

THE TENNESSEE VALLEY AUTHORITY



Clinch River Small Modular Reactor Site

Technical Report

Natural Areas

(Managed Areas & Sites)

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This study has been prepared as a supporting document for the Clinch River Small Modular Reactor Site (CR SMR) Early Site Permit Application Project and is being distributed for project use. The study provides a summary of documented wetland habitats present in CR SMR barge/traffic study area including the adjacent Clinch River, Roane County, TN.

1.0 Introduction

To support the evaluation of the suitability of the Small Modular Reactor (SMR) site, TVA staff conducted a site assessment to characterize in detail the natural areas within, adjacent to or within 3.0 miles of the proposed project site. Initial assessment of natural areas included a desk-top review of Natural Heritage database (Nature Conservancy, 2015) and an on-site assessments of Grassy Creek Habitat Protection Area (HPA). TVA identified 11 natural areas through review of the TVA Natural Heritage Project Database that were located within 3.0 miles of the previous geotechnical investigation for the SMR site. To further assess the proposed site for installation of the SMR, an on-site field survey was conducted in April 2011 for Grassy Creek HPA located within the initial project boundary footprint to identify listed and undocumented plant species. Subsequent project revisions excluded the Grassy Creek HPA from the project site boundaries.

1.2 Purpose and Scope

The objective of this task was for TVA to perform a complete assessment of natural areas that are within the project footprint, adjacent to or within 3.0 miles of the SMR site property and to provide a sufficient description of these areas for inclusion in the affected environment section of the EIS. Investigations included analyses of all natural areas and determination of potential impacts to natural areas in the vicinity.

1.3 Project Location

The Clinch River Breeder Reactor Site property is located in TN in Roane County along the Clinch River (Watts Bar Reservoir) approximately between Clinch River miles (CRM) 14 to CRM 19 and is adjacent south of the Oak Ridge Reservation (ORR). The TVA owned property consists of approximately 1255 acres and is located within the boundaries of the City of Oak Ridge, west of Oak Ridge National Laboratory (ORNL) and 10 miles southwest of the business district of Oak Ridge.

1.4 Site Characterization and Affected Environment

Natural areas include managed areas, ecologically significant sites, and Nationwide Rivers Inventory (NRI) streams. This section addresses natural areas that are on, immediately adjacent to, or within three miles of the SMR property. Managed areas include lands held in public ownership that are managed by an entity (e.g., TVA, U.S. Department of Energy (USDOE), State of Tennessee) to protect and maintain certain ecological and/or recreational features. Ecologically significant sites are either tracts of privately owned land that are recognized by resource biologists as having significant environmental resources or identified tracts on TVA lands that are ecologically significant but not specifically managed by TVA's Natural Areas program. NRI streams are free-flowing segments of rivers recognized by the National Park Service (NPS) as possessing remarkable natural or cultural values.

A review of the TVA Natural Heritage Database indicates five natural areas are located immediately adjacent to the SMR property: Grassy Creek HPA, Oak Ridge State Wildlife

Management Area (WMA), ORNL Research Park (and Biosphere Reserve), ORR and New Zion Unit Proposed State Natural Area (SNA).

The **Grassy Creek HPA**, located on Grassy Creek at CRM 14.5 on the right descending shoreline of Clinch River, abutting the proposed SMR project footprint. It is located on the northern end of the original Clinch River Breeder Site property, south of the Grassy Creek Embayment and out of the area designated for construction activities. In the TVA Watts Bar Reservoir Land Plan (Final Environmental Impact Statement) (February 2009), an additional 166 acres was added to this 99-acre tract for total of 265 acres to provide a buffer to sensitive habitat. Appalachian bugbane (*Cimicifuga rubifolia*), formerly listed as a state-listed species, has been reported on this site and was confirmed as occurring here during field surveys in 2011. If access is needed through this HPA, must contact TVA Natural Areas Biologist, Heather M. Hart (865-632-6362).

The **Oak Ridge State WMA**, adjacent to the proposed SMR site, is a 37,000-acre area managed by Tennessee Wildlife Resources Agency (TWRA) for small and large game hunting, and is located at CRM 18.8 to 14.5 on the right descending shoreline of Clinch River primarily on USDOE ORR. If access is needed through this WMA to access the SMR site, must contact TWRA manager James (Jim) Evans (865-574-8204 or 931-484-9571).

The **ORNL Research Park (and Biosphere Reserve)**, adjacent to the proposed site, contains approximately 20,000 acres and is within the boundaries of the ORR. The park is used as an outdoor laboratory for studying present and future environmental consequences from energy-related issues. It provides protected land for the use of education and research in environmental sciences. Managed by the ORNL for USDOE, it is located on the Clinch River at (CRMs 21.0 to 18.9) and on Melton Hill Reservoir at (CRMs 33.2 to 23.0) on the right-descending shoreline. If access is needed through the Research Park, must contact ORR natural resources manager Neil Giffen at 865-241-9421.

