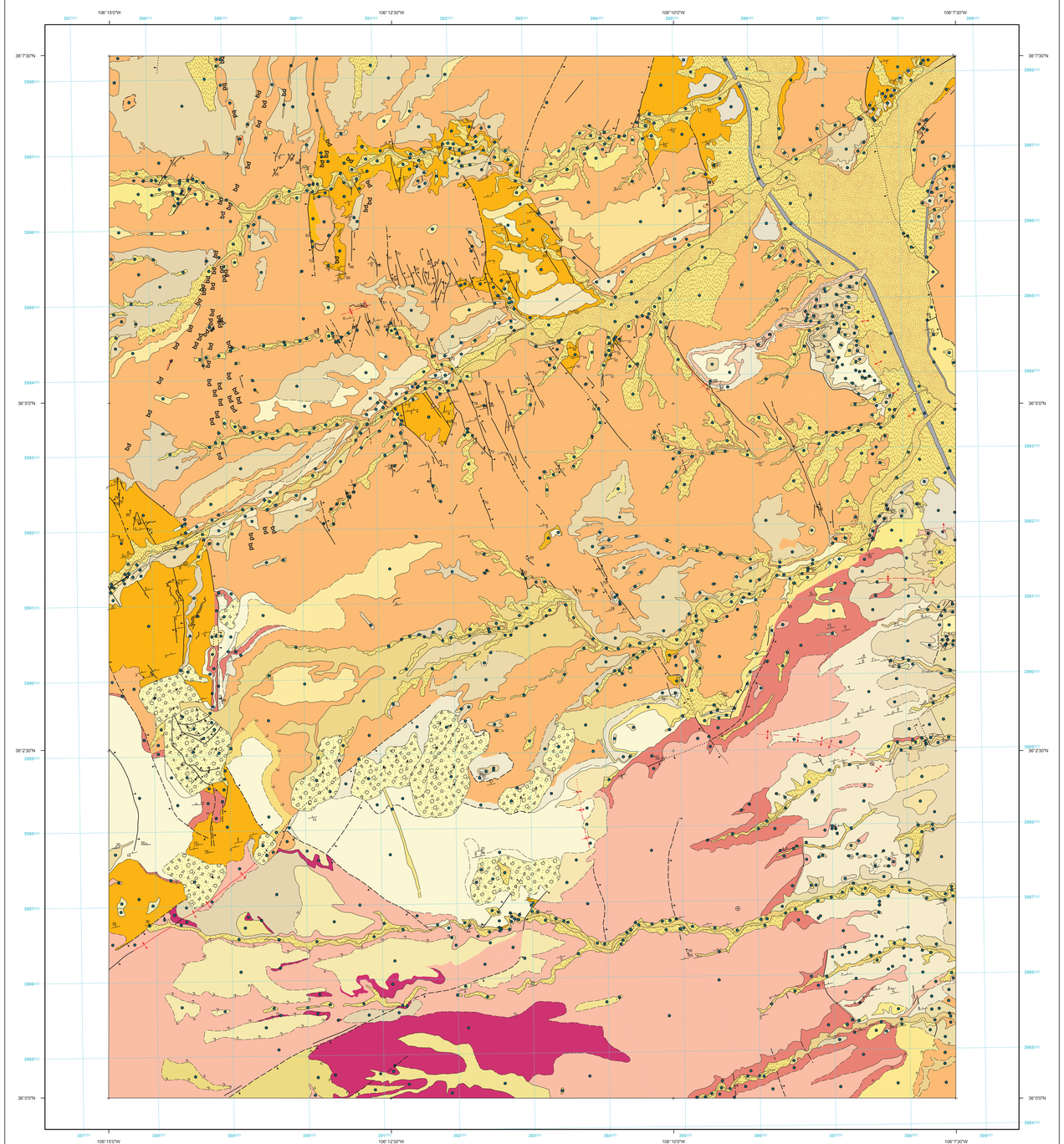

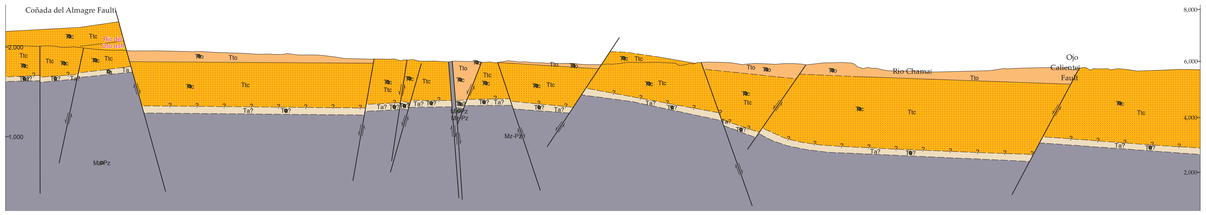

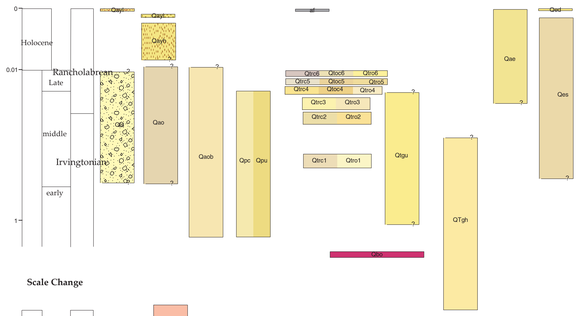

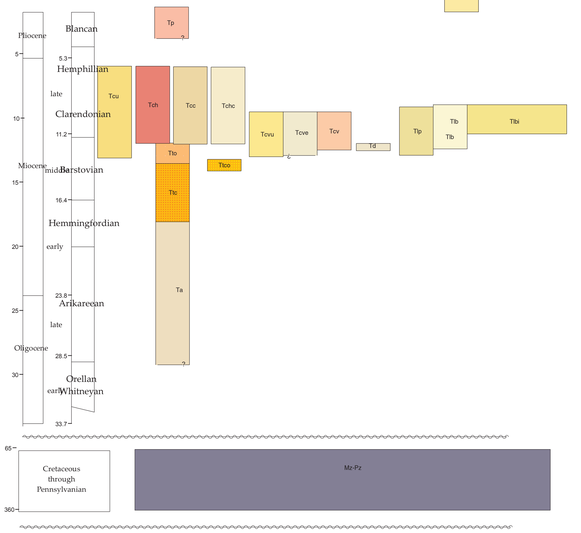

Description of Map

01.01 Unit Qal Artificial fill Compacted sediment, consisting primarily of sand, used for highway fill.

02.01 Unit Qaed Aeolian sand dune deposits Pale brown sand (10YR 6/3) in dunes up to about 2 m tall. Internal bedding not exposed. Sand is subrounded to rounded, well sorted, and consists of quartz with 12-15% pinkish grains (probably mostly potassium fel

02.02 Unit Qaes Aeolian sand deposits, locally reworked by slopewash Strong brown (7.5YR 5/6) fine to medium sand and silty very fine to medium sand. Sediment is in planar or slightly wavy laminations. Silty sand may be in very thin to thin, tabular to bri

02.03 Unit Qls Landslide deposits Landslide complexes on the north side of Cerro Roman and the east side of Santa Clara Peak. These complexes are marked by hummocky topography and by younger, smaller slides inset into older, larger slides. The sediment i

03.01 Unit Qayf Younger alluvium occupying a low topographic position in valley bottoms Sand and gravel that occupy modern channels, floodplains, or slightly elevated (about 1 m or less) areas adjacent to active arroyos. Sand is generally planar-laminate

03.02 Unit Qayf2 Younger alluvium occupying an intermediate topographic position in valley bottoms This unit occupies an intermediate position in valleys between that of units Qayh and Qayf. Its sediment is similar to these other two units, and in many ar

