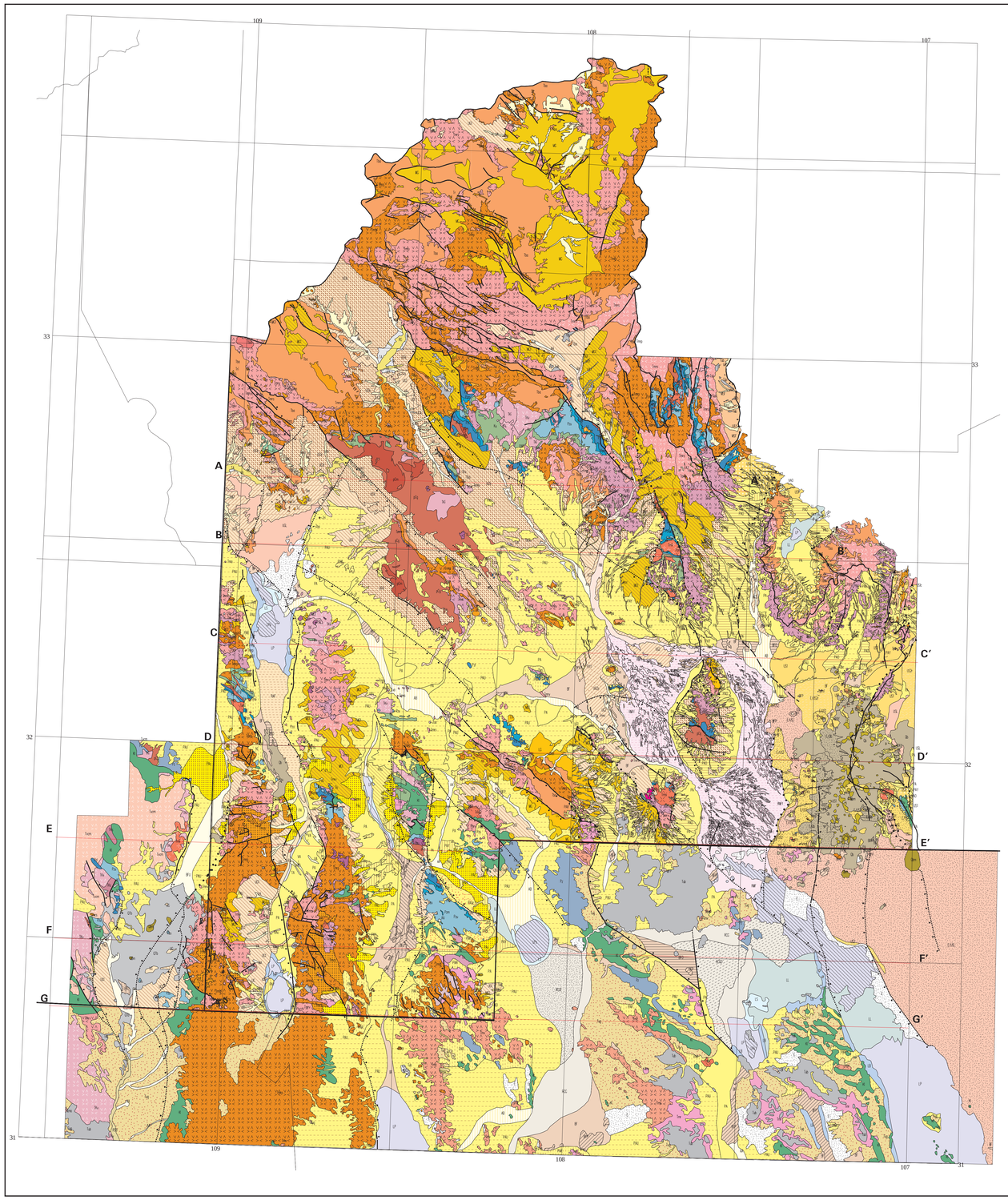
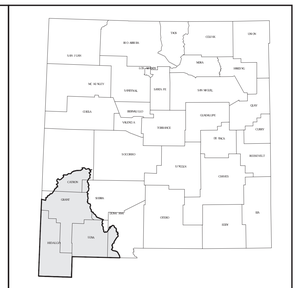
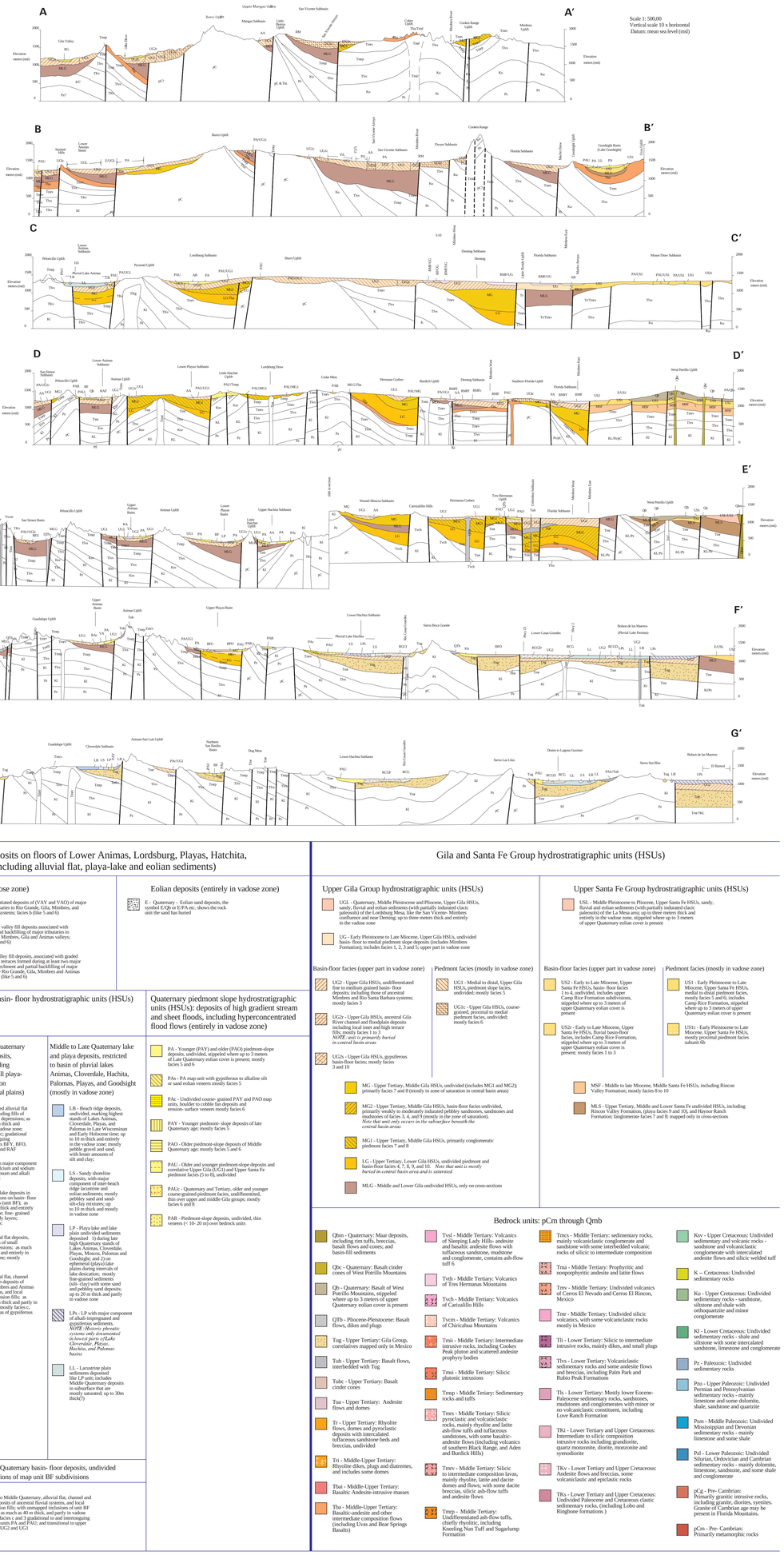