The **ORR**, adjacent to the proposed SMR site, is located on the Clinch River at CRMs 23.2 to 18.9. USDOE manages this 34,000-acre area, which is used variously for manufacture, laboratory research, managed forest, and ecosystem process research. As of 2009, a natural areas analysis was conducted by ORNL to document all the ecologically significant areas on ORR lands (Baranski, 2009). This study determined that there are 47 natural areas, eight aquatic natural areas, 17 reference areas, five aquatic reference areas, five conservation management areas, eight habitat areas, eight potential habitat areas, and eight special management zones within the ORR. If access is needed through the ORR to access the SMR site, contact Neil Giffen (865-241-9421).

Five proposed state natural areas (SNA) are within the boundaries of the ORR for future designation and protection under the Natural Areas Preservation Act. These five areas are considered ecological core areas and contain multiple smaller natural areas within their boundaries. One proposed SNA, New Zion, is adjacent to the SMR property. The other four proposed SNAs are within 3.0 miles of the SMR property.

The **New Zion Unit Proposed SNA** comprises 2,891 acres in the western portion of the ORR and is immediately adjacent to the east of the SMR property. It features portions of the Haw Ridge uplands, including rock outcrops, Raccoon Creek Barrens, Raccoon Creek Embayment as well as wetlands. Several rare and uncommon plant species occur here. This area has been nominated but not yet been designated as a SNA. Any access through this area would require notifying Brian Bowen, Program Administrator State Natural Areas Program, Tennessee Department of Conservation (TDEC), and Neil Giffen (865-241-9421).

The **Copper Ridge Unit Proposed SNA** comprises 3,908 acres located in the southern portion of the ORR, 2.3 miles southeast of the SMR property. Prominent features include Copper Ridge, extensive river bluffs on the perimeter of Melton Hill Lake, a variety of forest community types, several caves and sink holes, ravines, springs, seeps, and forested wetlands. This area has been nominated but not yet been designated as a SNA.

The **Black Oak Ridge Unit Proposed SNA** comprises 2,929 acres in the western part of the ORR (1.7 mile) north east of the SMR property. This natural area includes two sections: East Black Oak Ridge and West Black Oak Ridge separated by the Poplar Creek water gap and Blair Road. Prominent features are the East Fork Poplar Creek floodplain, Black Oak Ridge, McKinney Ridge hemlocks, Leatherwood bluff, mixed hardwood-native pine forest, and a large forested wetland. This area has been nominated but not yet been designated as a SNA.

The **Pine Ridge-Bear Creek Valley Unit Proposed SNA** comprises 4, 584 acres adjacent to the northern boundary of the DOE Reservation (2.5 mile) north east of the SMR property. Topographic features include Pine Ridge and the western portion of East Fork Ridge. There are extensive unfragmented forest and a variety of wetland habitat types, including headwater wetlands, seeps, marshes, and forested wetlands and sandstone outcrops. This area has been nominated but not yet been designated as a SNA.

The **Walker Branch-Three Bend Unit Proposed SNA** comprises 6,059 acres located (2.6 mile) east of the SMR property in the eastern corner of the ORR, including the entire Three Bend Scenic and Wildlife Area. The area includes one of the world's largest populations of the rare wildflower species, tall larkspur. This area has been nominated but not yet been designated as a SNA.

Additionally, two officially designated SNAs are within a three-mile radius of the proposed SMR property located outside the ORR. These are:

The **Campbell Bend Barrens Designated SNA** is approximately (1.7 miles) northwest of and across the Clinch River from the proposed site. This 35-acre area, managed TDEC, consists of small barrens that are a rare community type in a region where much of the land base has been developed or converted to agriculture. Eastern red cedar, white pine, post oak, dwarf chinquapin oak, and other hardwoods are scattered throughout the open grassland community. The dominant grasses include little and big bluestem and side-oats gramma. The barrens community within the nature area is approximately four to six acres.

The **Crowder Cemetery Cedar Barrens Designated SNA** is approximately (1.8 miles) west of and across the Clinch River from the proposed site. This 15-acre area, managed by TDEC, has grasslands in a matrix of mixed oak-pine with eastern red cedar and other hardwoods that are scattered throughout the barrens. Grasses include little bluestem and side-oats gramma and rare plants include slender blazing star and prairie dock. The dwarf chinquapin oak that is uncommon in Tennessee also is found here.

Literature Cited

Baranski, Michael J. 2009. Natural Areas Analysis and Evaluation Oak Ridge Reservation. Oak Ridge National Laboratory. http://www.esd.ornl.gov/facilities/nerp/NA_ORR_TM-2009_201.pdf

Nature Conservancy. 2015. TVA Regional Natural Heritage Database supported by NatureServe [online] available at <http://www.nature.org/>