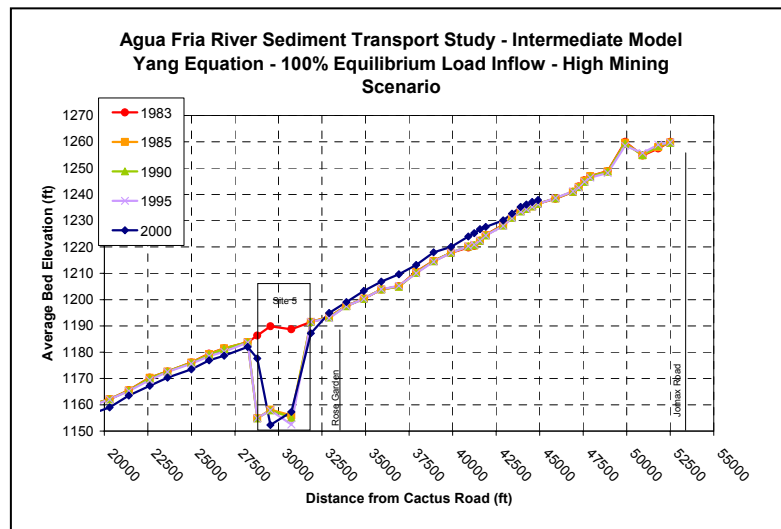




## Agua Fria River Sediment Transport Modeling

WEST Consultants, Inc. (WEST) was retained by the Flood Control District of Maricopa County to conduct a sediment transport study of the Agua Fria River from Cactus Road to Jomax Road, a distance of approximately ten miles. The purpose of the sediment transport study was to develop a sediment model that could be used for a predictive and management tool. The developed sediment transport model will serve to evaluate potential effects on channel stability of bank protection measures, floodplain encroachments and sand and gravel mining operations along the river.

Sediment transport models were created using the computer program HEC-6T. This model is a one-dimensional, movable boundary, open channel flow numerical code, designed to simulate and predict changes in river profiles resulting from scour and/or deposition of sediments over long time periods. HEC-6T is an enhanced version of the U.S. Army Corps of Engineers' HEC-6 model.



The sediment transport modeling effort involved three models. First, an initial baseline model was developed based on topography from 1964-65. A series of simulations were performed using the historical flow records between 1965 and 1982 as inputs to evaluate sediment transport equations and other model options. Simulated profiles were then compared to the profiles recorded in topographic surveys from 1982-83. This comparison was the basis for model calibration.

A second model was then developed from the 1982-83 topography. Using this model and the historical series of flow events from 1983 to 2000 as inputs, simulations were again performed using HEC-6T. Simulated profiles were compared to the current profile obtained from a topographic mapping completed in October 2000. In this case, the analysis was performed to verify the suitability of the selected parameters and sediment transport equations. The largest impact during this period was the continued mining of sand and gravel along and in the river channel. The mining was successfully modeled in the HEC-6T model.

Finally, a third model was developed from the 2000 topography. This model incorporated the modeling methods (equations and parameters) tested in the Initial and Intermediate models. Since this model was based on the most up-to-date geometry, it will be used as the management and prediction tool.

### **Project Owner:**

*Flood Control District of Maricopa County*

*2801 West Durango Street*

*Phoenix, Arizona 85009*

*Contact: Mr. Michael Duncan, P.E.*

*(602) 506-4732*