedures. • As appropriate, train employees on how to perform work in a manner that reduces adverse environmental impacts; to the extent feasible, avoid any additional disturbances to sensitive terrestrial or wetland habitats/species. • Identify sensitive areas requiring restrictions on types of vegetation maintenance. • As practical, reseed cleared areas to limit erosion using noninvasive species/native plants, per TVA procedures. • Use licensed operators to apply herbicides. • Comply with the TDEC General Permit for Pesticide Discharges (includes herbicides). • As practicable, use noise suppression/mufflers on vehicles/machinery and other engineering controls such as earthen berms and placing foliage between noise sources and receptors.

EXHIBIT K. PLANNED MEASURES AND CONTROLS TO MINIMIZE ENVIRONMENTAL IMPACTS (CONT'D)

Resource Area	Impact Minimization Plan
Aquatic Ecosystems	• Install cofferdams or similar engineering protective measures around the sites when building or installing the intake and discharge. • Employ best management practices to minimize erosion and sedimentation. • Attempt, to the extent feasible, to tunnel under streams when installing the buried 69-kV transmission line. • Restore any disturbance to streams immediately after work is completed. • Install stormwater drainage systems at large construction sites and stabilize disturbed soils. • Maintain streamside management zones appropriately. • Extend new conductors across waterways within the existing right-of-ways without conducting in-water work or disturbing shorelines to the extent possible. • Minimize potential impacts through compliance with permitting requirements, best management practices, and TVA procedures. • Identify streamside management zones and place restrictions on the type of vegetation management activities performed there. • To the extent feasible, avoid any additional disturbances to sensitive aquatic habitats/species.
Socioeconomics and Environmental Justice	• Manage major high noise construction activities to limit and minimize noise impacts on residences in the vicinity. • Use best management practices for controlling fugitive dust and proper maintenance of construction equipment for controlling emissions. • Train and appropriately protect employees and construction workers to reduce the risk of potential exposure to noise, dust, and exhaust emissions. • To the extent possible, recycle construction wastes and dispose the remaining waste in approved landfills. • Stabilize cleared areas, minimize disturbance and visual intrusion, and remove construction debris in timely manner. • Install traffic controls and roadway modifications and additional turning capacity to mitigate traffic delays; construction workforce will work in up to three shifts to spread additional construction traffic volume over a 24-hour period (one 10-hour shift and occasional night and weekend shifts). • Provide onsite services for emergency first aid, and conduct regular health and safety monitoring. • Stagger shifts, encourage carpooling, and time deliveries to avoid shift change or commute times. • Erect signs alerting drivers of construction and the potential for increased construction traffic. • Use procedures and employee training program to reduce the potential for traffic accidents. • Operate air emissions sources and monitor release of air emissions in accordance with State and Federal regulations, air permit requirements, and TVA procedures. • Include efficient drift eliminators to minimize drift emissions from cooling towers. • Manage thermal discharge from cooling-water systems in accordance with requirements of the TDEC National Pollutant Discharge Elimination System permit and TVA procedures. • Use roadway improvements from construction to offset impacts expected during operations.

EXHIBIT K. PLANNED MEASURES AND CONTROLS TO MINIMIZE ENVIRONMENTAL IMPACTS (CONT'D)

Resource Area	Impact Minimization Plan
Historic and Cultural Properties	• TVA has executed a Programmatic Agreement describing its ongoing NHPA Section 106 compliance, including commitments to avoid, minimize, mitigate, and resolve adverse effects on NHRP-eligible resources that cannot be avoided and commitments to inadvertent discovery and notification provisions. • TVA would conduct operation and maintenance activities in compliance with NHPA Section 106 and would avoid, minimize, or mitigate potential operation-related impacts on historic and cultural resources. TVA would also comply with the NAGPRA, Archaeological Resources Protection Act, Archaeological and Historic Preservation Act, NHPA, American Indian Religious Freedom Act, Executive Orders 13007 (Indian Sacred Sites) and 13175 (Consultation and Coordination with Indian Tribal Governments). • TVA also maintains procedures and management plans that consider impacts on historic and cultural resources during operations. If archaeological resources or human remains are encountered during operations, TVA has NHPA Section 106 and NAGPRA inadvertent discovery procedures requiring stop work and consulting party notifications.
Nonradiological Health	• Comply with Federal, State, and local regulations governing construction activities and construction vehicle emissions. • Comply with Federal, State, and local regulations governing noise from construction activities and increased traffic in the local area. • Comply with Federal and State occupational safety and health regulations; and implement traffic management plan. • Minimize potential impacts through compliance with permitting requirements; best management practices; State, local, and Federal requirements; and TVA procedures. • Minimize night and weekend maintenance operations to reduce noise impacts. • Use mitigation measures to decrease the electromagnetic fields related to the underground transmission line. • Maintain vertical clearance from the ground for overhead transmission lines and safety procedures to prevent direct contact with the underground transmission line.
Radiological Health	• Train construction workers in radiation safety procedures. • Develop work plans that consider methods for reducing radioactive exposures to levels that are as low as reasonably achievable. • Monitor doses received by construction workers to ensure they are within regulatory limits. • Confirm doses from planned releases of radiation are less than the limits prescribed under Title 10 of the *Code of Federal Regulations* (10 CFR) 20.1301 and 40 CFR Part 190. • Implement a radiological environmental monitoring program to monitor specified exposure pathways. • Minimize effluent discharges in accordance with applicable regulations. • Confirm calculated doses for biota other than humans are within National Council on Radiation Protection and Measurements and International Atomic Energy Agency guidelines. • Implement an annual offsite radiological environmental monitoring program to evaluate potential exposures and doses to biota other than humans and the environment.

