Selected Critical Facilities and Geologic Hazards, Utah County, Utah

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Liquefaction Hazard

Liquefaction may occur when water-saturated sandy soils are subjected to earthquake ground shaking. When soil liquefies, it loses strength and behaves as a viscous liquid rather than a solid. This can cause buildings to sink into the ground or tilt, empty buried tanks to rise to the ground surface, slope failures, lateral spreading, surface subsidence, ground cracking, and sand blows.

Two conditions must exist for liquefaction to occur: (1) the soil must be susceptible to liquefaction (loose, water-saturated, sandy soil, typically between 0 and 30 feet below the ground surface) and (2) ground shaking must be strong enough to cause susceptible soils to liquefy. The most susceptible soils are generally along rivers, streams, and lake shorelines, as well as in some ancient river and lake deposits.

The liquefaction potential categories shown on this map depend on the probability of having an earthquake within a 100-year period that will be strong enough to cause liquefaction in those zones. High liquefaction potential means that there is a greater than 50 % probability of having an earthquake within a 100-year period that will be strong enough to cause liquefaction. Moderate means that the probability is between 10% and 50%, low is between 5% and 10%, and very low is less than 5%.

Surface Fault Rupture Hazard

Holocene faults have ruptured the surface in the last 10,000 years. The average time between ruptures is from one to two thousand to more than ten thousand years. These faults have a relatively higher likelihood of surface faulting in the future.

Quaternary faults have not ruptured the surface in the last 10,000 years. The average time between ruptures is from several tens to hundreds of thousands of years. These faults have a relatively lower likelihood of surface faulting in the future.

This map is for general reference only. Liquefaction information was modified from work done by L.R. Anderson, J.R. Keaton, and J.E. Bischoff in 1986 under U.S. Geological Survey Contract 14-08-0001-21359, and recently published as: Anderson, L.R., Keaton, J.R., and Bischoff, J.E., 1994, Liquefaction potential map for Utah County, Utah: Utah Geological Survey Contract Report 94-3, scale 1:48,000.

Digital Data was provided by the State Geographic Information Database (SGID) and the Utah Automated Geographic Reference Center.

Landslide information was modified from compilations done by K.M. Harty and published as: Harty, K.M., 1992, Landslide map of the Lynndyl 30' x 60' quadrangle, Utah: Utah Geological Survey Open-File Report 261, scale 1:100,000, Harty, K.M., 1992, Landslide map of the Nephi 30' x 60' quadrangle, Utah: Utah Geological Survey Open-File Report 263, scale 1:100,000, Harty, K.M., 1992, Landslide map of the Price 30' x 60' quadrangle, Utah: Utah Geological Survey Open-File Report 265, scale 1:100,000, Harty, K.M., 1992, Landslide map of the Provo 30' x 60' quadrangle, Utah: Utah Geological Survey Open-File Report 256, scale 1:100,000, Harty, K.M., 1992, Landslide map of the Rush Valley 30' x 60' quadrangle, Utah: Utah Geological Survey Open-File Report 254, scale 1:100,000, Harty, K.M., 1992, Landslide map of the Salt Lake City 30' x 60' quadrangle, Utah: Utah Geological Survey Open-File Report 236, scale 1:100,000.

Fault information was modified from: Brimhall, W.H., and Merritt, L.B., 1981, The geology of Utah Lake--implications for resource management: Great Basin Naturalist Memoirs Number 5, p.24-42, scale 1:250,000, Davis, F.D., compiler, 1983, Geologic map of the southern Wasatch Front, Utah: Utah Geological and Mineral Survey Map 55-A, scale 1:100,000, Hecker, Suzanne, 1989, Unpublished mapping, scales 1:24,000, 1:62,500, and 1:100,000, Jensen, M.E., 1984, Geologic map and section of the Slate Jack Canyon quadrangle, Juab and Utah Counties, Utah: Brigham Young University Geology Studies, v. 33, pt. 1, p. 1-19, scale 1:24,000, Machette, M.N., 1992 Surficial geologic map of the Wasatch fault zone, eastern part of Utah Valley, Utah County and parts of Salt Lake and Juab Counties, Utah: U.S. Geological Survey Miscellaneous Investigations Series Map I-2095, scale 1:50,000, Machette, M.N., Personius, S.F., and Nelson, A.R., 1992, Paleoseismology of the Wasatch fault zone--a summary of recent investigations, interpretations, and conclusions, in Gori, P.L., and Hays, W.W., editors., Assessment of regional earthquake hazards and risk along the Wasatch Front, Utah: U.S. Geological Survey Professional Paper 1500-A, 71 p., figure 18, scale 1:264,000, Sullivan, J.T., Nelson, A.R., LaForge, R.C., Wood, C.K., and Hansen, R.A., 1988, Central Utah regional seismotectonic study for USBR dams in the Wasatch Mountains: Denver, U.S. Bureau of Reclamation Seismotectonic Report 88-5, 269 p., scale 1:250,000.