from future ground-water flow models with little loss of accuracy in the upper 1,000 ft of more transmissive materials. Round Valley and the Owens Lake area also were excluded as suggested by Danskin (1988), primarily for computational reasons and because the areas were peripheral to the specific objectives of this study. Future simulation studies with more powerful computer capabilities may find that including both areas is an advantage in analyzing some water-management questions as well as in eliminating the use of specified-flux boundary conditions.

Division of the aquifer system into hydrogeologic units and model layers is more complex and somewhat more arbitrary than the selection of boundary conditions. For this study, the aquifer system was simulated using two model layers. The upper model layer (layer 1) represents hydrogeologic unit 1, the unconfined part of the aquifer system. The lower model layer (layer 2) represents hydrogeologic unit 3, the confined part of the aquifer system. Each model layer is composed of 7,200 cells created by 180 rows and 40 columns (pl. 2, in pocket). The active area of ground-water flow (active model cells) is the same in both model layers.

This division of the aquifer system permits simulation of the measured ground-water levels, which generally are either for shallow wells that monitor unconfined conditions or for deeper wells that monitor a composite confined zone. The use of two layers is consistent with the assumption that both unconfined and confined storage conditions are present in some parts of the valley (fig. 14).

To test the value of additional model layers, a smaller, more detailed ground-water flow model was developed to simulate conditions in the Big Pine area (P.D. Rogalsky, Los Angeles Department of Water and Power, written commun., 1988). Although three layers were used in the model in order to more closely approximate the complex layering of volcanic and fluvial deposits described by Hollett and others (1991), results from the more detailed model were not significantly different from results obtained using the valleywide model.

Hydrogeologic unit 2, as defined by Hollett and others (1991), usually represents either a massive clay bed, such as the blue-green clay near Big Pine (fig. 5, section $B-B'$) or overlapping lenses or beds, which are more typical of the valley fill. The Darcian relation that simulates vertical flow between the model layers was used to approximate the vertically transmissive properties of hydrogeologic unit 2. Storage characteristics of hydrogeologic unit 2 were included in the storage coefficients of the surrounding model layers. This formulation is typical of most models used to simulate ground-water movement in unconsolidated, poorly stratified deposits, such as those in the Owens Valley (Hanson and others, 1990; Berenbrock and Martin, 1991; and Londquist and Martin, 1991).

Along the edge of the basin, the clay beds thin, and hydrogeologic unit 2 virtually disappears (fig. 5, section $C-C'$). In these areas, a high value of vertical conductance was used, allowing water to move between the model layers with minimal resistance. The spatial distribution of vertical conductance and its relation to hydrogeologic model zones are shown on plate 2.

In some parts of the valley, hydrogeologic unit 2 represents volcanic deposits, such as those near Big Pine (section $B-B'$ in fig. 5). The volcanic deposits have a high transmissivity but can restrict the vertical movement of water as a result of the depositional layering of individual volcanic flows. Where faulted or highly