EXHIBIT K. PLANNED MEASURES AND CONTROLS TO MINIMIZE ENVIRONMENTAL IMPACTS (CONT'D)

Resource Area	Impact Minimization Plan
Nonradioactive Waste	• Manage hazardous and nonhazardous solid wastes according to county, State, and Federal handling and transportation regulations. • Implement recycling and best management practices to minimize waste generation. • Establish procedures for, and perform audits to verify, waste disposal according to applicable regulations such as the Resource Conservation and Recovery Act of 1976, as amended. • Establish a waste minimization program. • Develop and follow a waste minimization plan to reduce the amount of waste that is generated. • Release hazardous air emissions according to limits imposed by the Clean Air Act Amendments of 1977, as amended, the Clean Air Act regulations, and TVA procedures. • Release hazardous water effluents according to limits imposed by the Clean Water Act/Federal Water Pollution Control Act and National Pollutant Discharge Elimination System program and permit requirements, and TVA procedures. • Manage, treat, and dispose of hazardous waste according to Resource Conservation and Recovery Act regulations and TVA procedures. • Generate and dispose of nonhazardous nonradioactive waste according to applicable local, State, and Federal regulations, including the Solid Waste Disposal Act, as amended, 40 CFR Part 261, "Identification and Listing of Hazardous Waste," and TVA procedures. • Perform inspections for compliance with applicable waste management laws and regulations and TVA procedures. • As appropriate, train employees to follow applicable procedures and waste regulations. • Comply with current Waste Minimization Plan developed for existing TVA reactors to address hazardous waste management, treatment (decay in storage), work planning, waste tracking, and awareness training.

What Is the Relationship of this Project with Other Projects in the Area?

Cumulative impacts may result when the environmental effects associated with the proposed project are added to the temporary or permanent effects associated with past, present, and near-future projects. Cumulative impacts can result from the combination of effects that might have been minor by themselves, but become more noticeable when affecting the same resource over a period of time.

The review team developed Exhibit L, which shows the major projects near the CRN Site that were considered relevant in the analysis of cumulative impacts. The review team used this information, the environmental setting discussed in EIS Chapter 2, and impacts described in EIS Chapters 4 and 5 to perform an independent evaluation of cumulative impacts of the proposed action at the CRN Site.

EXHIBIT L. PROJECTS AND OTHER ACTIONS CONSIDERED IN THE CUMULATIVE IMPACTS ANALYSIS FOR THE CLINCH RIVER NUCLEAR SITE

Project Name	Summary of Project
Federal Facilities	
Oak Ridge Reservation	Federally owned 13,547-hectare (33,476-acre) site, comprising government and contractor-operated facilities; includes laboratories, support facilities, environmental cleanup sites, training facilities, and research entities
Oak Ridge National Laboratory	Science and energy U.S. Department of Energy laboratory; supercomputers, neutron science and nuclear energy research; Transuranic Waste Processing Center
Y-12 National Security Complex (Y-12 Complex)	Produces and stores U.S. enriched uranium for nuclear weapons and the Navy
East Tennessee Technology Park	Originally part of the K-25 site (produced enriched uranium during the Manhattan Project), it covers 2,200 acres. Restoration of the area, including environmental cleanup, facility deactivation and decommissioning, waste disposition, and reindustrialization is ongoing
Environmental Management Waste Management Facility	An engineered landfill consisting of six disposal cells; accepts low-level, mixed low-level, and hazardous wastes from Oak Ridge Reservation sites
Uranium Processing Facility	Will produce enriched uranium at the Y-12 Complex at Oak Ridge
Bear Creek Valley Low-Level Waste Landfill	Comprehensive Environmental Response, Compensation, and Liability Act disposal facility on the Oak Ridge Reservation with a potential capacity of 2.2 to 2.8 million cubic yards
Energy Projects	
Nuclear	
Watts Bar Nuclear Generating Station Units 1 and 2	Two operating pressurized water reactors rated at 3,459 MW(t) each
Sequoyah Nuclear Generating Station Units 1 and 2	Two operating pressurized water reactors rated at 3,455 MW(t) each
Coal-Fired	
Kingston Fossil Plant	1,400-MW net-capacity coal-fired plant
Bull Run Fossil Plant	881-MW net-capacity coal-fired plant
Natural Gas-Fired	
University of Tennessee Steam Plant	3.7-MW net-capacity combustion turbine
Tate and Lyle Loudon Facility Co-Generation Plant	Two 33-MW gas turbines and two generators for heat and power
Landfill Methane Gas	
Alcoa/ Maryville/ Blount County Landfill	1-MW capacity, reciprocating engine
Chestnut Ridge Landfill	4.8-MW capacity, reciprocating engine
Meadow Branch Landfill Methane Recovery Project	Landfill gas-collection system; delivered 1,400 MMBtu/day in 2011; 4,000 scfm processing capability
Volunteer Regional Landfill	Landfill gas-collection system; 0.76 Mscf/day collected in 2012

EXHIBIT L. PROJECTS AND OTHER ACTIONS CONSIDERED IN THE CUMULATIVE IMPACTS ANALYSIS FOR THE CLINCH RIVER NUCLEAR SITE (CONT'D)

