TVA's New Nuclear Program

Exploring new advanced reactors and small modular reactor technologies

Small modular reactor designs are those with an electric generating capacity up to 300 MW

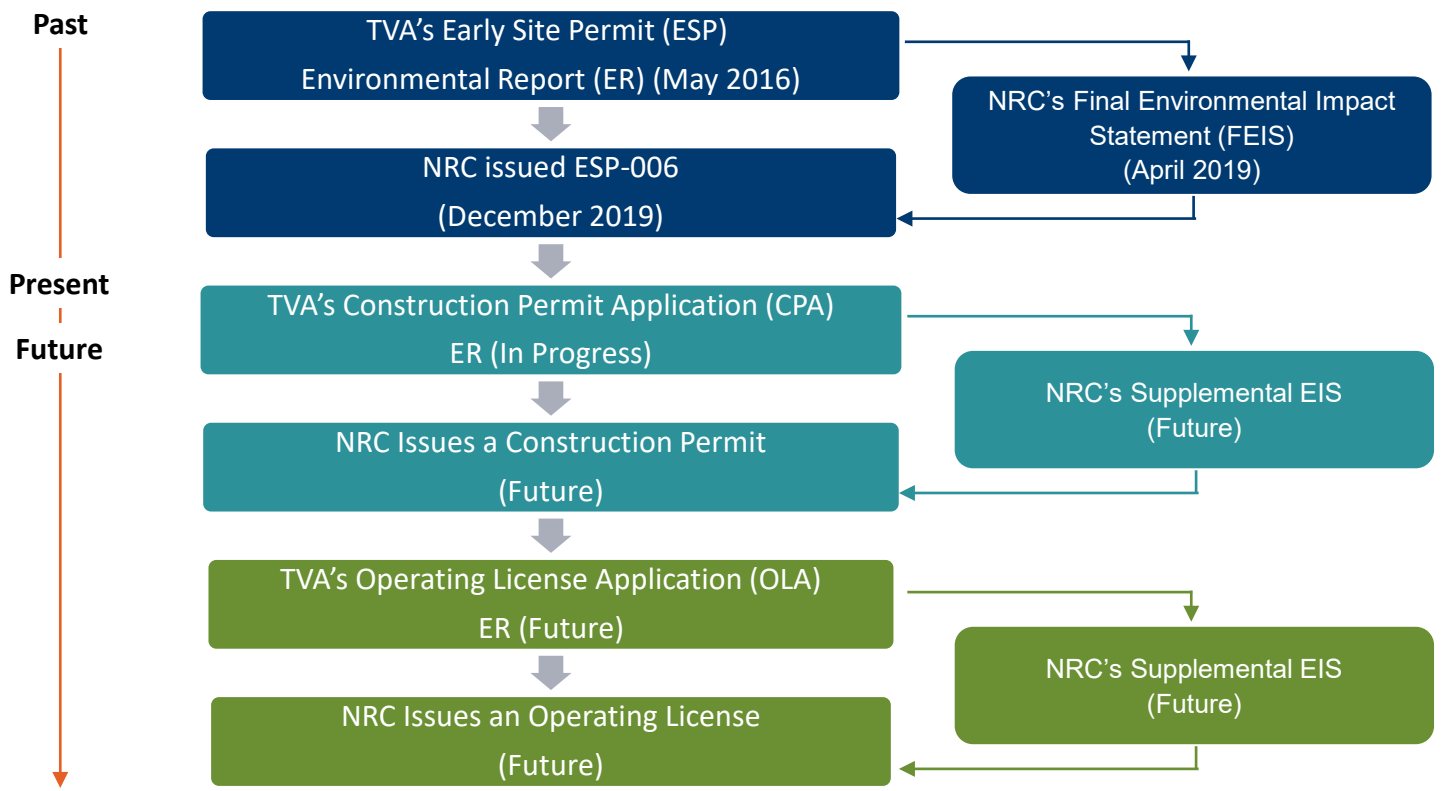
Small modular reactor designs are based on existing commercial technologies

The smaller size enables components to be shipped to the site by rail or truck, allowing more of the construction to take place in factories.