Location of study area within southwestern New Mexico

Cross-section index



BASE MAP DATA: New Mexico Resource Geographic Information System Program, 1998, CD-ROM6, Volume 1, version 2.

COMPILED BY: NM Water Resources Research Institute, March 1999. New Mexico State University, Las Cruces, New Mexico.

DATUM: Universal Transverse Mercator. Zone 13. NAD27, CLARKE1866.

SCALE 1: 500 000

10 0 10 20 30 40 50 MILES

10 0 10 20 30 40 50 KILOMETERS

N W E S

Geology Compilation by John Hawley

Cartography Compilation by John F. Kennedy, Molly Johnson, Phil Dinterman, and Jared Martin

References

Bromfield, C.S., and Wrucke, C.T., 1961, Reconnaissance geologic map of the Cedar Mountains, Grant and Luna counties, New Mexico: U.S. Geological Survey Mineral Investigations Field Studies Map MF-178, scale 1:62,500.

Bryan, C.R., 1995, Stratigraphy, chemistry and petrogenesis of volcanic rocks of the mid-Tertiary Boot Heel volcanic field, southwestern New Mexico and southeastern Arizona: Ph.D. thesis, New Mexico State University, 272 p.

Bryan, C.R., 1988, Geology and geochemistry of mid-Tertiary volcanic rocks in the eastern Chiricahua Mountains, southeastern Arizona: Unpublished M.S. thesis, University of New Mexico, Albuquerque, 137 p.

Clemons, R.E., 1979, Geology of Good Sight Mountains and Uvas Valley, southwest New Mexico: New Mexico Bureau of Mines and Mineral Resources Circular 169, 31 p.

Clemons, R.E. and Mack, G.H., 1988, Geology of southwestern New Mexico: New Mexico Geological Society, 39th Field Conference, p. 45-51.

Clemons, R.E., 1998, Geology of the Florida Mountains, southwestern New Mexico: New Mexico Bureau of Mines and Mineral Resources, Memoir 43, 112 p.