Project Name	Summary of Project
Solar	
Oak Ridge Solar Park	Installed capacity 49.8 kWp DC, 42 kW AC; annual yield 94,000 kWh
Wind	
Buffalo Mountain Energy Center	Wind turbines with a 27-MW capacity
Hydropower	
Melton Hill Hydroelectric Facility	Two generating units at the Melton Hill Dam with a net capacity of 79 MW upstream on the Clinch River
Fort Loudoun Dam	Four generating units with a net capacity of 162 MW on the Tennessee River
Norris Dam	Two generating units with a net capacity of 110 MW upstream on the Clinch River
Smoky Mountain Hydro	Four hydro dams: Chilhowee (three generating units with a total capacity of 52.2 MW), Calderwood (three generating units with a total capacity of 140.4 MW), Cheoah (five generating units with a total capacity of 140 MW), and Santeetlah (two generating units with a total capacity of 40.4 MW) on the Little Tennessee River
Watts Bar Dam	Five generating units with a net capacity of 182 MW on the Tennessee River downstream of Clinch River
Fontana Dam	Three generating units with a net capacity of 304 MW on the Little Tennessee River
Douglas Dam	Four generating units with a net capacity of 111 MW on the French Broad River
Transmission Lines/Substations	
Rugby-Sunbright Transmission System	Construction of a new Rugby Substation plus 7.25 miles of power line consisting of steel pole structures on a 100-foot right-of-way
Plateau 500-kV Substation	Clearing and grading of the site began in 2015; site completion and linkage to the Wilson-Roane and West Cookeville-Rockwood transmission lines scheduled for 2018
Roane-Pineville 500-kV Transmission Line	70-mile-long transmission line
Mining Projects	
Coal Mining	Miscellaneous surface and deep mining projects
Endsley Quarry	Marble quarry
Lhoist North America	Crushed and broken limestone
Apac Atlantic Inc. Harrison Division Sand Mine 1	Sand and gravel
Vulcan Construction Materials	Concrete, asphalt, aggregates, crushed rock, and lime manufacturing
Aggregates USA	Crushed and broken limestone
Various gas and oil projects	Gas and oil wells

EXHIBIT L. PROJECTS AND OTHER ACTIONS CONSIDERED IN THE CUMULATIVE IMPACTS ANALYSIS FOR THE CLINCH RIVER NUCLEAR SITE (CONT'D)

Project Name	Summary of Project
Parks and Recreation Activities	
Federal	
Manhattan Project National Historical Park (Three Sites)	Includes the X-10 Graphite Reactor Historic Landmark, Buildings 9731 and 9204-3 at the Y-12 Complex, and the site of the K-25 building at the Oak Ridge Reservation
Big South Fork National River and Recreation Area	Consists of 125,000 acres of the Cumberland Plateau; the area offers, hiking, biking, whitewater paddling, horseback riding, rock climbing, camping, and other recreation
Great Smoky Mountains National Park	Includes over 522,400 acres in Tennessee and North Carolina; the park offers camping, hiking, picnicking, fishing, and other recreation
Daniel Boone National Forest	Offers hiking, biking, fishing, rock climbing, boating, target shooting, camping, and picnicking
State	
Frozen Head State Park	Consists of over 24,000 acres of wilderness, included backpacking and day hiking trails
Fort Loudoun State Historic Park	A 1,200-acre National Historic Landmark and site of an early British fortification built in 1756
Norris Dam State Park	Located on the shores of Norris Lake; offers recreational boating, skiing, fishing, hiking, camping, and a museum; consists of more than 4,000 acres
Cove Lake State Park	A 717-acre park that offers scenic nature trails for walking and biking, fishing, and camping
Big Ridge State Park	A 3,687-acre park that offers hiking trails, camping, swimming, and recreation
Cumberland Mountain State Park	A 1,720-acre park offering hiking, swimming, camping, and interpretive programs
Seven Islands State Birding Park	Consisting of 416 acres along the French Broad River, the park is a wildlife refuge and research and educational facility for schools
Hiwassee/Ocoee Scenic River State Park	Consisting of 23 river miles of the Hiwassee and Ocoee Rivers, the park offers rafting, fishing, and camping
Non-Hydroelectric Dams	
Tellico Dam	Flood control and recreation on the Little Tennessee River; the reservoir offers 357 miles of shoreline and 15,560 acres of water surface for recreation
Transportation Projects	
Airports	Several airports including Knoxville Downtown Island, Raby Airpark, Skyranch, Oliver Springs, and McGhee Tyson airports
Oak Ridge Airport	General aviation airport
Chickamauga Lock	Construction of a lock to replace the current transportation lock at Chickamauga Dam
Miscellaneous transportation projects	Road and traffic projects; bridge replacements

EXHIBIT L. PROJECTS AND OTHER ACTIONS CONSIDERED IN THE CUMULATIVE IMPACTS ANALYSIS FOR THE CLINCH RIVER NUCLEAR SITE (CONT'D)