03.03 Unit Qayh2 Younger alluvium occupying a high topographic position in valley bottoms Sand, subordinate silty sand, and subordinate gravel that form low, stable terrace deposits on the floors of valleys or arroyos. Sandy sediment is commonly massive or

03.04 Unit Qaeo Mixed and/or interbedded alluvium with eolian sediment Pale brown to brown (10YR 5-6/3) or very pale brown to light yellowish brown (10YR 6-7/4) silt and very fine to fine sand. Near south boundary of quadrangle may be 5-10% scattered pumi

03.05 Unit Qaeo2 Older alluvium Sandy gravel marked by having abundant boulders of Lobato Basalt. Strath is commonly 1-3 m above the modern stream, but in some drainages the modern stream climbs over the strath of this deposit in an upstream direction (ea

03.06 Unit Qaob Older alluvium adjacent to Cerro Roman with abundant basalt gravel Unit is like that of Qae described above, but gravel is dominantly basalt and soil development may be greater. Unit overlies, and is interbedded with, the Puye Formation a

03.07 Unit Qpc Piedmont sandy gravel on top of Puye Formation with 0.5-3% obsidian clasts Sandy gravel that overlies the Puye Formation in the southern part of the quadrangle. Gravel are subrounded, poorly sorted, and consist of pebbles, cobbles and boul

03.08 Unit Qpu Undifferentiated piedmont gravel on top of Puye Formation Like unit Qpc but we could not confirm whether there was obsidian clasts in the deposit due to land access restrictions.

03.09 Unit Qtgu Uncorrelated gravel deposits Sandy gravel and gravelly sand in terrace deposits adjacent to drainages; their straths are as much as 40-48 m above the adjoining drainages. Gravel includes pebbles and cobbles. Found below the ridge-capping P

03.10 Unit QTgh High-level gravel deposits Sandy gravel preserved on the tops of ridges about 80-120 m above adjoining drainages. Gravel is clast-supported, poorly sorted, subrounded, ranges in size from pebbles to boulders (mostly cobbles and boulders),

04.01 Unit Qtrc1 Terrace deposits along the Rio Chama Sandy gravel axial channel deposits of the Rio Chama in addition to minor floodplain deposits of silt and very fine sand. The gravel consists of pebbles and cobbles that are generally clast-supported,

04.02 Unit Qtrc2 Terrace deposits along the Rio Chama Sandy gravel axial channel deposits of the Rio Chama in addition to minor floodplain deposits of silt and very fine sand. The gravel consists of pebbles and cobbles that are generally clast-supported,

04.03 Unit Qtrc3 Terrace deposits along the Rio Chama Sandy gravel axial channel deposits of the Rio Chama in addition to minor floodplain deposits of silt and very fine sand. The gravel consists of pebbles and cobbles that are generally clast-supported,

04.04 Unit Qtrc4 Terrace deposits along the Rio Chama Sandy gravel axial channel deposits of the Rio Chama in addition to minor floodplain deposits of silt and very fine sand. The gravel consists of pebbles and cobbles that are generally clast-supported,

04.05 Unit Qtrc5 Terrace deposits along the Rio Chama Sandy gravel axial channel deposits of the Rio Chama in addition to minor floodplain deposits of silt and very fine sand. The gravel consists of pebbles and cobbles that are generally clast-supported,

04.06 Unit Qtrc6 Terrace deposits along the Rio Chama Sandy gravel axial channel deposits of the Rio Chama in addition to minor floodplain deposits of silt and very fine sand. The gravel consists of pebbles and cobbles that are generally clast-supported,

04.07 Unit Qtoc4 Terrace deposits along the Rio Ojo Caliente Sand and gravel deposited along the Rio Ojo Caliente in the extreme northeastern part of the quadrangle. No good exposure of the sediment. Gravel is predominately quartzite, but volcanic clasts

04.08 Unit Qtoc5 Terrace deposits along the Rio Ojo Caliente Sand and gravel deposited along the Rio Ojo Caliente in the extreme northeastern part of the quadrangle. No good exposure of the sediment. Gravel is predominately quartzite, but volcanic clasts

