

Land-Surface Subsidence

Ratzlaff (1982) stated that the major cause of land-surface subsidence in the Gulf Coast aquifer was the withdrawal of ground water, oil, and gas. Locally, subsidence may also result from sulfur mining. If and when in-situ burning of lignite occurs in other geological units, there may also be accompanying land-surface subsidence.

In 1942, Meinzer and Wenzel postulated that the water pressure in an artesian aquifer provides a buoyant effect which helps support the aquifer. When

water pressure is reduced, the buoyant effect is reduced and an additional load is transferred to the skeleton of the aquifer. A pressure difference between sands and clays then causes water to move from the clays to the sands. This, in turn, causes compaction of the clays which results in irreversible subsidence of the land surface (Loskot and others, 1982).

The same principles involved in the withdrawal of ground water also apply to the withdrawal of fluids related to oil and gas production. However, there are differences in reservoir properties and in the magni-

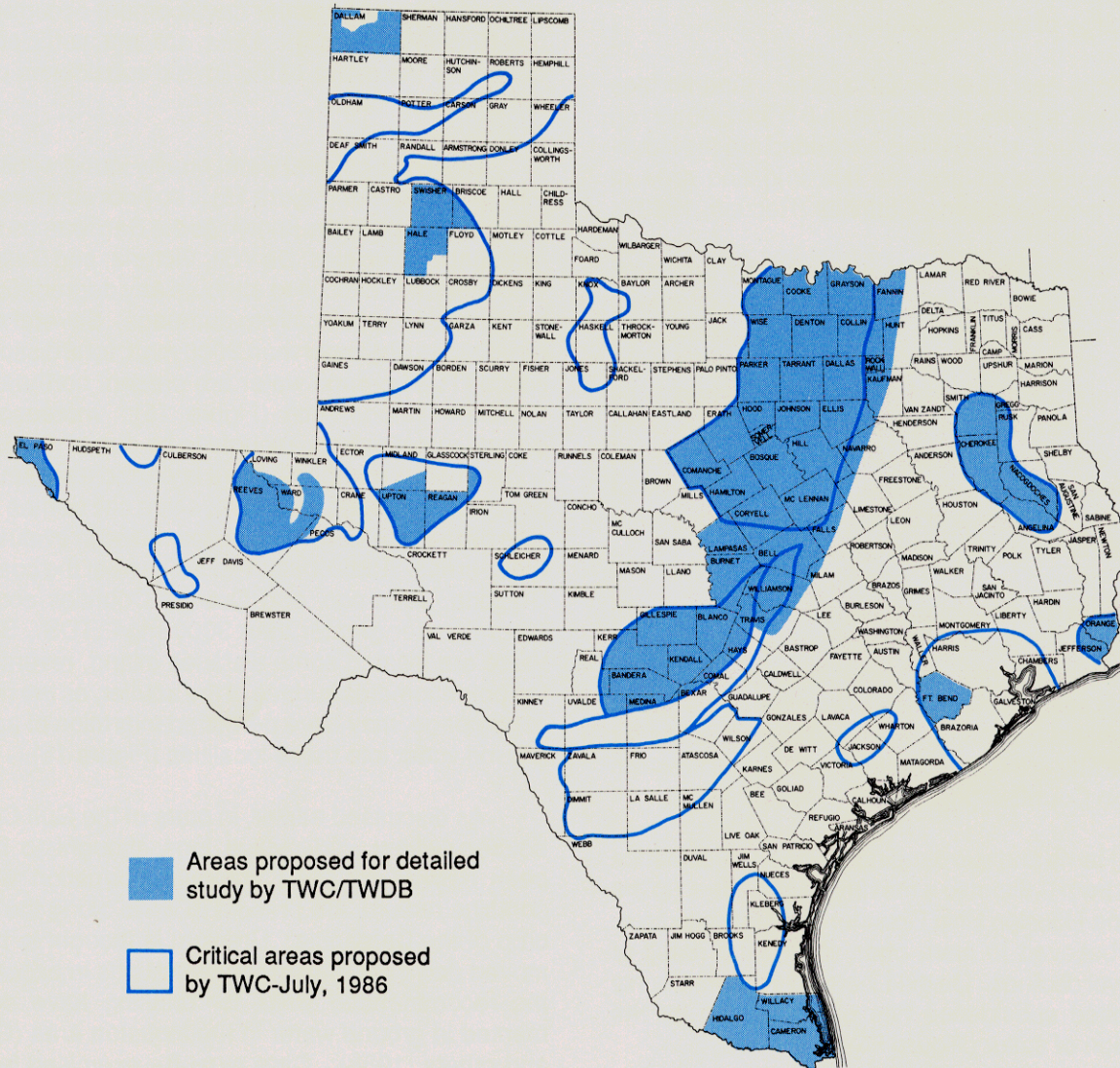


Figure 54.—Areas in Texas With Existing or Potential Underground Water Problems