Project Name	Summary of Project
Other Actions/Projects	
Tellico West Industrial Park	5- to 260-acre sites for industrial development
Rockwood Iron and Metal	Former ironworks and metals operations; non-National Priorities List Superfund (Brownfields) site
Smoky Mountain Smelters	Former fertilizer and smelting operations; Superfund National Priorities List
Air emissions sources	
EnergySolutions, LLC Bear Creek Facility	Low-level radioactive waste processing facility
Diversified Scientific Services, Inc.	Hazardous waste-treatment, storage and disposal facility
Materials and Energy Corporation	Mixed-waste processing facility
Carlisle Tire	Tire manufacturer
Toho Tenax America, Inc.	Manufacturer of carbon fibers
Various hospitals and industries that use radioactive materials	Medical and other industrial isotopes
Various wastewater-treatment plant facilities	Sewage treatment
Future Urbanization	Construction of housing units and associated commercial buildings, roads, bridges and rail; and water-treatment and distribution facilities and associated pipelines as described in local planning documents
Manufacturing	
Proton Power	Manufacturer of a renewable energy system that produces hydrogen using biomass and waste
LeMond Composites	Manufacturer of carbon fiber composites
Nuclear Lead Co, Inc.	Manufacturer of lead shielding for the nuclear industry
Manufacturing Sciences Corporation	Manufacturer and processor of technology metals
Canberra	Producer of germanium crystals
Advanced Measurement Technology	Manufacturer of scientific instruments and electronic parts for various radiation detector components
Tate and Lyle Loudon Facility	Manufacturer of corn syrup and fuel alcohol
ArcelorMittal LaPlace, LLC	Manufacturer of steel shapes
Kimberly-Clark Corporation	Manufacturer of paper towels and bath tissue
Kimble Chase Life Science and Research Products	Manufacturer of reusable, disposable, and specialty glassware
Horsehead Corporation	Secondary smelting and refining of nonferrous metals
Clinton Pallet	Manufacturer of pallets
Shawmut Advanced Material Solutions	Manufacturer of laminate
3M Company	Manufacturer
MHF Packaging Solutions, LLC	Manufacturer of metal containers

EXHIBIT L. PROJECTS AND OTHER ACTIONS CONSIDERED IN THE CUMULATIVE IMPACTS ANALYSIS FOR THE CLINCH RIVER NUCLEAR SITE (CONT'D)

Project Name	Summary of Project
PolyOne Corporation	Manufacturer of plastic pellets for use in molding in the automotive, medical, and appliance industries
Doral Steel	Manufacturer of steel
Aisin Automotive Casting Tennessee, Inc.	Manufacturer of aluminum automotive engine parts
Keurig Green Mountain	Production facility
Various Iron Works	Manufacturers of iron, including Capps Crabtree, Pip's, Towe, Volunteer, and Miller
Other industrial and manufacturing facilities	Manufacturing and industrial plants

DISCUSSION OF IMPACT DIFFERENCES

The environmental impact levels of a few of the environmental resource areas were determined to change from minor effects to more noticeable impacts when considered in combination with other past, present, and near-future projects near the CRN Site.

- Surface water use and quality – The extensive past and present modification in the Clinch River basin is the primary driver of the review team's change in impact level. However, the cooling-water discharge by itself would have minimal effects.
- Groundwater quality – Activities on the Oak Ridge Reservation have noticeably altered the groundwater quality. However, because the CRN Site groundwater is hydrogeologically isolated and is a significant distance from most of the Oak Ridge Reservation contamination in Bethel Valley, the temporary excavation dewatering activities at the CRN Site would not result in a noticeable change in the groundwater quality.
- Aquatic ecology – The potential impacts to aquatic ecology from building and operating the new facilities would be minor, but the overall aquatic ecosystem in the Clinch River basin has been extensively disturbed by past impoundment activities.
- Air quality – The national and worldwide cumulative impacts of greenhouse gas emissions have noticeable effects. Small modular reactors at the CRN Site would not significantly contribute to greenhouse gas emissions in the region.

What Alternatives Were Considered?

No Action

Under the no-action alternative the NRC would not issue the ESP. There are no environmental impacts associated with not issuing the ESP, and the impacts predicted in this EIS associated with building and operating two or more small modular reactors at the proposed site or at any one of the alternative sites would not occur. In this context, the no-action alternative would accomplish none of the benefits intended by the ESP process, which would include the following:

- early resolution of siting issues prior to large investments of financial capital and human resources in new plant design and construction
- early resolution of issues related to the environmental impacts of construction and operation of new nuclear units that fall within the plant parameters for small modular reactor nuclear generation units
- the ability to bank sites on which nuclear plants might be located
- the facilitation of future decisions about whether to construct new nuclear power-generation facilities.

Alternative Sites

Candidate areas for siting two or more SMRs were chosen by TVA after considering areas within TVA's Power Service Area using the following criteria:

- seismology considerations
- cooling-water availability
- population density
- proximity to targeted customers

The candidate areas are shown in Exhibit M. Further review of the candidate areas by TVA included locations at which a minimum of 120 contiguous acres were available, preferably in a square configuration. Nearby parcels were evaluated for use as laydown area and parking area that could accommodate the construction of two or more small modular reactors at the alternative site. Because access to a water source is essential, preference was given to sites immediately adjacent to or within 0.5 mile of a primary water source. Easy access to transmission lines (onsite or within 5 miles) and the availability of existing transportation infrastructure were also considered. Ultimately, four candidate sites were chosen for additional site suitability analyses, which resulted in the CRN Site (Oak Ridge Reservation Site 3) being chosen as the preferred site. The remaining three sites examined are listed as alternative sites in the EIS:

- Redstone Arsenal Site 12 in Madison County, Alabama
- Oak Ridge Reservation Site 8 in Roane County, Tennessee
- Oak Ridge Reservation Site 2 in Roane County, Tennessee