04.09 Unit Qtoc6 Terrace deposits along the Rio Ojo Caliente Sand and gravel deposited along the Rio Ojo Caliente in the extreme northeastern part of the quadrangle. No good exposure of the sediment. Gravel is predominately quartzite, but volcanic clasts

04.10 Unit Qtro1 Terrace deposits along the Rio del Oso Sandy gravel deposited along the Rio del Oso, mostly to the north of this drainage. Beds are thin to thick, vague, and lenticular. Gravel are clast-supported, include a well-graded mixture of pebble

04.11 Unit Qtro2 Terrace deposits along the Rio del Oso Sandy gravel deposited along the Rio del Oso, mostly to the north of this drainage. Beds are thin to thick, vague, and lenticular. Gravel are clast-supported, include a well-graded mixture of pebble

04.12 Unit Qtro3 Terrace deposits along the Rio del Oso Sandy gravel deposited along the Rio del Oso, mostly to the north of this drainage. Beds are thin to thick, vague, and lenticular. Gravel are clast-supported, include a well-graded mixture of pebble

04.13 Unit Qtro4 Terrace deposits along the Rio del Oso Sandy gravel deposited along the Rio del Oso, mostly to the north of this drainage. Beds are thin to thick, vague, and lenticular. Gravel are clast-supported, include a well-graded mixture of pebble

04.14 Unit Qtro5 Terrace deposits along the Rio del Oso Sandy gravel deposited along the Rio del Oso, mostly to the north of this drainage. Beds are thin to thick, vague, and lenticular. Gravel are clast-supported, include a well-graded mixture of pebble

04.15 Unit Qtro6 Terrace deposits along the Rio del Oso Sandy gravel deposited along the Rio del Oso, mostly to the north of this drainage. Beds are thin to thick, vague, and lenticular. Gravel are clast-supported, include a well-graded mixture of pebble

04.16 Unit QTp Puye Formation Mostly medium- to thick-bedded and locally thinly bedded gravel, gravelly sand, and minor sand. Most beds are very planar and only locally show minor channel fills. Overall, discrete channel fills are sparse except at basal cP

05.01.01 Unit Qbo Otowi Member of the Bandelier Tuff White to grayish white pumiceous lapilli and coarse ash; clast-to matrix-supported, moderately to poorly sorted, and subrounded. Commonly mixed with minor volcanic detritus and massive. Interpreted as aP

05.02.01 Unit Tlb Basalt flows of the Lobato Formation Dark gray to very dark gray (N 3/ to 4/), mostly finegrained basalt. Contains mafic minerals mostly altered to red opaques (iddingsite) that are both rectangular and diamondshaped (pyroxene + olivine P

05.02.02 Unit Tlbi Intrusive basalt bodies of Lobato Formation Dark gray to gray (N 4/ to 5/) basalt that weathers brown (7.5YR 5/2-3). Composed of abundant plagioclase and unidentified mafic minerals (no biotite). Crystals are 1-2 mm long and elongated.

05.02.05 Unit Tlp Phreatomagmatic deposits associated with the Lobato Formation Very thin to medium beds of very poorly sorted, fine to very coarse sand and very fine to very coarse pebbles of basalt. Y5% basaltic cobbles. Sand consists of Ojo Caliente SP

06.01.01 Unit Tch Hernandez Member of the Chamita Formation Interbedded floodplain deposits and coarse channel fills. The floodplain deposits commonly are grayish brown (10YR 6-7/2; 2.5Y 5-7/2) to light yellowish brown (10YR 6/4) to very pale brown (10YRP

06.01.02 Unit Tcc Cejita Member of the Chamita Formation This unit extends from the Tesuque Formation east of the Rio Grande to the Chamita Formation west of the Rio Grande, as proposed by Koning and Aby (in press). It is composed of light brown to lightP

06.01.03 Unit Tchc Interfingering Cejita and Hernandez Members of the Chamita Formation See descriptions of the individual units. Individual members in this interfingering zone are generally more than 3 m thick.