Potential Advantages of New Nuclear Technologies

- Improved safety and security
- Reduced construction time
- More standardization
- Small footprint; more site options
- Lower financing costs

CRN Site Project Licensing Activities



GE-Hitachi BWRX-300

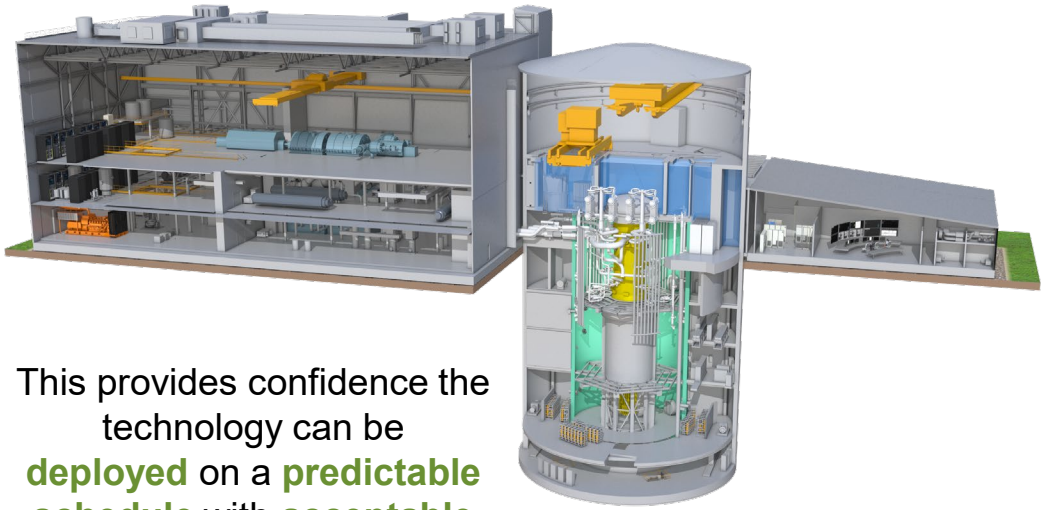
BUILT ON PROVEN TECHNOLOGY

- Thermal fission boiling water reactor (BWR)
- Light-water-moderated
- Cooled with natural circulation
- Designed with passive safety systems.

TVA identified GEH's innovative BWRX-300* reactor design as the most promising for near-term deployment.

BENEFITS OF THIS DESIGN INCLUDE

- **10** GENERATIONS OF DESIGN HISTORY
- EXISTING SUPPLY CHAINS
- AMERICAN FUEL
- NRC LICENSING PATHWAY



This provides confidence the technology can be **deployed** on a **predictable schedule** with **acceptable risk**.

*TVA has not yet decided to deploy an SMR. Any decisions will be subject to support, risk sharing, required internal and external approvals, and completion of all necessary environmental and permitting reviews

Clinch River Nuclear Site History

MANHATTAN PROJECT TO TVA'S POTENTIAL FIRST SMALL MODULAR REACTOR*

1940

1942
Property acquired by the U.S. Army Corp of Engineers as part of the 59,000-acre Oak Ridge Complex for The Manhattan Project.

1950

1947
Property transferred to civilian control under the Atomic Energy Commission (AEC).

1960

1959-1965
In three actions, the Bureau of Budget transferred several tracts from AEC to TVA for the Melton Hill Project and other purposes.

1970

1980

1982
TVA/DOE sign a license agreement for site preparation activities on about 600 acres for the Clinch River Breeder Reactor (CRBR) Project.

1983
CRBR site preparation work ends – about 240 acres impacted. (Pictured Below)

1990

1989
TVA/DOE license agreement from 1982 terminated upon completion of agreed upon site restoration activities.

2000

2010

1989-2022
Site managed by TVA and incorporated into various TVA land planning and management documents.

2020

Feb 2022
TVA Board authorizes up to $200M to explore advanced nuclear at the Clinch River Nuclear site.