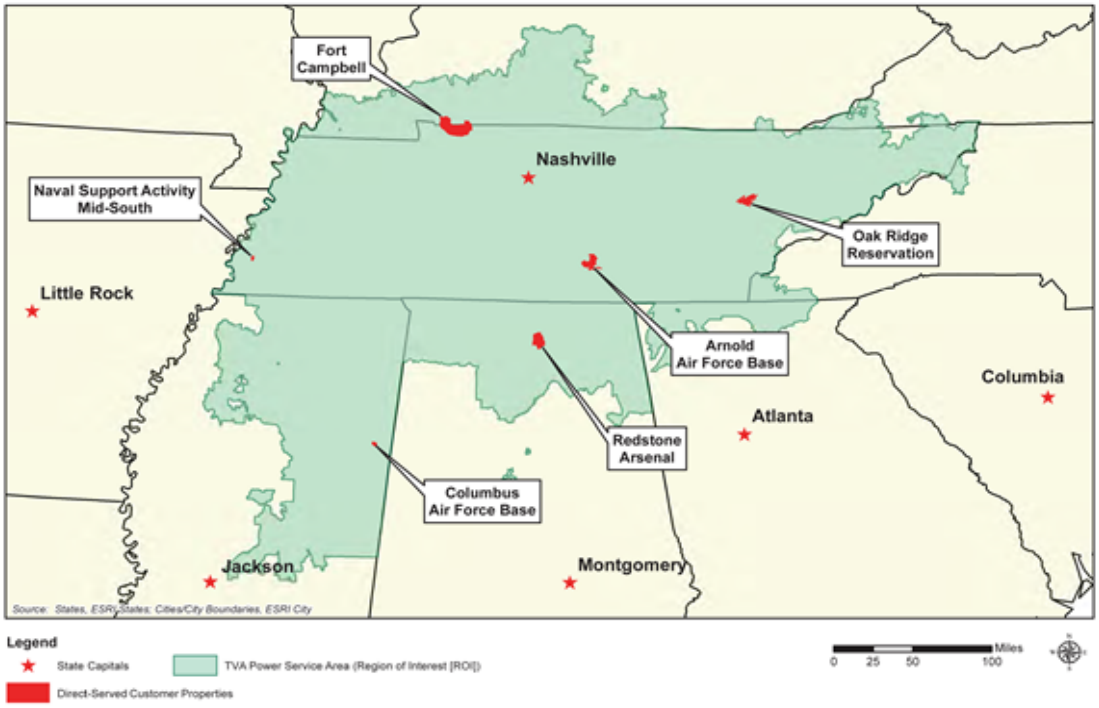

EXHIBIT M. THE REGION OF INTEREST AND CANDIDATE AREAS

Exhibit N summarizes the cumulative impact levels that would be expected if two or more SMRs are constructed at the CRN Site or at any of the alternative sites, The review team concluded that all of the sites were generally comparable, and it would be difficult to state that one site is preferable to another from an environmental perspective. In such a case, the proposed site prevails because none of the alternatives is clearly environmentally preferable.

ALTERNATIVE SYSTEM DESIGNS

The review team considered a variety of alternatives for heat-dissipation systems and cooling-water systems. About two-thirds of the heat from a commercial nuclear reactor is rejected as heat to the environment. The remaining one-third of the reactor's generated heat is converted into electricity. Typical heat-dissipation systems transfer this rejected heat into the atmosphere as evaporation and/or heated discharge water to mix with nearby waterbodies. The majority of the heat dissipation for the proposed plant at the CRN Site would be via evaporation of water in the mechanical draft (wet) cooling towers. The review team considered several alternative heat-dissipation systems, but found none to be environmentally preferable to the proposed mechanical draft wet-tower cooling system.

Cooling-water systems withdraw water (intake) from the Clinch River, circulate the water to remove the heat, and return a slightly reduced volume of water to the receiving waterbody at a higher temperature (discharge). The review team considered various alternatives to the proposed intake system, discharge system, and water supply. The review team did not identify any alternative system designs that were environmentally preferable to the proposed plant system design.

EXHIBIT N. COMPARISON OF CUMULATIVE IMPACTS AT THE PROPOSED CLINCH RIVER NUCLEAR SITE AND THREE ALTERNATIVE SITES

	CRN Site	ORR Site 2	ORR Site 8	Redstone Arsenal Site 12
Land Use	MODERATE	MODERATE	MODERATE	MODERATE
Surface Water Use	MODERATE	MODERATE	MODERATE	MODERATE
Groundwater Use	SMALL	SMALL	SMALL	MODERATE
Surface-Water Quality	MODERATE	MODERATE	MODERATE	MODERATE
Groundwater Quality	MODERATE	MODERATE	MODERATE	MODERATE
Terrestrial and Wetland Resources	MODERATE	LARGE	LARGE	MODERATE
Aquatic Resources	LARGE	LARGE	LARGE	LARGE
Socioeconomics				
Physical Impacts	SMALL to MODERATE	SMALL to MODERATE	SMALL to MODERATE	SMALL to MODERATE
Demography	SMALL	SMALL	SMALL	SMALL
Taxes and Economy	SMALL (beneficial)	SMALL (beneficial)	SMALL (beneficial)	SMALL (beneficial)
Infrastructure and Community Services	MODERATE to LARGE	MODERATE to LARGE	MODERATE to LARGE	MODERATE to LARGE
Environmental Justice	None	None	None	None
Historic and Cultural Resources	MODERATE to LARGE	MODERATE to LARGE	MODERATE to LARGE	MODERATE to LARGE
Air Quality				
Criteria pollutants	SMALL	SMALL	SMALL	SMALL
Greenhouse gas emissions	MODERATE	MODERATE	MODERATE	MODERATE
Nonradiological Health	SMALL to MODERATE	SMALL to MODERATE	SMALL to MODERATE	SMALL to MODERATE
Radiological Health	SMALL	SMALL	SMALL	SMALL
Waste Management	SMALL	SMALL	SMALL	SMALL
Postulated Accidents	SMALL	SMALL	SMALL	SMALL

Cumulative impact determinations were taken from Table 9-14 in the EIS.
CRN = Clinch River Nuclear; ORR = Oak Ridge Reservation.