06.01.04 Unit Tcv Vallito Member of the Chamita Formation, undivided Very pale brown, light yellowish brown, light brown, and pink sand and silty sand, with minor lenses of very fine to medium pebbles. In most places, this member can be subdivided into P

06.01.05 Unit Tcv Upper fluvial part of Vallito Member of the Chamita Formation Medium to very thick, tabular beds of silty sand; pink to very pale brown (7.5-10YR 7/4) and light yellowish brown (10YR 6/4). Sediment is also massive. Sand is very fine to P

06.01.06 Unit Tcve Lower part of Vallito Member of the Chamita Formation, contains interbeds of eolian sandstone Generally massive or in medium to thick, tabular beds. Internal bedding is massive or else planar-laminated to very thin beds; local cross-laP

06.01.07 Unit Tcu Undifferentiated Chamita Formation Interfred Vallito, Cejita, or Hernandez Members of the Chamita Formation in areas of very poor exposures. Estimate 60-90 m thick.

06.01.08 Unit Tlb Undifferentiated Chamita Formation interbeded with Lobato Basalt Interred Vallito, Cejita, or Hernandez Members of the Chamita Formation that are interbedded with Lobato Basalt flows in areas of very poor exposures. Approximate thicknessP

06.01.09 Unit Td Diatomite White to light gray, chalky-textured, diatomite that is laminated or in very thin-thin beds; locally relatively massive. Local interbeds of gray, fine ash up to 30 cm thick. Exposed as a crescent-shape 2 km southeast of the enP

06.02.01 Unit Tlo Ojo Caliente Sandstone Member of the Tesuque Formation Extensively cross-stratified sand. Sand is generally very pale brown (10YR 8/2 to 7/3) to white (10YR 8/1), fine-upper to coarse-lower in grain size, rounded to subangular (mostly sP

06.02.02 Unit Tloo Interbedded Ojo Caliente Sandstone Chama-El Rito Member, Tesuque Formation Please see descriptions of the Ojo Caliente Sandstone and Chama-El Rito Member. This unit is designated for areas where these two units are interbedded. ThicknesP

06.02.03 Unit Tlo Chama-El Rito Member, Tesuque Formation Pink to very pale brown (7.5-10YR 7/3-4), very fine to medium sand (mostly fine sand) and silty sand interbedded with minor volcaniclastic sandy pebbles and pebbly sand; there are also local silt lP

07.01 Unit Ta Abiquiu Formation Not known if this unit extends to the line of cross-section A-A . If it does, it may be a whitish sand with minor felsic-intermediate pebble beds (based on exposures of this unit near Abiquiu).

07.02 Unit Mz-Pz Undivided Mesozoic and Paleozoic strata Sandstone, limestone, siltstone, and shale.

Base map from U.S. Geological Survey 2010
North American Datum of 1983 (NAD83) World Geodetic System of 1984 (WGS84).
Projection and 1000-meter grid: Universal Transverse Mercator, Zone 13S
10 000-foot ticks: New Mexico Coordinate System of 1983(west zone), shown in blue.

Roads.....©2006-2010 Tele Atlas
Names.....GNIS, 2008
Hydrography.....National Hydrography Dataset, 2008
Contours.....National Elevation Dataset, 2000

Magnetic Declination
June, 2004
10° 13' East
At Map Center

1:24,000

1 0.5 0 1 Mile

1000 0 1000 2000 3000 4000 5000 6000 7000 Feet

1 0.5 0 1 Kilometer

Contour Interval 20 Feet

North American Vertical Datum of 1988

Quadrangle Location

New Mexico Bureau of Geology and Mineral Resources
New Mexico Tech
801 Leroy Place
Socorro, New Mexico
87801-4796

