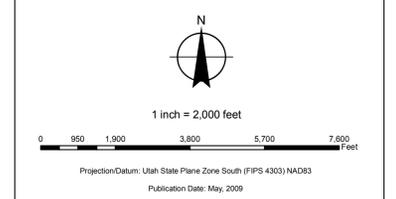


Adverse Construction Condition Shallow Ground Water

Utah Geological Survey Special Study 127
Geologic Hazards and
Adverse Construction Conditions
St. George-Hurricane Metropolitan Area
Washington County, Utah, 2008

City of Hurricane
147 N 870 W
Hurricane, UT 84737
GIS



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Description
Ground water can be one of the most costly factors in construction and land development if it is not recognized and taken into consideration in the planning process (Shelton and Proby, 1979). However, shallow ground water rarely if ever causes rapid, catastrophic property damage or is a threat to life safety, therefore, for purposes of this study, shallow ground water is considered an adverse construction condition and not a geologic hazard. Most construction-related ground-water problems occur when ground water is within 10 feet of the ground surface. Shallow ground water (10 feet figure) can flood basements and other underground facilities, damage buried utility lines, and destabilize excavations (Black and others, 1999). Inundation of landfills, waste dumps, and septic-tank systems can impair the performance of those facilities and lead to ground-water contamination. Because of its ability to change the physical and chemical nature of rocks and soil, ground water can also induce volumetric change in expansive and collapsible soils, and is a major factor in slope instability (Ashraf and others, 2005, 2006). During earthquakes, ground water within 50 feet of the ground surface may cause some soils to liquefy.

Using This Map
The Shallow-Ground-Water-Susceptibility Map (plate 14) shows the location of known and possible areas of shallow ground water in the St. George-Hurricane metropolitan area. The map is intended for general planning purposes to indicate where shallow ground water may be present and where special studies may be required. The UGS recommends a site-specific geotechnical foundation/geologic-hazards study for all development at all locations in the St. George-Hurricane metropolitan area. Site-specific studies can resolve uncertainties inherent in generalized hazard mapping and help ensure safety by identifying the need for special foundation designs or mitigation techniques. This is particularly true in the case of shallow ground water because our geotechnical database indicates that localized areas of shallow, perched ground water too small to show on the Shallow-Ground-Water-Susceptibility Map may be present anywhere within the study area. A site-specific investigation can establish the presence or absence of shallow ground water at a site, and if shallow ground water is present or is expected to be seasonally present, estimate the shallowest ground-water level expected. Doing so may require monitoring observation wells through more than one season and/or examining sediments exposed in test pits for evidence of seasonal ground-water fluctuations. If shallow ground water is present, or if the potential for seasonal shallow ground water exists, the consultant should provide appropriate design recommendations.

See section 8, "Shallow Ground Water", in the full report for more detailed information.

Classification:
For a detailed explanation of the contents of this map, contact the Hurricane Planning Department for a copy of Special Study 127

Shallow Ground Water

- SGW1-Naturally wet soils or areas of permanent shallow ground water
- SGW2-Poorly drained or slow draining generally fine-grained soils
- SGW3-Moderately to freely draining soils with seasonal or transient shallow ground water

- Legend**
- Hurricane City Limits
 - Creek
 - Canal
 - Major Streets
 - Dirt St.
 - State Highway
 - I-15
 - Ramp
 - RCDR Babylon Section
 - Parcels
 - Virgin River

Map Sources:
Parcels, Hurricane GIS Dept. Modified from Washington County GIS data downloaded Feb., 2009.
Streets, Hurricane City GIS Dept. Modified from Washington County GIS data downloaded Feb., 2009.
Aerial, USDA, National Agriculture Imagery Program (NAIP) 2006. Distributed by the Utah AGRC and reprojected to Utah State Plane, South (FIPS 4303), NAD 83 (CONUS), Survey Feet from the original. SID source file.