New Mexico Geological Society

Downloaded from: https://nmgs.nmt.edu/publications/guidebooks/47



Roadlog References

(Includes references for all roadlogs in this volume.)

in:
Jemez Mountains Region, Goff, F.; Kues, B. S.; Rogers, M. A.; McFadden, L. S.; Gardner, J. N.; [eds.], New Mexico Geological Society 47th Annual Fall Field Conference Guidebook, 484 p. https://doi.org/10.56577/FFC-47

This is a section from the 1996 NMGS Fall Field Conference Guidebook.

Annual NMGS Fall Field Conference Guidebooks

Every fall since 1950, the New Mexico Geological Society (NMGS) has held an annual Fall Field Conference that explores some region of New Mexico (or surrounding states). Always well attended, these conferences provide a guidebook to participants. Besides detailed road logs, the guidebooks contain many well written, edited, and peer-reviewed geoscience papers. These books have set the national standard for geologic guidebooks and are an essential geologic reference for anyone working in or around New Mexico.

Free Downloads

NMGS has decided to make peer-reviewed papers from our Fall Field Conference guidebooks available for free download. This is in keeping with our mission of promoting interest, research, and cooperation regarding geology in New Mexico. However, guidebook sales represent a significant proportion of our operating budget. Therefore, only *research papers* are available for download. *Road logs*, *mini-papers*, and other selected content are available only in print for recent guidebooks.

Copyright Information

Publications of the New Mexico Geological Society, printed and electronic, are protected by the copyright laws of the United States. No material from the NMGS website, or printed and electronic publications, may be reprinted or redistributed without NMGS permission. Contact us for permission to reprint portions of any of our publications.

One printed copy of any materials from the NMGS website or our print and electronic publications may be made for individual use without our permission. Teachers and students may make unlimited copies for educational use. Any other use of these materials requires explicit permission.

This page is intentionally left blank to maintain order of facing pages.

ROAD LOG REFERENCES

Adams, R.D., 1980, Late Paleozoic tectonic and sedimentologic history of the Peñasco uplift, north-central New Mexico [M.S. thesis]: Houston, Rice University, 79 p.

Aldrich, M.J., 1986, Tectonics of the Jemez lineament in the Jemez Mountains and the Rio Grande rift: Journal of Geophysical Research, v. 91(B2), p. 1753-1762.

Allen, C.D., 1989, Changes in the ecology of the Jemez Mountains, New Mexico [Ph.D. thesis]: Berkeley, University of California, 346 p.

Allen, C.D. and Eskew, L., in press, Proceedings of the 1994 symposium on the La Mesa fire: Fort Collins, U.S. Department of Agriculture Forest Service, General Technical Report RM-XXX.

American Public Health Association, 1992, Standard methods for the examination of water and wastewater, 18th Edition: American Waterworks Association, 1006 p.

Anderson, O.J. and Lucas, S.G., 1992, Middle Jurassic Summerville Formation, northern New Mexico: New Mexico Geology, v. 14, p. 79-92.

Anderson, O.J. and Lucas, S.G., 1995, Base of the Morrison Formation, Jurassic of northwestern New Mexico and adjacent areas: New Mexico Geology, v. 17, p. 44-53.

Ankey, L.A., Braile, L.W. and Olsen, K.H., 1986, Upper crustal structure beneath the Jemez Mountains volcanic field, New Mexico, determined by three-dimensional simultaneous inversion of seismic refraction and earthquake data: Journal of Geophysical Research, v. 91(B6), p. 6188-6198.

Armstrong, A.L., 1955, Preliminary observations on the Mississippian System of northern New Mexico: New Mexico Bureau of Mines and Mineral Resources, Circular 39, 42 p.

Armstrong, A.L. and Mamet, B.L., 1974, Biostratigraphy of the Arroyo Penasco Group, Lower Carboniferous (Mississippian), north-central New Mexico: New Mexico Geological Society, Guidebook 25, p. 145-158.

Aubele, J.C., 1979, The Cerros del Rio volcanic field: New Mexico Geological Society, Guidebook 30, p. 243-252.

Baars, D.L. and Stevenson, G.M., 1984, The San Luis uplift, Colorado and New Mexico - an enigma of the Ancestral Rockies: The Mountain Geologist, v. 21, p. 57-67.

