Introduction

The U.S. Air Force Research Laboratory (AFRL) recruits about 500 civilian personnel (100 in FY 2010, 150 in FY 2011, 200 in FY 2012) to provide research on topics that support the development of future aircraft. This recruitment effort is accomplished by means of a strategic marketing campaign that focuses on attracting young professionals to the region's defense sector. These professionals are expected to work in a high-paced environment, often working long hours and weekends. In addition to the high demands on their time, AFRL provides opportunities for continued education and growth.

Hydrogeologic Setting

The Manchester aquifer is located in the center of the Highland Rim physiographic province (Tennessee, Kentucky, Ohio, Indiana, Illinois, and Missouri). The Highland Rim physiographic province is a large, flat-topped, upland region that is characterized by a lack of relief and a uniform surface slope. The Highland Rim is composed of two major regional features: the Highland Rim Escarpment and the Highland Rim Trough. The Highland Rim Escarpment is a steep, rugged, escarpment that marks the boundary between the Highland Rim Trough and the Highland Rim Plateau. The Highland Rim Trough is a broad, flat-topped region that is characterized by a lack of relief and a uniform surface slope.

Stratigraphy

The Cretaceous, Tertiary, and Quaternary sediments that make up the Manchester aquifer are composed of a variety of rock types, including sandstone, siltstone, shale, and limestone. The Cretaceous sediments are the oldest and are composed of sandstone and siltstone. The Tertiary sediments are composed of sandstone, siltstone, and shale, and the Quaternary sediments are composed of sandstone, siltstone, and gravel.

Sedimentology

The Manchester aquifer is composed of a variety of sediments, including sandstone, siltstone, and shale. The sandstone is composed of quartz, feldspar, and mica, and the siltstone is composed of silt-sized clay particles. The shale is composed of clay-sized particles. The sandstone is typically well sorted, and the siltstone and shale are typically poorly sorted.

Exploration of Potentiometric Surface Maps

The exploration of potentiometric surface maps is an important aspect of hydrogeologic studies. These maps are used to identify areas with high water levels, which are typically associated with areas of groundwater recharge. The maps are also used to identify areas with low water levels, which are typically associated with areas of groundwater discharge.


Figure 1. Map showing the potentiometric surface of the Manchester aquifer in the Arnold Air Force Base area, Tennessee, May 2005.