

**Geological Constraints**

A geological constraint is a geological process or situation affecting certain locations to such an extent that traditional human development of the affected land area is difficult, costly, or limited. In some cases the constraint may be so severe as to be a potential hazard to lives and property. In other cases the constraint may be overcome by advanced engineering technology and its resultant costs. The little or no quantified geologic data exists for the assignment of relative ratings (such as low, moderate, and high) to the geological constraints. Therefore, the approach has been to delineate areas where the identified constraint is likely to be a significant concern.

**FLOODING AND LIQUEFACTION CONSTRAINT**

Areas shown include floodplains which will be affected during seasonal flooding events as well as those areas which may be affected by catastrophic flooding caused by the rapid drainage of glacially-dammed lakes. These areas during earthquakes may be subject to liquefaction with resultant settlement, severe loss of bearing strength, sand fissuring, and ground cracking.

**SLOPE INSTABILITY AND EROSION CONSTRAINT**

Areas shown include slopes which have failed or may fail by landsliding as well as those areas affected by high rates of stream erosion.

**VOLCANIC CONSTRAINT**

Areas shown include the active and dormant volcanoes of the Wrangell and St. Elias Mountains and also includes the areas covered by known debris avalanches, mudflows, and lava flows.

**TSUNAMI (SEISMIC SEA WAVES) CONSTRAINT**

Areas shown are those which were affected by tsunami waves during the Great Alaskan Earthquake of 1964. Area affected includes the entire shoreline around Fort Valdez. Circled numbers note at their locations the elevations of maximum wave height.

**DOCUMENTED ICING CONSTRAINT**

Areas shown are those documented in published sources where extensive areas of ice are formed by channel freezing, ice-damming and extensive overflowing. Linear (narrow) icings are indicated as a line with symbol "CI" - Channel icings; while large areas are indicated as a polygon with symbol "I" - icing. Channel icings shown as line segments do cross polygon boundaries. Note that other undocumented icings undoubtedly occur within other areas of the quadrangle.

**MUD VOLCANO CONSTRAINT**

Point shows location of mud volcano.

**POTABLE WATER CONSTRAINT**

Some water wells in the area including Glennallen, Gakona, and Gulkana yield low quality, saline water. Area of this constraint is not definable by limited available data.

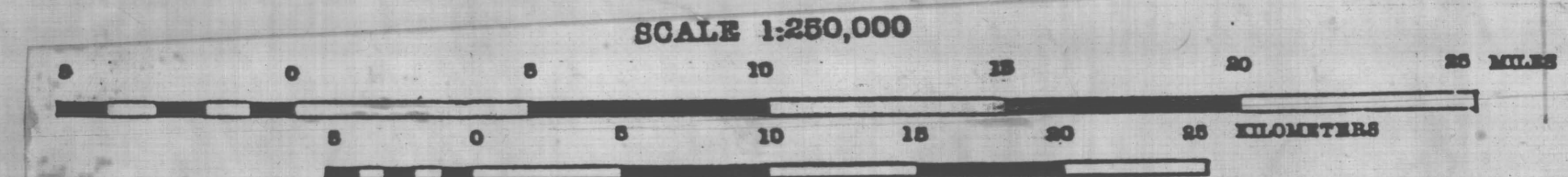
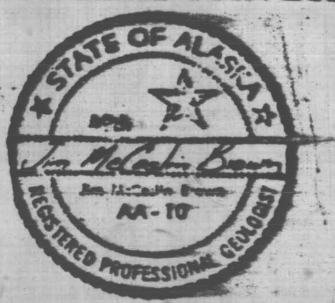
**NO APPARENT CONSTRAINT**

Areas shown are those where no identified geological constraint has been identified.

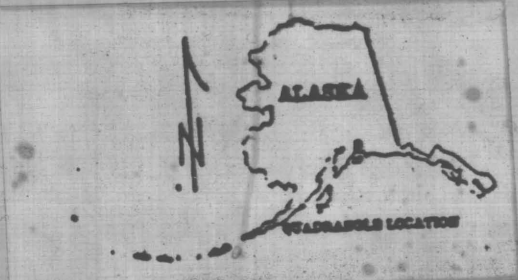
Some polygons shown are affected by two constraints, for example SE + VC (Slope instability and Erosion Constraint plus Volcanic Constraint). A few polygons are affected by three constraints, for example I + FL + VC (Icing Constraint plus Flooding and Liquefaction Constraint plus Volcanic Constraint).

This document is intended only for general land management and planning purposes. There has been no field verification of the interpretations displayed on this map. Projects that require site-specific data will require on-site investigation.

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McCarthy Quadrangle  
Geological Constraints



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