Cooper, J.R., 1959, Reconnaissance geologic map of southeastern Cochise County, Arizona: U.S. Geological Survey Mineral Investigations Field Studies Map MF-213, scale 1:125,000.

Cox, D. H., 1973, Soil Survey of Hidalgo County, New Mexico; with a section on climate by F. E. Houghton (p 86-88): U.S. Department of Agriculture, Soil Conservation Service and Forest Service, Superintendent of documents, U.S. Government Printing Office, Washington D.C. 20402, 90 p. 100 map sheets.

DGGTN, no date a, Agua Prieta H12-3, Cartas Geológica, Escala 1:250,000: Direccion General de Geografia del Territorio Nacional

DGGTN, no date b, Agua Prieta H12-3, Cartas Hidrologica de Aguas, Escala 1:250,000: Direccion General de Geografia del Territorio Nacional

DGGTN, no date c, Agua Prieta H12-3, Cartas Topografica, Escala 1:250,000: Direccion General de Geografia del Territorio Nacional

DGGTN, no date d, C.D. Juarez H13-1, Cartas Geológica, Escala 1:250,000:

DGGTN, no date e, C.D. Juarez H13-1, Cartas Hidrologica de Aguas, Escala 1:250,000: Direccion General de Geografia del Territorio Nacional

DGGTN, no date f, C.D. Juarez H13-1, Cartas Topografica, Escala 1:250,000: Direccion General de Geografia del Territorio Nacional

Darton, N.H., 1916, Geology and underground water of Luna County, New Mexico: U.S. Geological Survey Bulletin 618, 188 pp.

Darton, N.H., 1933, Guidebook of the western United States, Part F, The Southern Pacific Lines, New Orleans to Los Angeles: U.S. Geological Survey Bulletin 845, 304 p., 29 route maps.

Deal, E.G., Elston, W.E., Erb, E.E., Peterson, S.L., Reiter, D.E., Damon, P.E., and Shafiqullah, M., 1978, Cenozoic volcanic geology of the Basin and Range province in southern Hidalgo County, southwestern New Mexico: New Mexico Geological Society, 29th Annual Field Conference, Guidebook, p. 219-229

Drewes, H., 1980, Tectonic map of southeast Arizona: U.S. Geological Survey, Miscellaneous Investigations Map I-1109, scale 1:125,000.

Drewes, H., Houser, B.B., Hedlund, D.C., Richter, D.H., Thorman, C.H., and Finnell, T.L., 1985, Geologic map of the Silver City 1x2 degree Quadrangle, New Mexico and Arizona: U.S. Geological Survey Miscellaneous Investigations Series Map, I-1310-C, scale 1:250,000.

Elston, W.E., Deal, E.G., and Logsdon, M.J., 1983, Geology and geothermal waters near the Lightning Dock region, Animas Valley and Pyramid Mountains, Hidalgo County, New Mexico: New Mexico Bureau of Mines and Mineral Resources Circular 177, 44 p.

Erb, E.E., 1979, Petrologic and structural evolution of ash-flow tuff cauldrons and noncauldron related volcanic rocks in the Animas and southern Peloncillo Mountains, Hidalgo County, New Mexico: Ph.D. thesis, University of New Mexico, (map scale 1:62,500), 286 p.

Fleischhauer, H.L., Jr. and Stone, W.J., 1982, Quaternary geology of Lake Animas, Hidalgo County, New Mexico: New Mexico Bureau of Mines and Mineral Resources, Circular 174, 25 p.

Gilbert, G.K., 1875, Report on the geology of portions of New Mexico and Arizona: United States Geographic and Geologic Survey West of the 100th Meridian (Wheeler Survey), v. 3, p. 501-567.

Hawkins, D.B., 1981, Geohydrology of the lower Animas Valley, Hidalgo County, New Mexico, A computer simulation study: Socorro, New Mexico Institute of Mining and Technology, unpublished M.S. thesis, 105.

Hawkins, D.B., and Stephens, D.B., 1983, Ground-water modeling in a southwestern alluvial basin: Ground Water, v. 21, no.6, p. 733-739.

Hawley, J.W., 1969, Notes on the geomorphology and late Cenozoic geology of northwestern Chihuahua: New Mexico Geological Society, 20th Annual Field Conference, Guidebook, p. 131- 142.

Hayes, P.T., 1982, Geologic map of Bunk Robinson Peak and Whitmire Canyon roadless areas, Coronado National Forest, New Mexico and Arizona: U.S. Geological Survey Miscellaneous Field Study MF-1425-A, scale 1:62,500.

Heindl, L.A., 1963, Cenozoic geology in the Mammoth area, Pinal County, Arizona: United States Geological Survey Bulletin 1141-E, 40 p.

Kempton, P.D. and Dungan, M.A., 1989, Geology and petrology of basalts and included mafic, ultramafic and granulitic xenoliths of the Geronimo volcanic field, southeastern Arizona, in Chapin, C.E. and Zidek, J (eds.), Field excursions to volcanic terranes in the western United States, vol. I: Southern Rocky Mountain Region: New Mexico Bureau of Mines and Mineral Resources, Memoir 46, p. 161-173.