CLINCH RIVER BREEDER REACTOR PROJECT, 1983

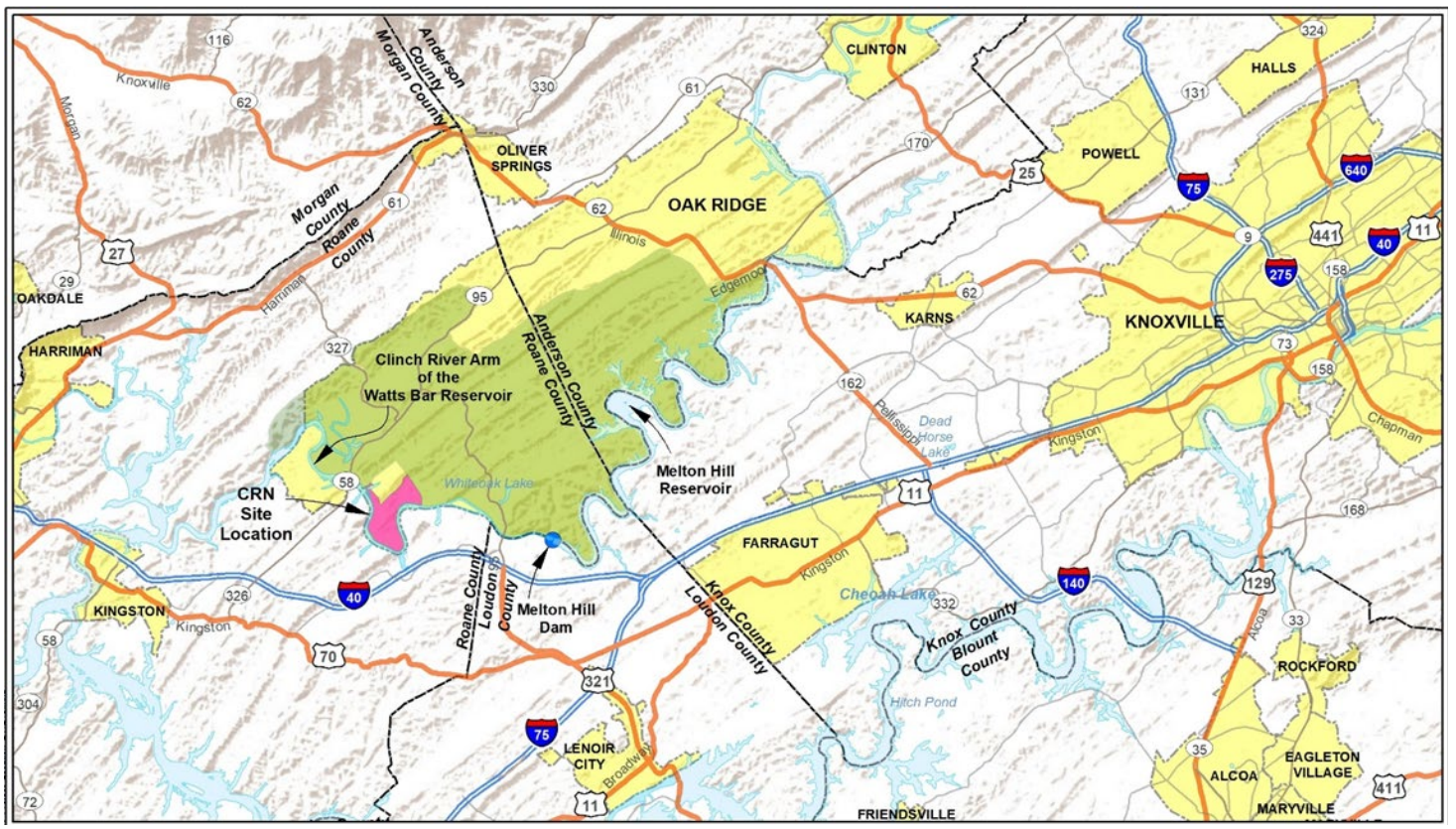
* TVA has not yet decided to deploy an SMR. Any decisions will be subject to support, risk sharing, required internal and external approvals, and completion of all necessary environmental and permitting reviews