Bachman, G.O. and Mehnert, H.H., 1978, New K-Ar dates and the late Pliocene to Holocene geomorphic history of the central Rio Grande region, New Mexico: Geological Society of America Bulletin, v. 89, p. 283-292.

Bailey, R.A., 1989, Geologic map of the Long Valley caldera, Mono-Inyo craters volcanic chain and vicinity, eastern California: U.S. Geological Survey, Miscellaneous Investigations Map I-1933, scale 1:62,500.

Bailey, R.A. and Smith, R.L., 1978, Volcanic geology of the Jemez Mountains, New Mexico: New Mexico Bureau of Mines and Mineral Resources, Circular 163, p. 184-196.

Bailey, R.A., Smith, R.L. and Ross, C.S., 1969, Stratigraphic nomenclature of volcanic rocks in the Jemez Mountains, New Mexico: U.S. Geological Survey, Bulletin 1274-P, 19 p.

Baldridge, S.W. and Olsen, K.H., 1989, The Rio Grande rift: American Scientist, v. 77, p. 240-247.

Baltz, E.H. Jr., 1967, Stratigraphy and regional tectonic implications of part of Upper Cretaceous and Tertiary rocks, east-central San Juan basin, New Mexico: U.S. Geological Survey, Professional Paper 552, 101 p.

Baltz, E.H., Abrahams, J.H. and Purtymun, W.D., 1963, Preliminary report on the geology and hydrology of Mortandad Canyon near Los Alamos, New Mexico, with reference to disposal of liquid low-level radioactive waste: U.S. Geological Survey, Open File Report, Albuquerque, New Mexico.

Becker, N.M., 1991, Influence of hydraulic and geomorphologic components of a semi-arid watershed on depleted uranium transport [Ph.D. thesis]: Madison, University of Wisconsin, 237 p.

Berman, D.S., 1977, A new species of *Dimetrodon* (Reptilia: Pelycosauria) from the Lower Permian of north-central New Mexico, with description of a new species: Journal of Paleontology, v. 51, p. 108-115.

Berman, D.S., 1993, Lower Permian vertebrate localities of New Mexico and their assemblages: New Mexico Museum of Natural History and Science, Bulletin 2, p. 11-21.

Birkland, P.W., 1984, Soils and geomorphology: Oxford University Press, New York, 372 p.

Black, B.A., 1989, Recent oil and gas exploration in the northern part of the Albuquerque basin: Energy frontiers in the Rockies, Albuquerque Geological Society, p. 13.

Black, B.A. and Hiss, W.L., 1974, Structure and stratigraphy in the vicinity of the Shell Oil Company Santa Fe Pacific No. 1 test well, southern Sandoval County, New Mexico: New Mexico Geological Society, Guidebook 25, p. 365-370.

Blake, W.D., Goff, F., Adams, A.I. and Counce, D., 1995, Environmental geochemistry for surface and subsurface waters in the Pajarito Plateau and outlying areas, New Mexico: Los Alamos National Laboratory, Report LA-12912-MS, 43 p.

Bowen, B.M., 1990, Los Alamos climatology: Los Alamos National Laboratory, Report LA-11735-MS, 254 p.

Broxton, D.E., Heiken, G.H., Chipera, S.J. and Byers, F.M., Jr., 1995a, Stratigraphy, petrography and mineralogy of Bandelier Tuff and Cerro Toledo deposits: Los Alamos National Laboratory, Report LA-12934-MS, p. 33-63.

Broxton, D.E., Longmire, P.A., Eller, P.G. and Flores, D., 1995b, Preliminary drilling results for boreholes LADP-3 and LADP-4: Los Alamos National Laboratory, Report LA-12934-MS, p. 93-109.

Broxton, D.E. and Reneau, S.L., 1995, Stratigraphic nomenclature of the Bandelier Tuff for the Environmental Restoration Project at Los Alamos National Laboratory: Los Alamos National Laboratory, Report LA-13010-MS, 21 p.

Broxton, D.E. and Reneau, S.L., 1996, Buried early Pleistocene landscapes beneath the Pajarito Plateau, Northern New Mexico: New Mexico Geological Society, Guidebook 47.

Bryan, K. and McCann, F.T., 1936, Successive pediments and terraces of the upper Rio Puerco in New Mexico: Journal of Geology, v. 44, p. 145-172.

