

GAM run 03-16

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Texas Water Development Board
Groundwater Availability Modeling Section
(512) 936-2415
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REQUESTOR:

Mr. Dennis Clark, Emerald Underground Water Conservation District

DESCRIPTION OF REQUEST:

Mr. Clark requested the following information from the Edwards-Trinity aquifer Groundwater Availability Model (GAM) for the Emerald Underground Water Conservation District (UWCD):

- Average annual recharge and
- Total available storage as specific yield.

METHODS:

To address the request, we:

- Provided a published estimate of 0.3 inches per year from Iglehart, 1967. This estimate was provided because the model was not yet calibrated in time to meet Mr. Clark's deadline.
- Estimated specific yield of 82.5 million acre-feet for the aquifer(s) from pre-development water level and structural information being used in the GAM study.

PARAMETERS AND ASSUMPTIONS:

None: Data request.

RESULTS:

Recharge

The area of Crockett County was calculated to be 1,792,640 acres. An estimate 0.3 inches per year of recharge for Crockett County (Iglehart, 1967) was used because calibration of the model was not yet complete as of August 2003. The (Iglehart, 1967) estimate was based on the observation that water levels had remained fairly constant over time and thus storage was in equilibrium. Consequently, recharge was then assumed to equal total (natural plus artificial) discharge. Total discharge for the county was estimated to be about 45,000 acre-ft per year.

Aquifer Storage

The total volume of water stored in the aquifer was estimated from GAM model parameters as 82.5 million acre-ft. This number was calculated by:

- subtracting the base elevation of the aquifer from the modeled pre-development water level surface for each model cell,
- multiplying by the specific yield for the cell (estimated as 0.2), and the area of the cell (1 mi²), and
- summing over all of the 2801 cells in Crockett County.

Note: Pre-development water level surface is defined as earliest recorded winter (Nov-Jan) water level data spatially interpolated using a geostatistical method. A check was made to determine if a declining or rising trend existed for water levels within the county and none was found. Therefore, we felt the estimate to be reasonable.

REFERENCES:

Iglehart, H. H., 1967, Occurrence and quality of groundwater in Crockett County, Texas: Texas Water Development Board Report 47, 150 p.