ALTERNATIVE ENERGY SOURCES

Commission regulations recognize that certain matters need not be resolved at the ESP stage (e.g., an assessment of the benefits, need for power, and energy alternatives) and, thus, may be deferred until an applicant decides to apply for a construction permit or combined license. The EIS does not include an assessment of the need for power or energy alternatives.

What Are the Unavoidable Environmental Impacts?

The National Environmental Policy Act requires that an EIS include information about any negative environmental effects that cannot be avoided if the nuclear plant is built and operated. These impacts are usually the building activities involved with clearing the land, excavating, filling wetlands, installing roads, and dredging. Exhibit O lists the unavoidable environmental impacts from building and operating small modular reactors at the CRN Site. The impacts discussed are based on information presented in Tables 10-1 and 10-2 of the EIS.

EXHIBIT O. UNAVOIDABLE IMPACTS

Environmental Resource	Unavoidable Adverse Impact	Adverse Impacts
Land Use	Long-term dedication of 935 acre tract of land suitable for industrial development. Approximately 327 acres of a total of 494 acres would be permanently converted from naturally vegetated land to industrial use. Thirty acres of a total of 203 acres in the barge/traffic area would be permanently affected by roadway improvements including conversion of naturally vegetated land to transportation use.	MODERATE
Water Use	Water use for building would increase the demand on the City of Oak Ridge water supply system, which obtains water from Melton Hill Reservoir. Temporary excavation dewatering is not expected to impact groundwater use. The maximum surface-water consumptive use would be less than 1 percent of the average flow rate in the Clinch River arm of the Watts Bar Reservoir adjacent to the site. Groundwater would not be used during operations.	SMALL
Water Quality	Local and temporary increase in sediments in water from increased erosion and construction stormwater runoff and discharge of excavation dewatering product and spills. Underwater excavation would result in minor localized changes in flow patterns along the reservoir bottom due to differences in bottom contours at the edges of the excavation zone, as well as temporary suspension of sediments during excavation. Use of heavy equipment would introduce the possibility of petroleum and other chemical spills. Normal facility operations result in the discharge of small amounts of chemicals and radioactive effluents. Discharge of cooling water would result in a thermal plume to the Clinch River arm of the Watts Bar Reservoir. Thermal impacts would be within limits established in the National Pollutant Discharge Elimination System permit.	SMALL

EXHIBIT O. UNAVOIDABLE IMPACTS (CONT'D)

Environmental Resource	Unavoidable Adverse Impact	Adverse Impacts
Terrestrial and Wetland Resources	Permanent loss of approximately 357 acres of habitat on the CRN Site and in the barge/traffic area. Temporary loss of 182 acres on site and in the barge/traffic area. Total habitat disturbance on the site and in the barge/traffic area of 539 acres. Filling of approximately 1.8 acres of wetland on the CRN Site and in the barge/traffic area. Mitigation could reduce impacts. Clearing of trees and other vegetation and grading could cause mortality or displacement of wildlife, including Federally listed bat species. Construction noise may cause some wildlife to avoid some habitats near the source. This impact may occur intermittently throughout the construction phase. Birds may occasionally collide with tall construction equipment and suffer mortality. A total of approximately 210 acres of existing right-of-way lands would be disturbed to install the offsite portion of the 69-kV underground transmission line. Minor potential cooling-tower salt deposition impacts would occur on early successional vegetation near the towers. Minor potential noise impacts would occur on wildlife near the towers. There would be a minor risk of avian and bat collisions with mechanical draft cooling towers or with new transmission lines. There would be a minor risk to wildlife from vegetation maintenance in new transmission line corridors.	MODERATE
Aquatic Resources	There would be removal of a perennial stream, an intermittent stream, 2 ponds, and 12 ephemeral streams. Minimal or no unavoidable adverse impacts on the Clinch River arm of the Watts Bar Reservoir from installing the intake at the reservoir's edge and the discharge to the reservoir bottom. These actions may cause the loss of some benthic aquatic organisms and temporary degradation of habitat, as well as permanent loss of limited areas of habitat at the intake and discharge structures. Installation of underground transmission line would involve crossing streams and may cause temporary disturbance of aquatic habitats in short stream segments within the right-of-way. Routine facility operations result in discharge of small amounts of chemical and thermal effluents to the Clinch River arm of the Watts Bar Reservoir that could affect aquatic life over the operational life of the Clinch River Nuclear plant. Few or no unavoidable adverse impacts. Entrainment or impingement at the water intake results in mortality and injury to various life stages of fish and other aquatic organisms. A relatively small proportion of eggs, larvae, or adults of relatively common species of aquatic species would be impacted by entrainment or impingement.	SMALL

EXHIBIT O. UNAVOIDABLE IMPACTS (CONT'D)