Bryan, K. and McCann, F.T., 1937, The Ceja del Rio Puerco, a border feature of the Basin and Range province in New Mexico: Journal of Geology, v. 45, p. 801-828.

Bryan, K. and McCann, F.T., 1938, The Ceja del Rio Puerco: a border feature of the Basin and Range province in New Mexico: Journal of Geology, v. 46, p. 1-16.

Budding, A.J., 1978, Gravity survey of the Pajarito Plateau, Los Alamos and Santa Fe counties, New Mexico: Los Alamos Scientific Laboratory Report, LA-7419-MS, 15 p.

Bull, W.B., 1991, Geomorphic response to climate change: Oxford University Press, New York, 356 p.

Cather, S.M., 1996, Geological map of upper Cenozoic deposits of the San Antonio 7.5' quadrangle, New Mexico: New Mexico Bureau of Mines and Mineral Resources, Open-file Report 417c.

Cather, S.M. and McIntosh, W.C., 1990, Volcanogenic flood deposits near San Antonio, New Mexico -- depositional processes and implications: Sediments 1990, 13th International Sedimentological Congress, Nottingham, England, 80 p.

Chafetz, H.S., Utech, N.M. and Fitzmaurice, S.P., 1991, Differences in d180 and d13C signatures of seasonal laminae comprising travertine stromatolites: Journal of Sedimentary Petrology, v. 61, p. 1015-1028.

Chamberlin, R.M. and Eggleston, T.L., 1996, Geological map of the Luis Lopez 7.5' quadrangle, Socorro county, New Mexico: New Mexico Bureau of Mines and Mineral Resources, Open-file Report 421.

Charles, R.W., Vidale-Buden, R. and Goff, F., 1986, An interpretation of the alteration assemblages at Sulphur Springs, Valles caldera, New Mexico: Journal of Geophysical Research, v. 91(B2), p. 1887-1898.

Chilton, L., Chilton, K., Arango, P., Dudley, J., Neary, N. and Stelzner, P., 1984, New Mexico, a new guide to the colorful state: Albuquerque, University of New Mexico Press, 640 p.

Clark, J.D., 1929, The saline springs of the Rio Salado, Sandoval County, New Mexico, University of New Mexico Bulletin, Chemistry Series, v. 1, no. 3, 29 p.

Cobban, W.A. and Hook, S.C., 1980, The Upper Cretaceous (Turonian) ammonite family Coilopoceratidae Hyatt in the Western Interior of the United States: U.S. Geological Survey, Professional Paper 1192, 28 p.

Cobban, W.A. and Hook, S.C., 1989, Mid-Cretaceous molluscan record from west-central New Mexico: New Mexico Geological Society, Guidebook 40, p. 247-264.

Conover, C.S., Theis, C.V. and Griggs, R.L., 1963, Geology and hydrology of Valle Grande and Valle Toledo, Sandoval County, New Mexico: U.S. Geological Survey, Water Supply Paper 1619-Y, 37 p.

Cordell, L., 1962, Pennsylvanian paleotectonics in central northwestern New Mexico [M.S. thesis]: Albuquerque, University of New Mexico, 62 p.

Cordell, L., 1978, Regional geophysical setting of the Rio Grande rift: Geological Society of America Bulletin, v. 89, p. 1073-1090.

Corrao, D.E. and Kues, B.S., 1996, Late Pennsylvanian marine faunas of the Madera Formation, Jemez Springs area, north-central New Mexico: Proceedings Volume, New Mexico Geological Society Annual Spring Meeting, p. 54.

Crabaugh, J.P., 1988, Depositional history of the Lower Permian Abo Formation and lower Meseta Blanca Member of the Yeso Formation, north central New Mexico [Ph.D. dissertation]: Arlington, University of Texas, 214 p.

Craigg, S.D., 1984, Hydrologic data on the Pueblos of Jemez, Zia and Santa Ana, Sandoval County, New Mexico: U.S. Geological Survey, Open-file Report 84-460, 37 p.

Craigg, S.D., 1992, Water resources on the Pueblos of Jemez, Zia and Santa Ana, Sandoval County, New Mexico: U.S. Geological Survey, Water-Resources Investigations Report 89-4091, 122 p.

Dalrymple, G.B., Cox, A., Doell, R.R. and Gromme, C.S., 1967, Pliocene geomagnetic polarity epochs: Earth and Planetary Sciences Letters, v. 2, p. 163-173.