[575] 835-5490

This and other STATEMAP quadrangles are available for free download in both PDF and ArcGIS formats at:

http://geoinfo.nmt.edu

Digital layout and cartography by the NMBGMR Map Production Group:
Phil Miller
David J. McCraw
Elizabeth H. Tysor

New Mexico Bureau of Geology and Mineral Resources
New Mexico Tech
Earth Science for the 21st Century

STATEMAP

New Mexico Bureau of Geology and Mineral Resources
Open-File Geologic Map 103

Mapping of this quadrangle was funded by a matching-funds grant from the STATEMAP program of the National Cooperative Geologic Mapping Act, administered by the U. S. Geological Survey, and by the New Mexico Bureau of Geology and Mineral Resources, Matthew J. Rhoades, *Director and State Geologist*, Dr. J. Michael Timmons, *Assoc. Director for Mapping Programs*).

Geologic Map of the Chili 7.5-Minute Quadrangle, Rio Arriba County, New Mexico

May, 2005

by
Koning, Daniel J. [1]; Skotnicki, Steven J. [2]; Kelly, Shari A. [1]; Moore, Jessica [3]

[1]*New Mexico Bureau of Geology and Mineral resources, 801 Leroy Pl., Socorro, NM, 87801*
[2] *Arizona State University, Gilbert, AZ 85233*
[3] *Department of Earth and Planetary Sciences, UNM, Albuquerque, NM, 87131*

This draft geologic map is preliminary and will undergo revision. It was produced from either scans of hand-drafted originals or from digitally drafted original maps and figures using a wide variety of software, and is currently in cartographic production. It is being distributed in this draft form as part of the bureau's Open-file map series (OFGM), due to high demand for current geologic map data in these areas where STATEMAP quadrangles are located, and it is the bureau's policy to disseminate geologic data to the public as soon as possible.

After this map has undergone review, editing, and final cartographic production adhering to bureau map standards, it will be released in our Geologic Map (GM) series. This final version will receive a new GM number and will supercede this preliminary open-file geologic map.

DRAFT

Comments to Map Users

A geologic map displays information on the distribution, nature, orientation, and age relationships of rock and deposits and the occurrence of structural features. Contacts and fault contacts are irregular surfaces that form boundaries between different types or ages of units. Data depicted on this geologic quadrangle map may be based on any of the following: reconnaissance field geologic mapping, compilation of published and unpublished work and photogeologic interpretation. Locations of contacts are not surveyed, but are plotted by interpretation of the position of a given contact onto a topographic base map; therefore, the accuracy of contact locations depends on the scale of mapping and the interpretation of the geologist(s). Any enlargement of this map could cause misunderstanding in the detail of mapping and may result in erroneous interpretations. Site-specific conditions should be verified by detailed surface mapping or subsurface exploration. Topographic and cultural changes may not be shown due to recent development.

Cross sections are constructed based upon the interpretations of the author made from geologic mapping, and available geophysical, and subsurface (drillhole) data. Cross sections should be used as an aid to understanding the general geologic framework of the map area, and not be the sole source of information for use in locating or designing wells, buildings, roads, or other man-made structures.

The New Mexico Bureau of Geology and Mineral Resources created the Open-file Geologic Map Series to expedite dissemination of these geologic maps and map data to the public as rapidly as possible while allowing for map revision as geologists continued to work in map areas. Each map sheet carries the original date of publication below the map as well as the latest revision date in the upper right corner. In most cases, the original date of publication coincides with the date of the map product delivered to the National Cooperative Geologic Mapping Program (NCGMP) as part of New Mexico's STATEMAP agreement. While maps are produced, maintained, and updated in an ArcGIS geodatabase, at the time of the STATEMAP deliverable, each map goes through cartographic production and internal review prior to uploading to the Internet. Even if additional updates are carried out on the ArcGIS map data files, citations to these maps should reflect this original publication date and the original authors listed. The views and conclusions contained in these map documents are those of the authors and should not be interpreted as necessarily representing the official policies, either expressed or implied, of the State of New Mexico, or the U.S. Government.