Leopoldt, W., 1981, Neogene Geology of the Central Mangas Graben, Cliff-Gila Area, Grant County, New Mexico: M.S. thesis, University of New Mexico, 160 p.

Lynch, D.J., 1973, Reconnaissance geology of the Bernardino volcanic field, Cochise County, Arizona: M.S. thesis, University of Arizona, Tucson, 101p.

Machette, M.N., Personius, S.F., Menges, C.M., and Pearthree, P.A., 1986, Map showing Quaternary and Miocene faults in the Silver City Quadrangle, Southeastern Arizona and Southwestern New Mexico: U.S. Geological Survey Miscellaneous Field Studies Map MF-1466-C, scale 1:250,000. 20 p.

Maker, H. J., Bailey, O. F., and Anderson, J. V., 1970, Soil Association and land classification, Luna County; with section on climate by F. E Houghton (p. 6-7): New Mexico State University, Agriculture Experiment Station Research Report 176, 31 p.

Maker, H.J., Cox, D.N., and Anderson, J.V., 1970, Soil Associations and land classification for irrigation, Hidalgo County; with section on climate by F.E. Houghton (p. 6-7): Bid. Research Report 177, 28 p.

Maker, H. J., Neher, R. E., Dent, P. H., and Anderson, J. U., 1971, Soil Associations and land classification for irrigation, Dona Ana County; with section on climate by F. E Houghton (p. 5-8): Bid. Research Report 183, 41 p.

Maker, H. J., Neher, R. E., and Anderson, J. U., 1971, Soil Associations and land classification for irrigation, Grant County; with section on climate by F. E. Houghton (p. 8-9): Bid. Research Report 200. 43 p.

Maker, H. J., Neher, R. E., and Anderson, J. U., 1972, Soil Associations and land classification for irrigation, Catron County; with section on climate by F. E. Houghton (p. 6-8): Bid. ResearchReport 229.

Menges, C.M. and Pearthree, P.A., 1983, Map of neotectonic (latest Pliocene-Quaternary) deformation in Arizona: Arizona Bureau of Geology and Mineral Technology Open-file Report 83-22, 48 p., scale 1:500,000, 2 sheets.

Morrison, R. B., 1969, Photointerpretive mapping from space photographs of Quaternary geomorphic features and soil associates in northern Chihuahua and adjoining New Mexico and Texas: New Mexico Geological Society 20th Field Conference, Guidebook, p. 116-129.

Pool, D.R., 1985, Aquifer geology of alluvial basins of Arizona, in Anderson, T.W., and Johnson, A.I., eds., Regional aquifer systems of the United States, southwest alluvial basins of Arizona: American Water Resources Association Monograph, Series 7, p. 25-36.

Ratte, J.C., Gaskill, D.L., Eaton, G.P., Peterson, D.L., Stotelmeyer, R.B. and Meeves, H.C., 1979, Mineral resources of the Gila primitive area and Gila Wilderness, Catron and Grant Counties, New Mexico: United States Geological Survey Bulletin, v. 1451, 229 p.

Reeves, C.C., Jr., 1969, Pluvial Lake Palomas, northwestern Chihuahua, Mexico: New Mexico Geological Society, 20th Annual Field Conference, Guidebook, p. 143-154.

Robinson, B.R. and Clark, K.F., 1983, Reconnaissance geology of the Sierra Alta-Boca Grande area, Chihuahua, Mexico: El Paso Geological Society, Field Trip on the Border region, p. 62-63.

Scarborough, R.B., Menges, C.M. and Pearthree, P.A., 1986, Map of late Pliocene-Quaternary (post 4 m.y.) faults, folds, and volcanic outcrops in Arizona: Arizona Bureau of Geology and Mineral Technology Map 22, scale 1:1,000,000.

Seager, W.R., R.E. Clemons, J.W. Hawley, and R.E. Kelley, 1971, Geology of San Diego Mountain Area, Dona Ana County, New Mexico: NM Bureau of Mines and Mineral Resources, Bulletin 97. 38 pp.

Seager, W.R. and Morgan, P., 1979, Rio Grande rift in southern New Mexico, West Texas, and northern Chihuahua; in Riecker, R.E. (ed.), Rio Grande rift: Tectonics and magmetism: American Geophysical Union, Washington, D.C., p. 87-106.

Seager, W.R., Clemons, R.E., Hawley, J.W., and Kelley, R.E., 1982, Geology of the northwest part of Las Cruces 1x2 degree quadrangle, New Mexico Bureau of Mines and Mineral Resources Geologic Map GM-53, scale 1:125,000.

Seager, W.R., M. Shafiqullah, J.W. Hawley, and R.F. Marvin, 1984, New K-Ar dates from basalts and evolution of the southern Rio Grande Rift: Geological Society of America Bulletin, 95:87-99.

Seager, W.R., Hawley, J.W., Kottlowski, F.E., and Kelley, S.A., 1987, Geology of the east half of Las Cruces and northeast El Paso 1x2 degree sheets, New Mexico: New Mexico Bureau of Mines and Mineral Resources Geologic Map GM-57, scale 1:125,000.