Davenport, D.W., 1993, Micromorphology, mineralogy and genesis of soils and fracture fills on the Pajarito Plateau, New Mexico [Ph.D. Dissertation]: Lubbock, Texas Tech University.

DePaolo, D.J., Perry, F.V. and Baldridge, W.S., 1992, Crustal versus mantle sources of granitic magmas: a two-parameter model based on Nd isotopic studies: Transactions of the Royal Society of Edinburgh: Earth Sciences, v. 83, p. 439-446.

Dethier, D.P., in press, Geologic map of the White Rock quadrangle: New Mexico Bureau of Mines and Mineral Resources.

Dethier, D.P., Halverson, N., Marrack, L., Meagher, M. and Oelkers, E., 1990, Occurrence of the Lava Creek B tephra layer in the northwestern Española Basin, New Mexico: New Mexico Geology, v. 12, p. 77-82.

Doell, R.R., Dalyrymple, G.B., Smith, R.L. and Bailey, R.A., 1968, Paleomagnetism, potassium-argon ages and geology of rhyolites and associated rocks of the Valles caldera, New Mexico: Geological Society of America, Memoir 116, p. 211-248.

Dondanville, R.F., 1971, The hydrothermal geology of the Valles caldera, Jemez Mountains, New Mexico: Union Oil Company, Santa Rosa, California, Open-file Consultant Report, 36 p.

Dransfield, B.J. and Gardner, J.N., 1985, Subsurface geology of the Pajarito Plateau, Española, Basin, New Mexico: Los Alamos National Laboratory, Report LA-10455-MS, 15 p.

DuChene, H.R., 1973, Structure and stratigraphy of Guadalupe Box and vicinity, Sandoval County, New Mexico [M.S. thesis]: Albuquerque, University of New Mexico, 100 p.

DuChene, H.R., 1974, Pennsylvanian rocks of north-central New Mexico: New Mexico Geological Society, Guidebook 25, p. 159-162.

DuChene, H.R., Engelhardt, D.W. and Woodward, L.A., 1981, Palynological evidence for the age of the Abiquiu Formation, north-central New Mexico: Geological Society of America Bulletin, v. 92, pt. 1, p. 993-998.

DuChene, H.R., Kues, B.S. and Woodward, L.A., 1977, Osha Canyon Formation (Pennsylvanian), new Morrowan unit in north-central New Mexico: American Association of Petroleum Geologists Bulletin, v. 61, p. 1513-1522.

Dunbar, N.W. and Hervig, R.L., 1992, Volatile and trace element composition of melt inclusions from the Lower Bandelier Tuff: implications for eruptive style and magma chamber processes: Journal of Geophysical Research, v. 97, p. 15,151-15,170.

Eberth, D.A., 1987, Stratigraphy, sedimentology and palaeoecology of Cutler Formation redbeds (Permo-Pennsylvanian) in north-central New Mexico [Ph.D. dissertation]: Toronto, University of Toronto, 264 p.

Eberth, D.A. and Berman, D.S., 1993, Stratigraphy, sedimentology and vertebrate paleoecology of the Cutler Formation redbeds (Pennsylvanian-Permian) of north-central New Mexico: New Mexico Museum of Natural History and Science, Bulletin 2, p. 33-48.

Eberth, D.A. and Miall, A.D., 1991, Stratigraphy, sedimentology and evolution of a vertebrate-bearing braided to anastomosed fluvial system, Cutler Formation (Permian-Pennsylvanian), north-central New Mexico: Sedimentary Geology, v. 72, p. 225-252.

Elston, W.E., 1967, Summary of the mineral resources of Bernalillo, Sandoval and Santa Fe Counties, New Mexico: New Mexico Bureau of Mines and Mineral Resources, Bulletin 81, 81 p.

Fahlquist, L. and Janik, C.J., 1992, Procedures for collecting and analyzing gas samples from geothermal systems: U.S. Geological Survey, Open-file Report 92-211, 19 p.

Ferguson, J.F., Baldridge, W.S., Braile, L.W., Biehler, S., Gilpin, B. and Jiracek, G.R., 1995, Structure of the Española Basin, Rio Grande rift, New Mexico, from SAGE seismic and gravity data: New Mexico Geological Society, Guidebook 46, p. 105-110.

