

3.2.13 Hickory

The Hickory aquifer occurs in 19 counties in the Llano Uplift region of Central Texas, as shown in Figure 51. Most of the water currently pumped from the Hickory is used for irrigation and livestock purposes, with a smaller amount used for municipal supply purposes. Most of the pumpage from the Hickory occurs in Mason County, where almost all is used for irrigation.

A schematic cross section of the Hickory is shown in Figure 52. The Cambrian age Hickory Sandstone is located around the exposed Precambrian rocks that form the Llano Uplift. Outcrops of the Hickory are discontinuous, and block faulting has compartmentalized much of the aquifer, restricting groundwater flow in some areas. The down-dip, confined portion of the aquifer encircles the uplift and extends to depths greater than 4,500 feet.

Hickory groundwater is generally found under water-table conditions in the outcrop area and under artesian conditions down-dip. A majority of the groundwater production occurs in the outcrop area. Transmissivity estimates range from 5,000 to over 40,000 gpd/ft and confined storage coefficients range from 1×10^{-1} to 1×10^{-4} , and specific yields near the outcrop are estimated to be 0.10 to 0.15. Yields of large-capacity wells usually range between 200 and 500 gpm, although some wells have yields in excess of 1,000 gpm. The highest well yields are typically found northwest of the Llano Uplift, where the aquifer has the greatest saturated thickness. Typical well depths near the outcrop range from 50 to 200 feet, and can be as deep as 2,000 to 5,000 feet deep at the outer down-dip extents of the aquifer.

Recharge to the Hickory aquifer is from the infiltration of precipitation on the outcrop and from the downward leakage from the overlying Trinity aquifer. The amount of recharge from precipitation is limited due to the discontinuous and limited extent of the outcrop of the Hickory in the area. The amount of recharge from the Trinity is unknown. Groundwater flow is from the recharge areas to down-dip areas. Generally, groundwater flows radially down-dip away from the central part of the Llano Uplift. Discharge from the Hickory is to wells and through cross-formational leakage to overlying units.

Figure 51 shows the groundwater quality in the Hickory aquifer. Groundwater from the aquifer is generally fresh near the outcrop of the aquifer and up to 30 miles down-dip. However, the aquifer also contains sporadic occurrences of water with 1,000 to 3,000 mg/L TDS throughout the entire extent of the aquifer as well as in the down-dip portions of the aquifer. There are very few wells with water-quality data or geophysical logs that exist in areas of the Hickory containing moderately-saline groundwater, and therefore the estimate of the 10,000 mg/L TDS line is largely speculative. The down-dip extent of water containing greater than 3,000 mg/L TDS is limited on the south, east, and southeastern side of the uplift due to structural controls that limit the extent of the aquifer in those areas. On the northwest extent of the aquifer, the water quality degrades quickly from 1,000 mg/L TDS to greater than 10,000 mg/L TDS in the down-dip portions of the aquifer.