Environmental Resource	Unavoidable Adverse Impact	Adverse Impacts
Socioeconomic		
Physical	Increased levels of temporary and localized noise, exhaust emissions, and fugitive dust associated with construction activities. Localized visual intrusion of building activities. The addition of new cooling towers and new reactor facilities at the site, and related operations causing cooling-tower steam plumes.	SMALL to MODERATE
Demography	None	SMALL
Tax and Economic Impacts	None	SMALL (beneficial)
Infrastructure and Community Services	Substantially increased traffic on local roadways during the period of peak construction employment (Months 42–47). Increased demand for housing, infrastructure, public services, and education resources on a short-term basis from the influx of construction workers and families. Cooling-tower plumes would noticeably affect the aesthetic qualities from viewpoints in Anderson and Roane Counties. Recreational impacts would be adverse and not amenable to mitigation.	SMALL (for all categories except traffic) to MODERATE to LARGE (for traffic)
Environmental Justice	None	None
Historic and Cultural Resources	Building activities could result in unavoidable adverse impacts on 16 potentially National Register of Historic Places (NHRP)-eligible archaeological resources, one NRHP-eligible archaeological resource (40RE233), deeply buried archaeological deposits, and one NRHP-eligible Melton Hill Dam District. Unavoidable adverse impacts are possible during the life of the operating license if inadvertent discoveries result in adverse effects on places containing human remains or on historic properties.	SMALL to LARGE
Air Quality	Temporary emissions from construction equipment firing fossil fuels, fugitive dust from soils disturbance and moving of soils, and workforce motor vehicles. Diesel generators and other fossil fuel combustion equipment (during emergency and maintenance operations, and the auxiliary building) would contribute to air emissions. Cooling towers would emit plumes.	SMALL
Nonradiological Health	Dust emissions, noise, occupational injuries, traffic accidents. Impacts from construction activities to worker health. Health risks to workers are expected to be dominated by occupational injuries and would be minor. Health impacts on the public from noise generated by plant operations would be noticeable.	SMALL to MODERATE (for noise)

EXHIBIT O. UNAVOIDABLE IMPACTS (CONT'D)

Environmental Resource	Unavoidable Adverse Impact	Adverse Impacts
Radiological Health	Radiation exposures to construction workers that would be within regulatory limits and as low as is reasonably achievable (ALARA). Small radiation doses to members of the public below NRC and U.S. Environmental Protection Agency standards. ALARA doses to employees; adherence of the mitigation measures to applicable regulatory standards would reduce this exposure to ALARA. Non-human biota doses less than National Council on Radiation Protection and Measurements and International Atomic Energy Agency guidelines. The mitigation measures would reduce the risk of radiological impacts. However, there would be unavoidable long-term commitments of land for an independent spent fuel storage installation and geological repository. Long-term commitments of land for radwaste disposal.	SMALL
Nonradioactive Waste	Minor decrease in the available capacity of waste-treatment and disposal facilities. Minor stormwater, wastewater, and atmospheric discharges. Increased consumption of landfill space for disposition of wastes; increased consumption of fuels for the transportation and disposition of wastes.	SMALL
Fuel Cycle, Transportation, and Decommissioning	Small impacts from fuel cycle as presented in Table S-3, 10 CFR Part 51. Small impacts from radon and technetium-99 releases. Small radiological doses that are within the NRC and Department of Transportation regulations from transportation of fuel and radioactive waste. Small impacts from decommissioning as presented in NUREG–0586.	SMALL

What Are the Irreversible and Irretrievable Commitments of Resources?

The term “irreversible commitments of resources” refers to environmental resources that would be permanently changed and could not be restored at some later time by the building or operation activities authorized by the NRC and U.S. Army Corps of Engineers permitting and licensing decisions. Exhibit P lists the irreversible environmental resources from building and operating small modular reactors at the CRN Site. The term “irretrievable commitments of resources” refers to environmental resources that would be used or consumed by the new units in such a way that they could not be recycled or restored for other uses. The review team expects that the use of building materials in the quantities needed for the proposed project would be irretrievable, but would be of small significance with respect to the availability of such resources.

EXHIBIT P. IRREVERSIBLE COMMITMENTS

Environmental Resource	Irreversible Commitment
Land Use	Land committed to the disposal of radioactive and nonradioactive wastes is committed to that use and cannot be used for other purposes.
Water Use and Quality	No irreversible commitments of water resources duringbuilding activities. Approximately 12,808 gallons per minute would be irreversibly lost during operation from the Clinch River and would not be available to downstream users.
Terrestrial and Aquatic Biota	Building activities would permanently convert some portions of terrestrial and aquatic habitats on the site and in the barge/traffic area, which overall would permanently adversely affect the abundance and distribution of local terrestrial species.
Socioeconomics	No irreversible socioeconomic commitments.
Historic and Cultural Resources	Building activities would permanently damage an unknown number of historic and cultural resources located at the CRN Site.
Air Quality	The review team expects no irreversible impacts on air quality because all releases would be made in accordance with duly issued permits.

When Will the U.S. Nuclear Regulatory Commission Decide?

After considering the environmental impacts of the proposed action, the review team's recommendation to the Commission is that the ESP be issued as proposed. This recommendation was determined using the criteria in Exhibit Q.

The Commission will make a decision about whether to issue the ESP following the issuance of the final EIS and final safety evaluation report and the conclusion of the hearing process.