Flesch, G.A., 1974, Stratigraphy and sedimentology of the Morrison Formation (Jurassic), Ojito Spring Quadrangle, Sandoval County New Mexico: a preliminary discussion: New Mexico Geological Society, Guidebook 25, p. 185-195.

Formento-Trigilio, M.L. and Pazzaglia, F.J., 1996, Quaternary stratigraphy, tectonic geomorphology and long-term landscape evolution of the southern Sierra Nacimiento: New Mexico Geological Society, Guidebook 47.

Foxx, T.S., compiler, 1984, La Mesa Fire Symposium, Los Alamos, New Mexico, October 6 and 7, 1981: Los Alamos National Laboratory, Report LA-9236-NERP, 172 p.

Fracasso, M.A., 1980, Age of the Permo-Carboniferous Cutler Formation vertebrate fauna of El Cobre Canyon, New Mexico: Journal of Paleontology, v. 54, p. 1237-1244.

Gallaher, B., 1995, Groundwater velocities in Los Alamos Canyon: Los Alamos National Laboratory Memorandum ESH-18/WQ&H-95-409 to ESH-18 Reading File from Bruce Gallaher (ESH-18), Los Alamos, New Mexico.

Galusha, T., 1966, The Zia Sand Formation, new early to medial Miocene beds in New Mexico: American Museum Novitates, no. 2271, 12 p.

Galusha, T. and Blick, J.C., 1971, Stratigraphy of the Santa Fe Group, New Mexico: American Museum of Natural History, Bulletin 144, 127 p.

Gardner, J.N., Goff, F., Garcia, S. and Hagan, R.C., 1986, Stratigraphic relations and lithologic variations in the Jemez volcanic field, New Mexico: Journal of Geophysical Research, v. 91, p. 1763-1778.

Gardner, J.N. and House, L., 1987, Seismic hazards investigations at Los Alamos National Laboratory, 1984 to 1985: Los Alamos National Laboratory, Report LA-11072-MS, 76 p.

Gawne, C.E., 1975, Rodents from the Zia Sand Miocene of New Mexico: American Museum Novitates, no. 2586, 25 p.

Gawne, C.E., 1976, Lagomorphs from the Zia Sand Miocene of New Mexico: American Museum Novitates, no. 2608, 15 p.

Gawne, C.E., 1981, Sedimentology and stratigraphy of the Miocene Zia Sand in New Mexico: summary: Geological Society of America Bulletin, v. 92, Pt. I, p. 999-1007.

Gay, K.R., 1995, Contrasting rhyolitic eruptive products produced by two simultaneous late-Miocene eruptions in the southeastern Jemez Mountains, New Mexico [M.S. thesis]: Albuquerque, University of New Mexico, 169 p.

Geissman, J.W., 1988, Paleomagnetism and rock magnetism of Quaternary volcanic rocks and late Paleozoic strata, VC-1 corehole, Valles caldera, New Mexico: Journal of Geophysical Research, v. 93(B6), p. 6001-6026.

Geissman, J.W., Brown, L., Turrin, B., McFadden, L.D. and Harlan, S.S., 1990, Brunhes age geomagnetic excursion recorded in latest Quaternary time, Albuquerque volcanoes, New Mexico, USA: Geophysical Journal International, v. 120, p. 73-88.

Gile, L.H. and Hawley, J.W., 1966, Periodic sedimentation and soil formation on an alluvial-fan piedmont in southern New Mexico: Soil Science Society of America Proceedings, v. 30, p. 261-268.

Gillette, D.D., 1991, *Seismosaurus halli,* gen. et sp. nov., a new sauropod dinosaur from the Morrison Formation (Upper Jurassic/Lower Cretaceous) of New Mexico: Journal of Vertebrate Paleontology, v. 11, p. 417-433.

Goff, F., 1995, Geologic map of Technical Area 21: Los Alamos National Laboratory, Report LA-2934-MS, p. 7-18.

Goff, F., Evans, W.C., Gardner, J.N., Adams, A., Janik, C.J., Kennedy, B.M., Trujillo, P.E. and Counce, D., 1994, Interpretation of in-situ fluid samples from geothermal wells: example from hole VC-2B, Valles Caldera, New Mexico: Geothermal Science and Technology, v. 4, p. 97-128.

Goff, F. and Gardner, J.N., 1980, Geologic map of the Sulphur Springs area, Valles caldera geothermal system, New Mexico: Los Alamos Scientific Laboratory, Map LA-8634-MAP, 2 sheets, 1:5000.

