

MEMORANDUM

June 8, 2001

To: Phil Mutz, P.E., ISC

From: Andy Core, Acting Bureau Chief, Hydrology Bureau *AC*

Re: Navajo Pumping

Per your request, Hydrology Bureau staff performed an analysis of the effects of pumping by irrigators located in the Navajo Nation upon the San Juan and Animas rivers. Eric Keyes constructed a generalized MODFLOW model utilizing data describing quantity of pumping and the formations from which water is abstracted that you provided. Hydraulic parameters for the model were taken from Stone et al (1983). Distribution of the geologic formations was taken from the hydrologic atlas maps for each unit produced by the USGS. Within the model, six layers represent the geologic formations of interest. The abstraction of water in the model was grouped into five (5) pumping centers for ease of plotting.

The resulting effects upon the San Juan and Animas rivers were normalized such that the percentage effect versus time can be read directly from an arithmetic graph. That graph is attached. Should there be any question as to these results, please contact Eric, Tom Morrison or myself.

cc: Tom Morrison
Eric Keyes

In addition to this model, there is a model from the city of Gallup used to show drawdown from an application in that area. It doesn't extend to the San Juan River. Either model may need to be expanded for the purpose of your analysis. Let me know if/when you have specific needs that need to be examined. Eric Keyes

**SAN JUAN AND ANIMAS RIVER IMPACT DUE TO 100 YEARS OF NAVAHO PUMPING
AS PERCENTAGE OF TOTAL NAVAHO PUMPING**