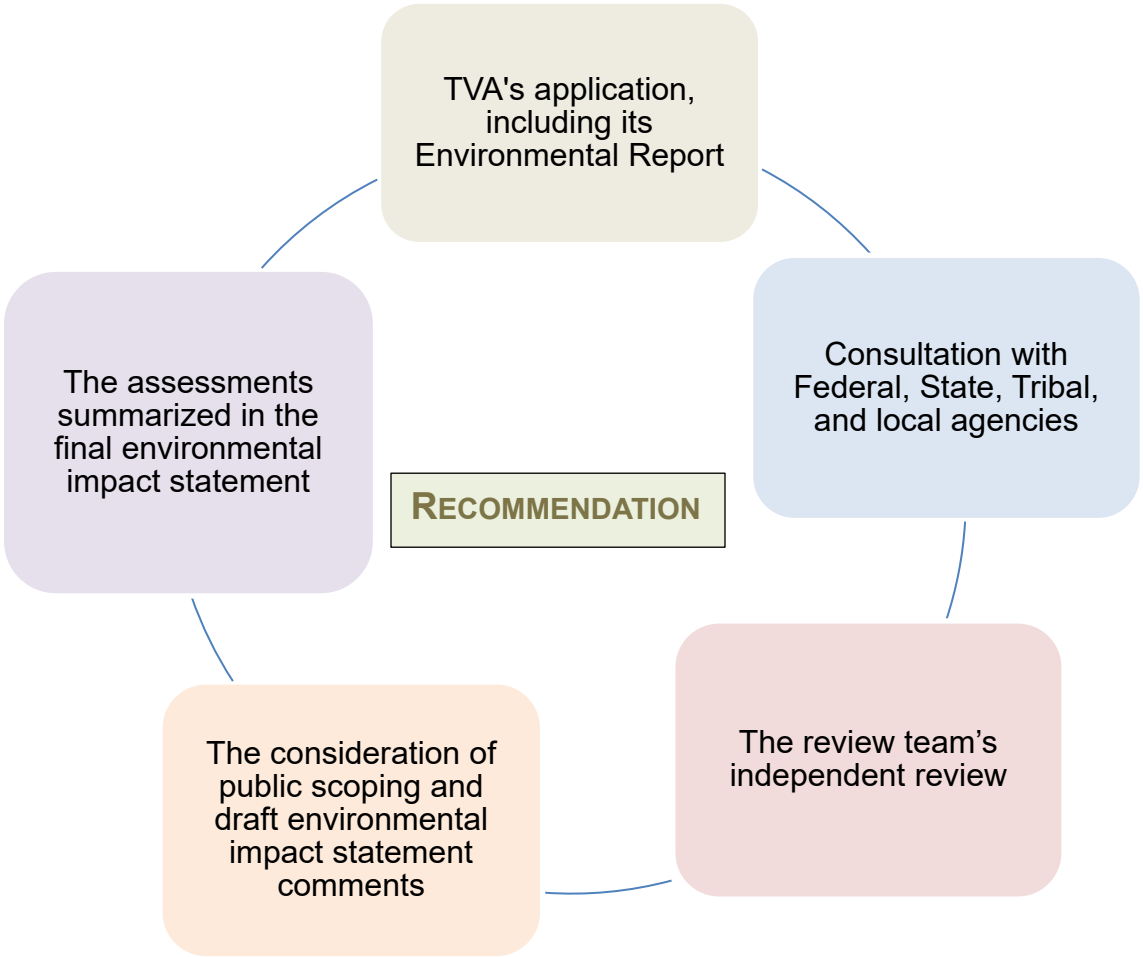

EXHIBIT Q. BASIS OF THE REVIEW TEAM'S RECOMMENDATION

What Is in the EIS?

Chapter 1 – Introduction

This introductory chapter defines the proposed action and the purpose of and need for the proposed action and provides a brief outline of the NRC and U.S. Army Corps of Engineers environmental review processes.

Chapter 2 – Affected Environment

This chapter describes the location of the CRN Site and the existing conditions at the site and surrounding area and provides the "baseline" for the analysis.

Chapter 3 – Site Layout and Plant Design

This chapter describes the proposed site layout and the key plant characteristics used for the impact analysis of the proposed actions.

Chapter 4 – Environmental Impacts of Construction

This chapter describes the potential impacts from building the CRN Site and the safeguards and controls that would limit the adverse impacts of building the new units.

Chapter 5 – Environmental Impacts of Operation

This chapter examines the potential impacts from operating CRN Site and the safeguards and controls that would limit the adverse impacts during operation over the 40-year license period.

Chapter 6 – Fuel Cycle, Transportation, and Decommissioning

This chapter addresses the environmental impacts from (1) the uranium fuel cycle and solid waste management, (2) the transportation of radioactive material, and (3) the decommissioning of the CRN Site.

Chapter 7 – Cumulative Impacts

This chapter describes the cumulative impacts that may result when the effects of building and operating the proposed project are added to, or interact with, other past, present, and reasonably foreseeable future actions on the same resources.

Chapter 8 – Need for Power

The EIS for an ESP does not address the need for power if the application did not address the need for power. TVA's ESP application did not address the need for power.

Chapter 9 – Alternatives

This chapter contains the evaluation of the no action alternative, site location alternatives, and nuclear plant design alternatives.

Chapter 10 – Conclusions and Recommendations

This final chapter provides the staff's preliminary recommendation about whether the ESP should be issued to TVA.

What Are the Next Steps?

A mandatory hearing with the Commission will be held after both the final environmental impact statement and the final safety evaluation report are issued. As of the publication of this Reader's Guide, the publication of the final safety evaluation report is scheduled for June 2019. For additional information, please contact Tamsen Dozier, Environmental Project Manager at tamsen.dozier@nrc.gov or visit the NRC's Clinch River Nuclear Site website at http://www.nrc.gov/reactors/new-reactors/esp/clinch-river.html.

(Courtesy of NRC Flickr)

April 2019