Summary

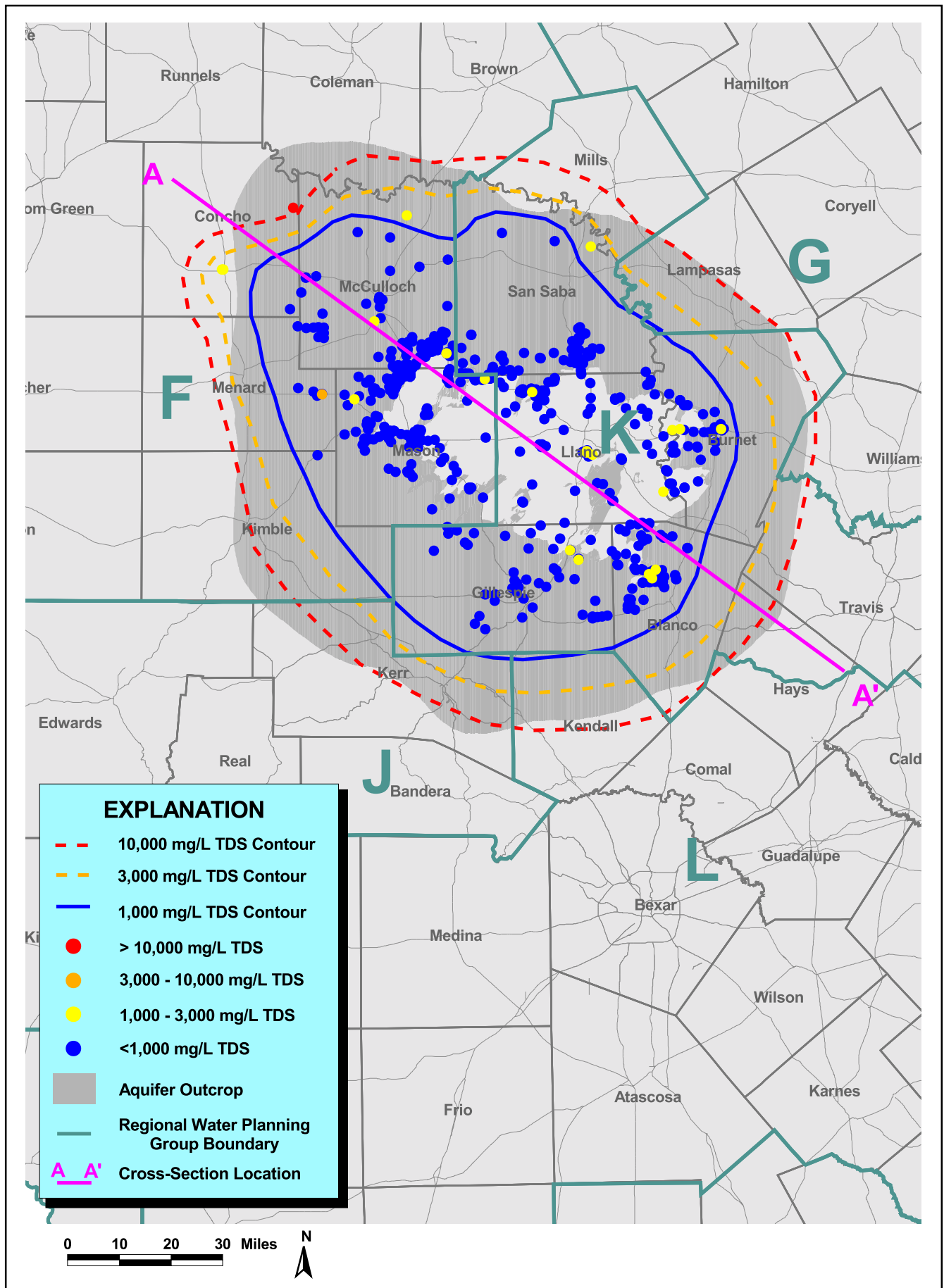
In general, little is known about the Hickory aquifer, especially about the down-dip sections of the aquifer where the brackish water resources are located. Based on available data, the Hickory is considered to have average potential as a brackish groundwater supply in down-dip areas. However, due to higher levels of radium found in some areas of the aquifer, it would be optimal to locate areas in the aquifer that have lower radium concentrations or to develop treatment and waste disposal alternatives that effectively deal with the radium issue.

Availability- LOW to MODERATE- In much of the aquifer's extent, so little is known about the Hickory that estimates of availability are speculative. In regions with relatively large portions of the Hickory, the availability of brackish groundwater is expected to be low to moderate.

Productivity- MODERATE- The lower transmissivity in the down-dip portions of the Hickory make the productivity of using this aquifer as a brackish resource only moderate.

