

3.9 Geology Affected Environment

This section presents the existing geologic and seismic conditions of the Winchester to Temecula (WT) Corridor. The study area for this geologic review of the proposed WT Corridor includes the 150 to 300 m (500 to 1,000 foot) bandwidth, the adjacent surrounding areas, and in part, the Southern California region. The WT Corridor project area lies in the plains of western Riverside County, which include the Murrieta and Temecula valleys. Since all seven corridor alternatives (1, 3, 5a, 5b, 7a, 7b, and Hybrid [H]) are regionally close to each other, the general discussion of the geology, liquefaction, seismology, along the WT Corridor is applicable to all seven alternatives.

The sources of information for the geology setting include the Riverside County Integrated Plan (RCIP) Existing Setting Report (LSA, 1999), the CETAP technical reports, and field reconnaissances of the site and surrounding area.

3.9.1 Regional Geology

California is made up of eleven geomorphic provinces as defined by the California Department of Mining, two of which, the Transverse Ranges Province and the Peninsular Ranges Province, comprise western Riverside County. The WT Corridor is located within the Peninsular Ranges Province and south of the Transverse Ranges Province. The Peninsular Ranges Province terminates at the Transverse Ranges Province to the north, forms the long peninsula known as Baja California, and trends to the tip of Baja California, Mexico, to the south. The northeast reaches of the Peninsular Ranges are the San Jacinto Mountains, which include Mount San Jacinto and the town of Idyllwild. These areas are located outside the study area approximately 32 km (20 mi) east of the proposed northernmost alternatives, 7a and 7b. Figure 3.9.1, Geomorphic Provinces and Regional Faults, illustrates these provinces as related to the WT Corridor study area.

The northern movement of the Pacific plate against the San Andreas Fault has formed the east-west axis of the Transverse Ranges Province from west of Santa Barbara to east of San Bernardino. The Transverse Ranges Province consists of the following primary mountain ranges: the Santa Ynes Mountains, the San Gabriel Mountains, and the San Bernardino Mountains. The San Bernardino National Forest has the tallest peak in Southern California, Mt. San Gorgonio [3506 m (11,502 ft)], which is located approximately 50 km (31 mi) north of Alternatives 7a and 7b of the WT Corridor.

The study area is within the eastern Los Angeles Basin, a term that specifically refers to an alluvial outwash that includes most of Los Angeles and Orange Counties, as well as western San Bernardino and Riverside Counties (Schoenherr, 1992). The geological makeup of the southeast Los Angeles Basin (western Riverside County) consist primarily of alluvium, Pleistocene nonmarine, and Upper Jurassic Marine, which are all sedimentary rock, and Mesozoic granite, Jura-Trias metavolcanic, and Pre-Cenozoic granitic and metamorphic, which are igneous and meta-igneous rocks. (Santa Ana Sheet, 1976). The sedimentary rocks are deposited on Upper Jurassic to Lower Cretaceous metasedimentary and metavolcanic roof pendants of the Southern California batholith (granite). The uppermost surficial sediments consist of gravely, sandy to clayey alluvium, fluvial floodplain deposits, and/or older alluvium and marine terrace deposits (Greenwood, et. al, Centerline reference). Geological profiles for each alternative are provided below.

Figure 3.9.1 - Geomorphic Provinces and Regional Faults