Deliberative and Pre-decisional

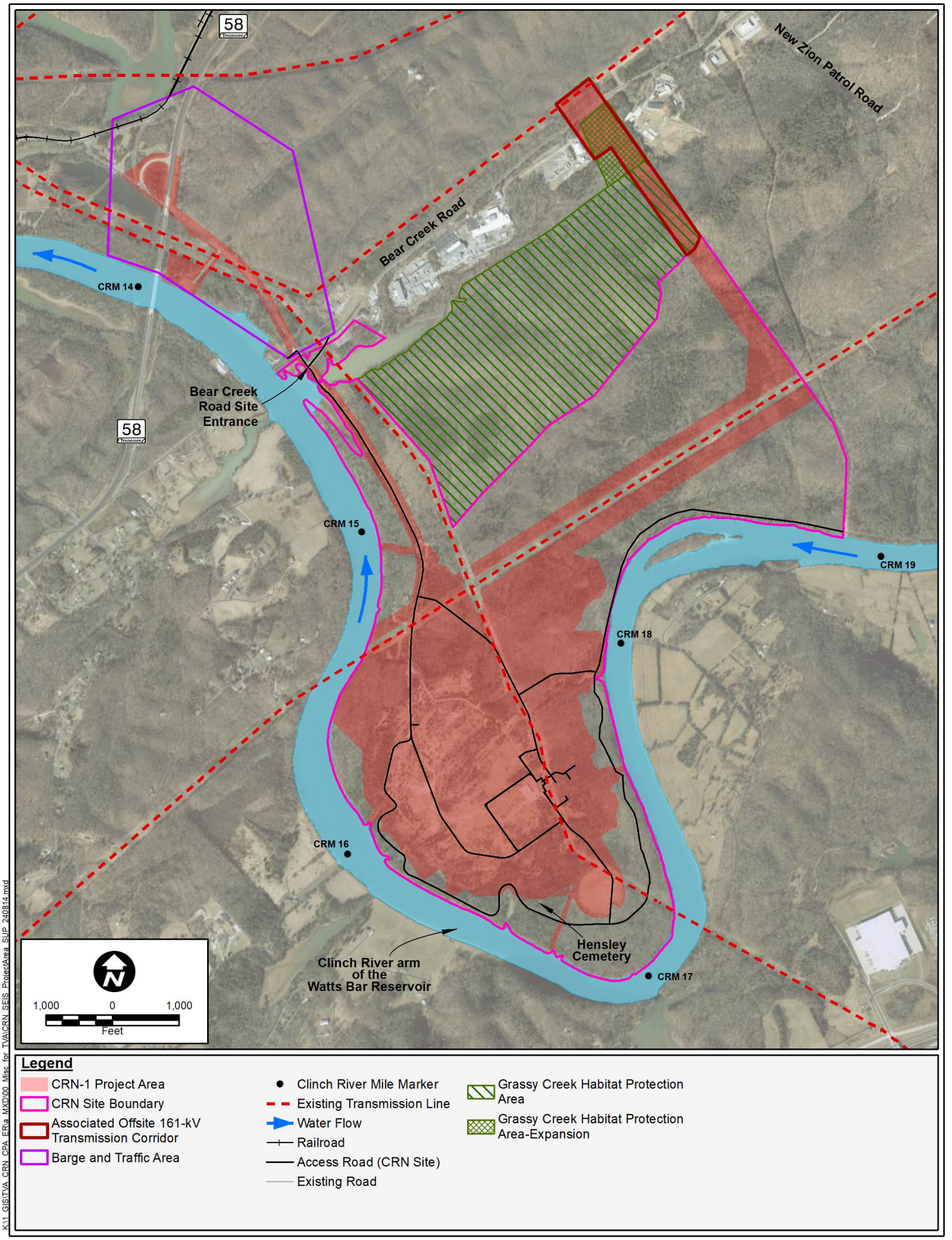
TVA TENNESSEE VALLEY AUTHORITY

Project Purpose and Need

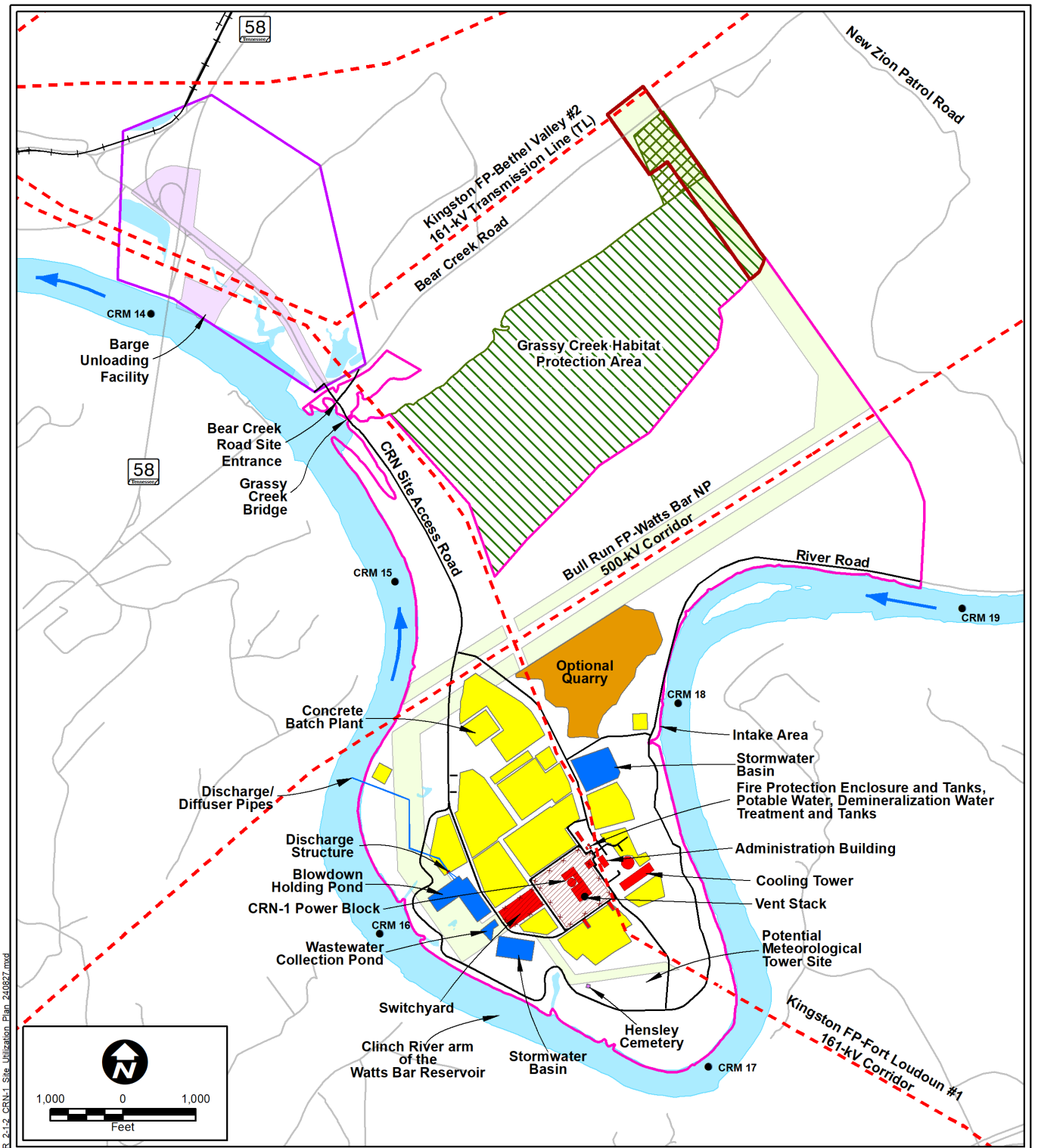
- The primary purpose of the proposed action is to demonstrate the feasibility to license, construct, and operate a Small Modular Reactor (SMR) technology at the CRN Site.
- The proposed action is needed to:
  - support the recommendations outlined in TVA's 2019 Integrated Resource Plan (IRP) to evaluate emerging nuclear technologies, including SMRs, as part of technology innovation efforts aimed at developing future electricity generation capabilities, and
  - to enable TVA's Board of Directors to consider next steps as part of TVA's efforts to explore advanced reactor options that could be used to help TVA maintain a firm, fixed, clean, and reliable power supply.