Seager, W.R., and Clemons, R.E., 1988, Geology of Hermanas quadrangle, Luna County, New Mexico: New Mexico Bureau of Mines and Mineral Resources, Socorro, NM, text, scale 1:24000, GM-63.

Seager, W.R., 1989, Geologic beneath and around the West Potrillo Basalts, Dona Ana and Luna Counties, New Mexico: New Mexico Geology, v. 11, no. 3, p. 53-58.

Seager, W.R., 1995, Geologic map of the southwest part of Las Cruces and northeast part of El Paso 1x2 degree sheets, New Mexico: New Mexico Bureau of Mines and Mineral Resources Geologic Map GM-60, scale 1:125,000.

Seager, W.R., Mack, G.H. and Lawton, T.F., 1997, Structural kinematics and depositional history of a Laramide uplift-basin pair in southern New Mexico: implications for development of intraforeland basins: Geological Society of America Bulletin, v. 109, p. 1389-1401.

Traeger, F.D., 1972, Water Resources and General Geology of Grant County, New Mexico; Hydrologic Report 2: New Mexico Bureau of Mines and Mineral Resources, Socorro, 1972, 211 p. plus Geologic Map and Well Loc. and Water Level Controus Map.

Vincent, K.R. and Krider, P.R., 1998, Geomorphic surface maps of the southern Animas Valley, Hidalgo Co., New Mexico: New Mexico Bureau of Mines and Mineral Resources Open-File Report OF-429, 14 plates, 60 p.

Wrucke, C.T. and Bromfield, C.S., 1961, Reconnaissance geologic map of part of the southern Peloncillo Mountains, Hidalgo County, New Mexico: U.S. Geological Survey Miscellaneous Field Studies Map MF-0160.

Zeller, R.A., Jr., 1958, Reconnaissance geologic map of Dog Mountain quadrangel: New Mexico Bureau of Mines and Mineral Resources, Geologic Map 8, scale 1:62,500.

Zeller, R.A., Jr., 1959, Reconnaissance geologic map of Playas 15' quadrangle: New Mexico Bureau of Mines and Mineral Resources Geologic Map 7, scale 1:62,500.

Zeller, R.A., Jr., 1962, Reconnaissance geologic map of the southern Animas Mountains: New Mexico Bureau of Mines and Mineral Resources Geologic Map 17.

Zeller, R.A., Jr. and Alper, A.M., 1965, Geology of the Walnut Wells quadrangle, Hidalgo County, New Mexico: New Mexico Bureau of Mines and Mineral Resources Bulletin 84, 105 p.

Zeller, R.A., 1970, Geology of the Little Hatchet Mountains, Hidalgo and Grant Counties, New Mexico: New Mexico Bureau of Mines and Mineral Resources Bulletin 96, 23 p.

Zeller, R.A., Jr., with commentary by Sam Thompson, III, 1975, Structural geology of Big Hatchet Peak quadrangle, Hidalgo County: New Mexico: New Mexico Bureau of Mines and Mineral Resources Circular 146, 23p., scale 1:48,000.

Post Gila and Santa Fe Group deposits on floors of Lower Animas, Lordsburg, Playas, Hatchita, Mimbres and Goodsight basins (including alluvial flat, playa-lake and eolian sediments)

Alluvial deposits of major ephemeral streams (entirely in vadose zone)

- AA - Alluvial deposits in axial arroyo channel systems; facies b (like Sa)
- AB - Unchanneled alluvial deposits of axial basin floodwaysfacies b and c; (like 3)
- AR - Arroyo channel fills in major valley tributaries to axial fluvial systems facies b (like Sa and 6a)
- AU - Alluvium in mountian upland drainage basins; facies b (like 5 and 6)
- VA - Undifferentiated deposits of (VAY and VAO) of major ephemeral tributaries to Rio Grande, Gila, Mimbres, and Animas fluvial systems; facies b (like 5 and 6)
- VAY - Younger valley fill deposits associated with entrenchment and backfilling of major tributaries to the Rio Grande, Mimbres, Gila and Animas valleys; facies b (like 5 and 6)
- VAO - Older valley fill deposits, associated with graded surface fans and terraces formed during at least two major episodes of entrenchment and partial backfilling of major tributaries to the Rio Grande, Gila, Mimbres and Animas valleys; facies b (like 5 and 6)

Eolian deposits (entirely in vadose zone)

- E - Quaternary - Eolian sand deposits, the symbol EQb or E/PA etc. shows the rock unit the sand has buried

Late Quaternary fluvial hydrostratigraphic units (HSUs): deposits of major streams with perennial or intermittent flow regimes

