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## 2.5.5 Stability of Slopes

The information presented in this subsection is based on the results of the site-specific subsurface investigation performed at the Clinch River Nuclear Site, which is described in [Subsection 2.5.4](#). Note that the detailed data collected from this site-specific subsurface investigation are contained in [Reference 2.5.5-1](#).

The Clinch River Nuclear Site is located along the Clinch River arm of the Watts Bar Reservoir within the City of Oak Ridge, Tennessee. The topography in this area consists of a series of northeast to southwest trending alternating ridges and valleys. During previous site grading at the Clinch River Property, as described in [Subsection 2.5.4.1](#), portions of the ridges were excavated and some of the valleys were filled resulting in a gently sloping topography within the power block area. Immediately west of the power block area, an excavation approximately 35 ft deep remains from the previous site grading. Several ridges are located immediately east of the power block area.

As described in [Subsection 2.5.4.1](#), the existing ground surface at and around the power block area at the time of the subsurface investigation is generally gently sloping downward from northwest to southeast, ranging from approximately Elevation 855 to 780 ft North American Vertical Datum of 1988 (NAVD88) ([Reference 2.5.5-1](#)). Note that all references to elevations given in this subsection are to NAVD88. The power block finish grade elevation is at 821 ft.

Details of the proposed site grading are currently not developed. However, given the existing topography, the natural topography, and the planned finished grade elevation of 821 ft, a flat table-top site with no safety-related slopes is anticipated. The site grading plan and the stability of any safety-related slopes, including dams and dikes, are evaluated in the combined license application (COLA).

### 2.5.5.1 Slope Characteristics

While the planned finished grade elevation of the power block area is set at 821 ft, the power block configuration and site grading have not been established. Therefore, the configuration and characteristics of any permanent slopes have not been determined. The configurations and characteristics of any permanent slopes are established and evaluated in the COLA.

During construction, a temporary excavation cut slope will be made in the power block area to construct foundations. This excavation will be made in soil, weathered rock, and hard rock. The excavation will include vertical faces as well as a sloped ramp for construction access. The excavation will be backfilled and no slopes will remain after construction in the power block area.

Groundwater conditions in the power block area, including seepage and high and low groundwater levels, are discussed in [Subsection 2.4.12](#).

### 2.5.5.2 Design Criteria and Analyses

Since site grading has not been established, the presence of permanent safety-related slopes cannot be determined. This determination will be made during the combined operating license stage. If permanent safety-related slopes are identified, these slopes will be analyzed to ensure adequate margin against the potential failure of these slopes impacting safety-related structures.

Construction excavation cut slopes will be required in the power block area for construction of the foundations. Soil and rock will be removed and replaced with compacted granular backfill and lean concrete, respectively. The conceptual design of the excavation, including excavation support and slope stabilization details, is developed in the COLA. The construction excavation

cut slopes will be temporary since they are for the construction period only. The excavation will be backfilled and none of these slopes will remain after construction in the power block area.

### **2.5.5.3 Results of the Investigation**

As described in **Subsection 2.5.4**, a detailed subsurface investigation encompassing the power block area was conducted and included material characterization, foundation analysis, and rock mass characterization. These data will be used for conceptual design of the foundation excavation cut slopes and the design of any permanent safety-related slopes.

### **2.5.5.4 Properties of Borrow Material**

Information related to backfill and borrow material for safety-related backfill is provided in **Subsection 2.5.4.5**. If safety-related permanent slopes are identified once site grading has been established, the properties of any borrow material for construction of these slopes will be determined.

### **2.5.5.5 References**

- 2.5.5-1. AMEC (AMEC Environmental and Infrastructure, Inc.), *Geotechnical Exploration and Testing, Clinch River SMR Project, Oak Ridge, Tennessee*, Data Report, Rev. 4, October 2014.