WHAT IS LIQUEFACTION?
Liquefaction is a phenomenon in which strong earthquake shaking causes a soil to rapidly lose its strength and behave like quicksand. Liquefaction typically occurs in artificial fills and in areas of loose sandy soils that are saturated with water, such as low-lying coastal areas, lakebeds, and river valleys. When soil strength is lost during liquefaction, the consequences can be catastrophic. Movement of liquefied soils can rupture pipelines, move bridge abutments and road and rail line alignments, and pull apart the foundations and walls of buildings. Ground movement resulting from liquefaction caused massive damage to highways and railways throughout southern Alaska during the 1964 Good Friday earthquake. During the 1995 Los Angeles earthquake, liquefaction was a contributing factor to severe building damage in the Marina District of San Francisco. Liquefaction-induced ground movement also broke water lines, severely hampering control of the ensuing fires in the Marina District. Damage caused by liquefaction to the port area of Kobe, Japan during the 1995 earthquake resulted in billions of dollars in reconstruction costs and lost business.

WHAT IS A LIQUEFACTION SUSCEPTIBILITY MAP?
A liquefaction susceptibility map provides an estimate of the likelihood that soil will liquefy as a result of earthquake shaking. This type of map depicts the relative susceptibility to liquefaction that varies from very low to high. Areas underlain by bedrock or wet are mapped separately as these soils do not liquefy, although they may be subject to permanent ground deformation caused by earthquake shaking.

HOW CAN THIS MAP BE USED?
Liquefaction susceptibility maps can be used in many different purposes by a variety of users. For example:
- Emergency managers can determine which critical facilities and lifelines are located in hazardous areas.
- Building officials and engineers can select areas where detailed geotechnical studies should be performed before new construction occurs.
- Facility managers can assess the vulnerability of campuses and public facilities, including schools, and recommend actions required to minimize public safety and minimize earthquake damage and loss.
- Insurance providers can determine relative seismic risk in the calculation of insurance ratings and premiums.
- Land planners can reduce vulnerability by recommending appropriate zoning and land use in high hazard areas to promote long-term mitigation of earthquake hazards.
- Private property owners can guide their decisions on purchasing, rezoning, and upgrading their properties.

This map is intended only as a general guide to delineate areas prone to liquefaction. It is not a substitute for site-specific investigation to assure the potential for liquefaction for any development project. Because the data used in the liquefaction susceptibility assessment have been subdivided on the basis of regional geologic mapping, this map cannot be used to determine the presence or absence of liquefiable soils beneath any specific location. This determination requires a site-specific geotechnical investigation performed by a qualified practitioner.

This map is intended to be printed as a scale of 1:100,000 and was generated using 1:100,000-scale digital coverages of the geologic mapping; therefore, the digital data reflect the original 1:100,000-scale of the mapped area. As with all maps, it is recommended that the user not simply apply, either digitally or on paper, a scale greater than the source data.

REFERENCES CITED
Palmer, S. P., 1995, Liquefaction analysis of soil deposits found in the Sumner quadrangle, in Dragovich, J. D.; Pringle, P. T., Liquefaction susceptibility for the Sumner 7.5-minute quadrangle, Washington Division of Geology and Earth Resources, Map GM-44, 1 sheet, scale 1:36,000, with 1 p. text.
Washington Division of Geology and Earth Resources, 2001, Digital geologic maps of the State of Washington (Washington Division of Geology and Earth Resources Geologic Map GM-103), 4 sheets, scale 1:100,000, with 14 p. text.