- RG - Channel, floodplain and low terrace deposits of the Gila River; up to 30 m saturated thickness; facies a1 and a2
- RCG - Channel, floodplain and low terrace deposits of the Rio Casas Grandes; mostly facies a and b
- RCGF - Fluvial fan of the Rio Casas Grandes; channel, floodplain and low terrace deposits; mostly facies a3 and c
- RCGD - Rio Casas Grandes Delta; mixed facies a and c
- RSB - Channel, floodplain and low terrace deposits of the Rio San Bernardino mixed facies a
- RMr - Channel, floodplain and low terrace deposits of the upper Mimbres River, fluvial facies; up to 10 m saturated thickness; mostly facies a2
- RM - Channel, floodplain and low terrace deposits of the lower Mimbres River; mostly facies a and b
- RMF - Fluvial- fan deposits of the ancestral and modern Mimbres River, undivided; up to 20 m thick and primarily in vadose zone; facies a
- RMFc - Fluvial- fan deposits of the Mimbres River, course-grained facies; mostly facies a2
- RMFf - Fluvial- fan deposits of the Mimbres River, fine-grained facies; mostly facies a3 and c; includes extensive gypsiferous and alkali impregnated sediments in the Florida subbasin
- RA - Channel, floodplain and low terrace deposits of the lower Animas River; up to 15 m thick, and primarily in the vadose zone; mostly facies a
- RAc - Channel floodplain and low terrace deposits of the upper Animas River; mostly facies c
- RAF - Basin- floor and fluvial fan deposits of the ancestral and modern Animas River, undivided; up to 50m thick, mostly facies a2 and a3; includes increasing proportion of gypsiferous and alkali impregnated sediments in lower most part of Animas Valley; facies c
- CA - Cienega (relict wet meadow) deposits of ancestral Animas River floodplain; up to 15 m thick and partly saturated; mostly marls, organic layers and facies a3 and c
- TA - Quaternary, terrace deposits of Upper Gila River; mostly facies a1 entirely in the vadose zone

Quaternary basin- floor hydrostratigraphic units (HSUs)

Middle to Late Quaternary Alluvial-flat deposits, undivided (including sediments of small playa-lake depressions on basin-floor alluvial plains)

- BF - Undivided alluvial flat deposits, including fills of small "playa" depressions; as much as 30 m thick and primarily in vadose zone; mostly facies c; gradational to or interfingering with map units BFY, BFO, BFU, RMF, and RAF
- BFs - BF with major component of hydrous calcium and sodium sulphates (gypsum and alkali salts); facies c
- BFP - Playa- lake deposits in local depressions on basin- floor alluvial plains (unit BF); as much as 5 m thick and entirely in vadose zone; fine- grained with thin-sandy layers; mostly facies c
- BFY - Alluvial flat deposits, including fills of small "playa" depressions; as much as 10 m thick and entirely in the vadose zone; mostly facies c
- BFO - Alluvial flat, channel and floodplain deposits of ancestral Mimbres and Animas fluvial systems, and local "playa" depression fills; as much as 20 m thick and party in vadose zone; mostly facies c, with local areas of gypsiferous sediments

Middle to Late Quaternary lake and playa deposits, restricted to basin of pluvial lakes Animas, Cloverdale, Hachita, Palomas, Playas, and Goodsight (mostly in vadose zone)

- LB - Beach ridge deposits, undivided, marking highest stands of Lakes Animas, Cloverdale, Playas, and Palomas and Lake Guzman and Early Holocene time; up to 10 m thick and entirely in the vadose zone; mostly pebble gravel and sand, with lesser amounts of silt and clay;
- LS - Sandy shoreline deposits, with major component of inter-beach ridge lacustine and eolian sediments; mostly pebbley sand and sand-silt-clay mixtures; up to 10 m thick and mostly in vadose zone
- LP - Playa lake and lake plain undivided sediments deposited 1) during late high Quaternary stands of Lakes Animas, Cloverdale, Playas, Mimbres, Palomas and Goodsight; and 2) on playas and lake plains during Holocene time; mostly fine-grained sediments (silt- clay) with some sand and pebbley sand deposits; up to 20 m thick and partly vadose zone
- LPs - LP with major component of alkali-impregnated and gypsiferous sediments. *NOTE: Historic phreatic systems only documented in lowest parts of Lake Cloverdale , Playas , Hachita , and Palomas basins*
- LL - Lacustrine plain sediments deposited like LP unit; includes Middle Quaternary deposits in subsurface that are mostly saturated; up to 30m thick(?)

Quaternary piedmont slope hydrostratigraphic units (HSUs): deposits of high gradient stream and sheet floods, including hyperconcentrated flood flows (entirely in vadose zone)

- PA - Younger (PAY) and older (PAO) piedmont-slope deposits, undivided, stippled where up to 3 meters of Late Quaternary eolian cover is present; mostly facies 5 and 6
- PAc - PA map unit with gypsiferous to alkaline silt or sand eolian veneers mostly facies 5
- PAc - Undivided course- grained PAY and PAO map units, boulder to cobble fan deposits and erosional surface veneers mostly facies 6
- PAY - Younger piedmont- slope deposits of late Quaternary age; mostly facies 5
- PAO - Older piedmont-slope deposits of Middle Quaternary age; mostly facies 5 and 6
- PAU - Older and younger piedmont-slope deposits and correlative Upper Gila (UG1) and Upper Santa Fe piedmont facies (5 to 8), undivided
- PALc - Quaternary and Tertiary, older and younger course-grained piedmont facies, undifferentiated, thin over upper and middle Gila groups; mostly facies 6 and 8
- PAR - Piedmont-slope deposits, undivided, thin veneers (< 10- 20 m) over bedrock units

