

**Keywords**

**Theme:** Española Basin; Ancha Formation; elevation contours of formation base; formation thickness

**Place:** Española Basin, Santa Fe embayment, Rio Grande rift, northern New Mexico

**Description**

**Abstract:** The Pliocene-lower Pleistocene Ancha Formation is a sand and gravel that forms the upper portion of the Santa Fe Group basin fill in the southern Española Basin of the Rio Grande rift, northern New Mexico. The Ancha Formation forms a locally important shallow aquifer for the Santa Fe area. The thickness and characteristics of the formation's base are important to regional groundwater studies, and are also useful for other studies involving basin stratigraphy, structure, geophysical interpretations, and basin evolution. The base of the Ancha Formation coincides with a Pliocene erosional surface that bevels tilted and faulted beds of the (upper Oligocene-upper Miocene) Tesuque Formation, the (Oligocene) Espinazo Formation, the (late Paleocene-late Eocene) Galisteo Formation, and, locally, older Mesozoic and Paleozoic units. In order to characterize the thickness and the basal contact of the Ancha Formation, three data sets were evaluated: (1) cuttings, core and/or geophysical logs of key exploration drill holes, monitor wells, and water wells; (2) lower resolution generalized lithologic logs from water wells; and (3) outcrop exposures of the basal contact. These point data are uniquely symbolized to show data type, are labeled with a point ID and elevation of the formation base, and were used to systematically generate the elevation contours of the base of the formation. First, the Ancha Formation basal contact was clearly identified at key sites with cuttings, core, geophysical logs, and/or detailed lithologic logs generated by a geologist. Second, the basal contact was extrapolated to nearby low-resolution lithologic logs from water wells. Third, outcrop exposures of the basal contact were physically mapped and translated to point data. Fourth, the surface elevations of data sites were generated from a 10-m digital elevation model (DEM) and depth to base of formation in wells and drill holes was calculated from surface elevation minus depth to basal contact. Lastly, contours of point data of the formation base were interpolated with a kriging function in ARC INFO 9.2.

**Purpose:** To characterize the base of the Ancha Formation.

**Status of the Data**

The data represent a complete product characterizing the geometry of the basal contact of the Ancha Formation. New wells or exploration drill holes could generate minor changes to the surface. Additional derivative products are forthcoming.

**Time period for which the data are relevant**

The data are not time-dependent and are current through 2008. New wells and exploration drill holes could generate minor changes to the surface.

## **Public Information**

**Who created the data:** Daniel J. Koning (New Mexico Bureau of Geology) interpreted depth to base of Ancha Formation from cuttings, core and/or geophysical logs of key drill holes. Peggy Johnson (New Mexico Bureau of Geology) directed the research and interpreted depth to base of Ancha Formation from lower resolution logs from water wells. Daniel J. Koning and Paul Drakos of Glorieta Geoscience completed geologic maps of the basal contact from outcrop exposures. Brigitte Kludt (New Mexico Bureau of Geology) generated elevations of outcrop exposures of the basal contact in ARCINFO 9.2. Peggy Johnson compiled the entire set of point data and generated surface and basal elevations. Kriging functions were performed by Brigitte Kludt to generate elevation contours and Peggy Johnson manually generated final contours of the formation base.

**Date and time:** Generation of the point data and basal contours spanned several years from 2006-2008. The data are currently unpublished, but released informally to Los Alamos National Laboratory (August 2008) and the U.S. Geological Survey and New Mexico Office of the State Engineer, Hydrology Bureau (August 2009).

### **Constraints on accessing and using the data**

**Access constraints:** None.

**Use constraints:** Users are requested to acknowledge the authors (P. Johnson, D. Koning & B. Kludt, NMBGMR) in any public use of these data.

## **Details about this document**

### **Who completed this document:**

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