The CRN Site is located on 935-acres of TVA land in Oak Ridge, Roane County, Tennessee adjacent to US Department of Energy Oak Ridge Reservation.



Alternative B1 – CRN-1 Disturbance Area



Legend

- CRN Site Boundary
- Associated Offsite 161-kV Transmission Corridor
- Barge and Traffic Area
- BTA Limits of Disturbance
- Grassy Creek Habitat Protection Area
- Grassy Creek Habitat Protection Area-Expansion
- Onsite 161-kV Corridor
- Existing Transmission Line
- Clinch River Mile (CRM)
- Water Flow
- Railroad
- Discharge Pipe
- Access Road (CRN Site)
- Existing Road
- Existing Water Feature
- Fenced Area (17.5 acres)
- Plant Infrastructure (8.6 acres)
- Optional Quarry (40.2 acres)
- Construction/Operational Support Area (100.7 acres)
- Pond (14.8 acres)
- Cemetery

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Proposed CRN-1 Site Layout

Deliberative and Pre-decisional

TVA TENNESSEE VALLEY AUTHORITY

Tiering from the CRN Programmatic EIS (PEIS)

- The PEIS used a bounding approach to evaluate impacts from creating an Advanced Nuclear Reactor Technology Park, using plant parameter envelope (PPE) analysis, based on a range of reactor types with varying levels of design maturity, using the process established in TVA's Early Site Permit Application to the NRC in 2019.
- Analysis of environmental impacts based on a bounding approach encompasses a maximum of potential impacts resulting from implementing each of the alternatives.
- Federal agencies may rely on PEIS analyses for 5 years without conducting additional review unless there are substantial new circumstances or information about the significance of adverse effects that affect the analysis.

Supplemental EIS (SEIS) Data Review

- For the SEIS TVA reviewed new information that differed from that considered in the Programmatic EIS
- New information included information about CRN-1 (one BWRX-300) or new data about environmental conditions at the CRN Site
- After review, the new information was determined to be either:
    - Consistent – information that was effectively the same or substantially similar to that considered in the Programmatic EIS – this information was incorporated by reference in the SEIS.
    - Notably different – information that was new and not previously considered or substantially different from that considered in the Programmatic EIS – this information was evaluated in the SEIS

Alternatives Considered in the Supplemental EIS:

- **A** – No Action Alternative
- **B1** – Construction, Operation, and Decommissioning of CRN-1

Analyses Incorporated by Reference from the PEIS

- Geology and Soils
- Meteorology, Air Quality, and Climate Change
- Noise
- Socioeconomics
- Solid and Hazardous Waste
- Public Safety and Nonradiological Health
- Radiological Effects of Normal Operations
- Nuclear Plant Safety and Security
- Decommissioning

Impact Analysis for Resources Evaluated in the SEIS

Resource Area	Phase	Impacts
Water Resources	Construction	Minor
	Operations	Minor
Floodplains & Flood Risk	Construction	Minor
	Operations	None
Wetlands	Construction	Minor
	Operations	None
Aquatic Ecology	Construction	Minor
	Operations	Minor
Terrestrial Ecology	Construction	Moderate
	Operations	Minor
Threatened & Endangered Species	Construction	Minor to Moderate
	Operations	Minor
Managed and Natural Areas	Construction	Minor
	Operations	Minor