Early to Middle Quaternary basin- floor deposits, undivided with local inclusions of map unit BF subdivisions

- BFU - Early to Middle Quaternary, alluvial flat, channel and floodplain deposits of ancestral fluvial systems, and local playa-depression fills; with unmapped inclusions of unit BF in upper part; as much as 40 m thick, and partly in vadose zone; mostly facies c and 3 gradational to and interfingering laterally with units PA and PAU, and transitional to upper part of HSUs UG2 and UG1

Gila and Santa Fe Group hydrostratigraphic units (HSUs)

Upper Gila Group hydrostratigraphic units (HSUs)

- LGL - Quaternary, Middle Pleistocene and Pliocene, Upper Gila HSUs, sandy, fluvial and eolian sediments (with partially indurated clacic paleosols) of the Lordsburg Mesa, like the San Vicente- Mimbres confluence and near Deming; up to three meters thick and entirely in the vadose zone
- LG - Early Pretiocene to Late Miocene, Upper Gila HSUs, undivided basin- floor to medial piedmont slope deposits (includes Mimbres Formation); includes facies 1, 2, 3 and 5; upper part in vadose zone

Basin-floor facies (upper part in vadose zone)

- UG2 - Upper Gila HSUs, undifferentiated fine to medium grained basin- floor deposits; including those of ancestral Mimbres and Rio Santa Barbara systems; mostly facies 3
- UG2r - Upper Gila HSUs, ancestral Gila River channel and floodplain deposits including local inset and high terrace fills; mostly facies 1 to 3 *NOTE: unit is primarily buried in central basin areas*
- UG2s - Upper Gila HSUs, gypsiferous basin-floor facies; mostly facies 3 and 10

Piedmont facies (mostly in vadose zone)

- UG1 - Medial to distal, Upper Gila HSUs, piedmont slope facies, undivided; mostly facies 5
- UG1c - Upper Gila HSUs, course-grained, proximal to medial piedmont facies, undivided; mostly facies 6

Upper Santa Fe Group hydrostratigraphic units (HSUs)

- USL - Middle Pleistocene to Pliocene, Upper Santa Fe HSUs, sandy, fluvial and eolian sediments (with partially indurated clacic paleosols) of the La Mesa arez; up to three meters thick and entirely in the vadose zone, stippled where up to 3 meters of upper Quaternary eolian cover is present

Basin-floor facies (upper part in vadose zone)

- US2 - Early to Late Miocene, Upper Santa Fe HSUs, basin- floor facies 1 to 4, undivided, includes upper Camp Rice Formation subdivisions, stippled where up to 3 meters of upper Quaternary eolian cover is present
- US2r - Early to Late Miocene, Upper Santa Fe HSUs, fluvial basin-floor facies, includes Camp Rice Formation, stippled where up to 3 meters of upper Quaternary eolian cover is present; mostly facies 1 to 3

Piedmont facies (mostly in vadose zone)

- US1 - Early Pleistocene to Late Miocene, Upper Santa Fe HSUs, medial to distal piedmont facies, mostly facies 5 and 6; includes Camp Rice Formation, stippled where up to 3 meters of upper Quaternary eolian cover is present
- US1c - Early Pleistocene to Late Miocene, Upper Santa Fe HSUs, mostly proximal piedmont facies subunit 6b

- MG - Upper Tertiary, Middle Gila HSUs, undivided (includes MG1 and MG2); primarily facies 7 and 8 (mostly in zone of saturation in central basin areas)
- MG2 - Upper Tertiary, Middle Gila HSUs, basin-floor facies undivided, primarily weakly to moderately indurated pebbley sandstones, sandstones and mudstones of facies 3, 4, and 9 (mostly in the zone of saturation). *Note that unit only occurs in the subsurface beneath the central basin areas*
- MG1 - Upper Tertiary, Middle Gila HSUs, primarily conglomeratic piedmont facies 7 and 8
- LG - Upper Tertiary, Lower Gila HSUs, undivided piedmont and basin-floor facies 4, 7, 8, 9, and 10. *Note that unit is mostly buried in central basin area and is saturated*
- MLG - Middle and Lower Gila undivided HSUs, only on cross-sections
- MSF - Middle to late Miocene, Middle Santa Fe HSUs, including Rincon Valley Formation; mostly facies 8 to 10
- MLS - Upper Tertiary, Middle and Lower Santa Fe undivided HSUs, including Rincon Valley Formation; (playa facies 9 and 10), and Hayner Ranch Formation; fanglomerate facies 7 and 8; mapped only in cross-sections