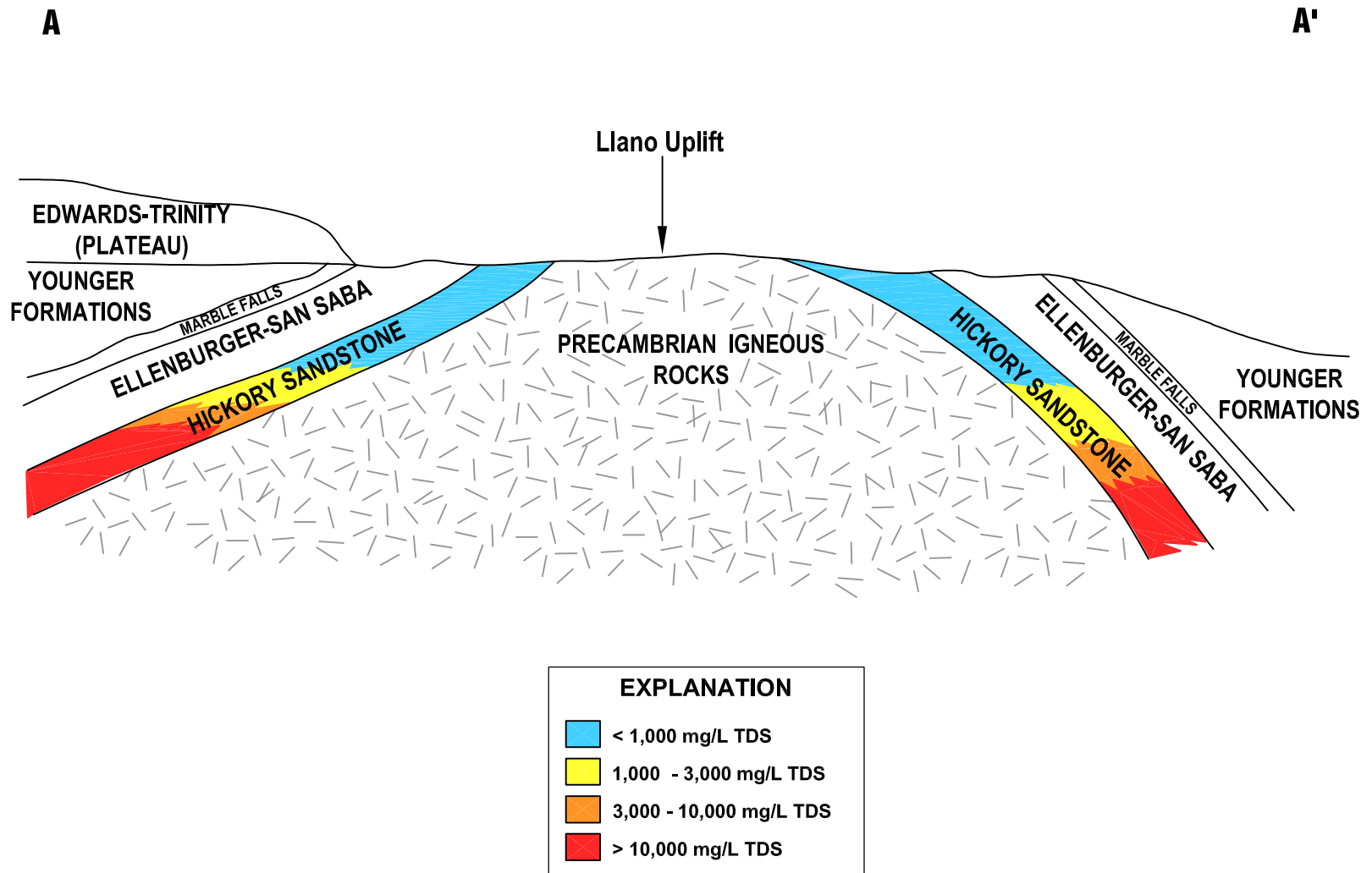
Source Water Production Cost- MODERATE to HIGH- Due to the deeper nature and lower productivity of the brackish portion of the aquifer, the relative production costs are expected to be moderate to high.

| Summary of Brackish Water In the Hickory Aquifer | | | |
|--|---------------------|---------------------|-------------------------------------|
| <i>Region</i> | <i>Availability</i> | <i>Productivity</i> | <i>Source Water Production Cost</i> |
| F-Region F | Moderate | Moderate | Moderate to High |
| G-Brazos | Unknown | Moderate | Moderate to High |
| J-Plateau | Unknown | Moderate | Moderate to High |
| K-Lower Colorado | Low | Moderate | Moderate to High |
| L-South Central Texas | Unknown | Moderate | Moderate to High |



**GROUNDWATER QUALITY
IN THE HICKORY AQUIFER**

**FIGURE 51
LBG-GUYTON ASSOCIATES**



**SIMPLIFIED CROSS SECTION OF THE HICKORY AQUIFER
WITH GENERALIZED WATER QUALITY RANGES**
(Modified from Barker and others, 1994)

FIGURE 52