Resource Area	Phase	Impacts
Recreation	Construction	Minor
	Operations	Minor
Transportation	Construction	Moderate to Large
	Operations	Minor
Visual Resources	Construction	Minor to Moderate
	Operations	Minor to Moderate
Archaeological Resources & Historic Structures	Construction	Minor
	Operations	Minor
Radiological Effects of Normal Operations	Construction	Minor
	Operations	Minor
Uranium Fuel Use Effects	Construction	Minor
	Operations	Minor

TVA CRN Site NEPA Reviews

Programmatic EIS (complete)	Supplemental EIS (in progress)	Future NEPA
Final PEIS published 8/2022 ROD signed 09/21/2022	**Draft issued January 2025** **Anticipated ROD Late Summer 2025**	TBD
TVA could proceed with: • Tree clearing in evaluated areas • Construction of osprey platforms/osprey nest relocation • Utility infrastructure installation along existing road rights-of-way • Improvements to existing roads • Construction of new onsite roads in evaluated areas within specific criteria • Grading & construction of berms in evaluated areas • Construction of facilities in evaluated areas that do not require permits or blasting, and are not in the protected area	After finalizing the SEIS TVA could proceed with: • Construction and operation of any safety-related nuclear power generation systems for CRN-1 • Excavation for the reactor building • Construction of intake and discharge facilities • Offsite 161-kV transmission improvements • Barge landing improvements • Import of borrow and/or development of onsite quarry • New site drainage, stormwater management, outfalls, and culverts; filling of landfills and existing ponds	Necessary for: • Significant changes in operations characteristics or impacts (if any) • Additional offsite transmission improvements (if any) • Preconstruction, construction, operation, and decommissioning of additional units (if any)

CRN Project Consultations & Permitting

Agency	Authority	Status
US Fish & Wildlife Service	Endangered Species Act Section 7 Consultation	In progress
Tennessee Historical Commission (State Historic Preservation Officer) & Federally Recognized Tribes	National Historic Preservation Act Section 106 Consultation	Complete
Watts Bar Interagency Working Group	Consultation regarding disturbance to sediments in the Reservoir	Complete
US Army Corps of Engineers	Clean Water Act Section 401 and 404 Permitting	In progress
US Army Corps of Engineers & US Coast Guard	Rivers and Harbors Act Section 10 Permitting	Future
TN Dept of Environment & Conservation	Aquatic Resource Alteration Permit	In progress

How to Provide Comments

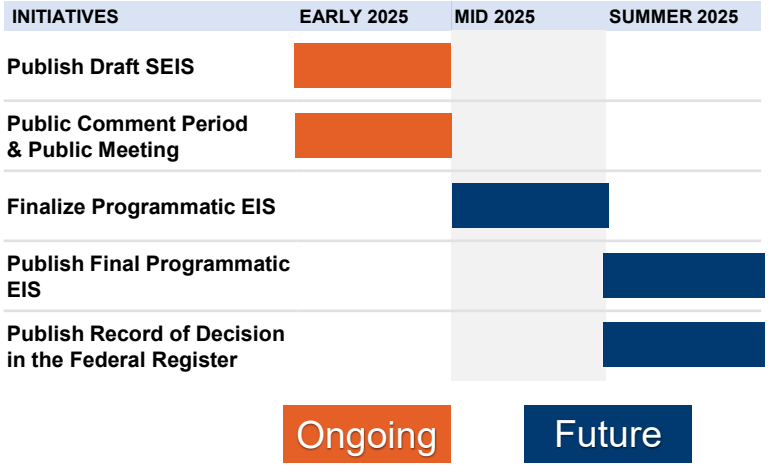
Comments can be provided by:

Email: nepa@tva.gov

Web: www.tva.com/nepa

Mail: Attn: Carol Butler Freeman
NEPA Compliance
400 West Summit Hill Drive, WT 11B
Knoxville, TN 37902

Projected CRN SEIS NEPA Schedule



Public comments are encouraged and must be submitted or postmarked by **March 18, 2025**.

Electronic comment submissions are preferred.

Please note that any comments received, including names and addresses, will become part of the project administrative record and will be publicly available.

TENNESSEE VALLEY AUTHORITY