Bedrock units: pCm through Qmb

- Qbm - Quaternary: Maar deposits, including tuff rims, breccias, basalt flows and cones; and basalt
- Qbc - Quaternary: Basalt cinder cones of West Potrillo Mountains
- Qb - Quaternary: Basalt of West Potrillo Mountains, stippled where up to 3 meters of upper Quaternary eolian cover is present
- QTb - Pliocene-Pleistocene: Basalt flows, dikes and plugs
- Tug - Upper Tertiary: Gila Group, correlatives mapped only in Mexico
- Tub - Upper Tertiary: Basalt flows, undivided with Tug
- Tubc - Upper Tertiary: Basalt cinders
- Tua - Upper Tertiary: Andesite flows and domes
- Tr - Upper Tertiary: Rhyolite flows, domes and pyroclastic deposits with intercalated tuffaceous sandstone beds and breccias, undivided
- Tri - Middle-Upper Tertiary: Rhyolite dikes, plugs and diatremes, and includes some domes
- Tbai - Middle-Upper Tertiary: Basaltic Andesite-intrusive masses
- Tba - Middle-Upper Tertiary: Basaltic-andesite and other intermediate composition flows (including Uvas and Bear Springs Basalts)
- Tvsl - Middle Tertiary: Volcanics of Sleeping Lady Hills- andesite and basaltic andesite flows with tuffaceous sandstone, mudstone and conglomerate, contains ash-flow tuff 6
- Tvth - Middle Tertiary: Volcanics of Tres Hermanas Mountains
- Tvch - Middle Tertiary: Volcanics of Carrizalillo Hills
- Tvcm - Middle Tertiary: Volcanics of Chiricahua Mountains
- Tmi - Middle Tertiary: Intermediate intrusive rocks, including Cookes Peak pluton and scattered andesite porphyry bodies
- Tmsi - Middle Tertiary: Silicic plutonic intrusions
- Tmsp - Middle Tertiary: Sedimentary rocks and tuffs
- Tmrs - Middle Tertiary: Silicic pyroclastic and volcaniclastic rocks, mainly rhyolite and latite ash-flow tuffs and tuffaceous sandstones, with some basaltic-andesite flows (including volcanics of southern Black Range, and Aden and Bordick Hills)
- Tmrv - Middle Tertiary: Silicic to intermediate composition lavas, mainly rhyolite, latite and dacite domes and flows; with some dacite breccias, welds some basalts and andesite flows
- Tmrp - Middle Tertiary: Undifferentiated ash-flow tuffs, chiefly rhyolitic, including Kneeling Nun Tuff and Sugarlump Formation
- Tmcs - Middle Tertiary: sedimentary rocks, mainly volcaniclastic conglomerate and sandstone with some interbedded volcanic rocks of silicic to intermediate composition
- Tma - Middle Tertiary: Prophyritic and nonporphyritic andesite and latite flows
- Tmv - Middle Tertiary: Undivided volcanics of Cerros El Nevado and Cerros El Rincon, Mexico
- Tmr - Middle Tertiary: Undivided silicic volcanics, with some volcaniclastic rocks mostly in Mexico
- Tli - Lower Tertiary: Silicic to intermediate intrusive rocks, mainly dikes, and small plugs
- TVs - Lower Tertiary: Volcaniclastic sedimentary rocks and some andesite flows and breccias, including Palm Park and Rubio Peak Formations
- Tlk - Lower Tertiary: Mostly lower Eocene-Paleocene sedimentary rocks, sandstones, mudstones and conglomerates with minor or no volcaniclastic constituent, including Love Ranch Formation
- TKi - Lower Tertiary and Upper Cretaceous: Intermediate to silicic composition intrusive rocks including granodiorite, quartz monzonite, diorite, monzonite and syenodiorite
- TKv - Lower Tertiary and Upper Cretaceous: Andesite flows and breccias, some volcaniclastic and epiclastic rocks
- TKs - Lower Tertiary and Upper Cretaceous: Undivided Paleocene and Cretaceous clastic sedimentary rocks, (including Lobo and Ringbone formations)
- Kcv - Upper Cretaceous: Undivided sedimentary and volcanic rocks - sandstone and volcaniclastic conglomerate with intercalated andesite flows and silicic welded tuff
- K – Cretaceous: Undivided sedimentary rocks
- Ku - Upper Cretaceous: Undivided sedimentary rocks - sandstone, siltstone and shale with chlocuartzite and minor conglomerate
- Kl - Lower Cretaceous: Undivided sedimentary rocks - shale and siltstone with some interculated sandstone, limestone and conglomerate
- Pz - Paleozoic: Undivided sedimentary rocks
- Pzu - Upper Paleozoic: Undivided Permian and Pennsylvanian sedimentary rocks - mainly limestone and some dolomite, shale, sandstone and quartzite
- Pzm - Middle Paleozoic: Undivided Mississippian and Devonian sedimentary rocks - mainly limestone and some shale
- Pzl - Lower Paleozoic: Undivided Silurian, Ordovician and Cambrian sedimentary rocks - mainly dolomite, limestone, sandstone, and some shale and conglomerate
- pCg - Pre- Cambrian: Primarily granitic intrusive rocks, including granite, diorites, syenites. Granite of Cambrian age may be present in Florida Mountains.
- pCm - Pre- Cambrian: Primarily metamorphic rocks

Plate 1. Surface Geology and Hydrostratigraphic Units of the Southwestern New Mexico Region