



## Raccoon Mountain Pumped Storage Plant Tennessee Valley Authority (TVA)

**Location:** Chattanooga, Tennessee

**Date:** 2010 – 2011

**Structure:** Underground Pump Storage

**Length:** Four Raise Bore Shafts: diameter underground openings: approx. 20 ft., height up to 1,100 ft.;  
IPB Chamber: length 297 ft., height 30 ft.;  
New Access Tunnels: diameter approx. 20 ft., length up to 1,500 ft.;  
IPB Bus Run: up to 2,000 ft.;  
IPB Tunnel: up to 1,500 ft.

**Geology:** Dark gray, fine to medium grained sandstone, alternating sandstone and shale, light to dark gray shale, and thin coal seams. Majority of scheme to be located in Bangor Limestone Formation

**Client:** Tennessee Valley Authority

**Owner:** Tennessee Valley Authority



**Figure 1.** Raccoon Mountain PSP upper reservoir intake structure (Courtesy of TVA).

### Independent Expert Review Services:

The Raccoon Mountain Pumped Storage Plant (PSP) has four main unit transformers that were located inside the underground powerhouse. TVA planned to move these transformers outside of the mountain. Three new sites had been chosen as possible options: Option 1) Middle of the mountain, Option 2) Bottom of the mountain, and Option 3) Top of the Mountain. The objective was to analyze all three and determine which location best suits the transformers based on feasibility, safety costs, and schedule. The proposed transformer relocation required the development of new isolated phase bus (IPB) chambers, stub tunnels, and shafts.

Gall Zeidler Consultants (GZ) was part of the Independent Review Board and helped to evaluate existing conditions, determine impacts, and provide construction recommendations for the underground work. Sequential excavation methods (SEM) were used with short excavation rounds followed by installation of initial support consisting of rock reinforcement and shotcrete. Raise bore technology as well as drill and blast methods were implemented. Waterproofing and control measures were assessed to decrease the impact of localized groundwater inflows.



**Figure 2.** Raccoon Mountain PSP power plant chamber (Courtesy of TVA).