Goff, F. and Gardner, J.N., 1987, Jemez volcanics cored in second D.O.E. hole: Geotimes, v. 32, p. 11-12.

Goff, F. and Gardner, J.N., 1994, Evolution of a mineralized geothermal system, Valles Caldera, New Mexico: Economic Geology, v. 89, p. 1803-1832.

Goff, F., Gardner, J., Baldridge, W.S., Hulen, J., Neilson, D., Vaniman, D., Heiken, G., Dungan, M. and Broxton, D., 1989, Excursion 17B: volcanic and hydrothermal evolution of Valles caldera and Jemez volcanic field: New Mexico Bureau of Mines and Mineral Resources, Memoir 46, p. 381-434.

Goff, F., Gardner, J.N., Hulen, J.B., Nielson, D.L., Charles, R., WoldeGabriel, G., Vuataz, F., Musgrave, J.A., Shevenell, L. and Kennedy, B.M., 1992, The Valles caldera hydrothermal system, past and present, New Mexico, USA: Scientific Drilling, v. 3, p. 181-204.

Goff, F., Gardner, J.N., Vidale, R. and Charles, R., 1985, Geochemistry and isotopes of fluids from Sulphur Springs, Valles caldera, New Mexico: Journal of Volcanology and Geothermal Research, v. 23, p. 273-297.

Goff, F. and Grigsby, C.O., 1982, Valles caldera geothermal systems, New Mexico, USA: Journal of Hydrology, v. 56, p. 119-136.

Goff, F., Grigsby, C.O., Trujillo, P.E., Counce, D. and Kron, A., 1981, Geology, water geochemistry and geothermal potential of the Jemez Springs area, Cañon de San Diego, New Mexico: Journal of Volcanology and Geothermal Research, v. 10, p. 227-244.

Goff, F., Heiken, G., Tamanyu, S., Gardner, J., Self, S., Drake, R. and Shafiqullah, M., 1984, Location of Toledo caldera and formation of the Toledo embayment, Jemez Mountains, New Mexico: EOS, Transactions, American Geophysical Union, v. 65, p. 1145.

Goff, F. and Kron, A., 1980, In-progress geologic map of Cañon de San Diego, Jemez Springs, New Mexico and lithologic log of Jemez Springs geothermal well: Los Alamos National Laboratory, Map LA-8276-MAP.

Goff, F., Nielson, D.L., Gardner, J.N., Hulen, J.B., Lysne, P., Shevenell, L. and Rowley, J.C., 1987, Scientific drilling at Sulphur Springs, Valles caldera, New Mexico: Core Hole VC-2A: EOS, v. 68, p. 649, 661-662.

Goff, F., Rowley, J.C., Gardner, J.N., Hawkins, W., Goff, S., Charles, R., Wachs, D., Maassen, L. and Heiken, G., 1986, Initial results from VC-1: first Continental Scientific Drilling Program core hole in the Valles caldera, New Mexico: Journal of Geophysical Research, v. 91(B2), p. 1742-1752.

Goff, F. and Shevenell, L., 1987, Travertine deposits of Soda Dam, New Mexico and their implications for the age and evolution of the Valles caldera hydrothermal system: Geological Society of America Bulletin, v. 99, p. 292-302.

Goff, F., Shevenell, L., Gardner, J.N., Vuataz, F.D. and Grigsby, C.O., 1988, The hydrothermal outflow plume of Valles caldera, New Mexico and a comparison with other outflow plumes: Journal of Geophysical Research, v. 93(B6), p. 6041-6058.

Goldstein, N.E. and Tsang, C.F., 1984, A review of lessons learned from the DOE/Union Baca geothermal project: Geothermal Resources Council Bulletin, v. 8, p. 7-12.

Golombek, M.P., 1983, Geology, structure and tectonics of the Pajarito fault zone in the Española basin of the Rio Grande rift, New Mexico: Geological Society of America Bulletin, v. 94, p. 192-205.

Gosz, J.R., Moore, D.I., Shore, G.A., Grover, H.G., Rison, W. and Rison, C., 1995, Lightning estimates of precipitation location and quantity on the Sevilleta LTER, New Mexico: Ecological Applications, v. 5, p. 1141-1150.

Griggs, R.L., 1964, Geology and ground-water resources of the Los Alamos area, New Mexico: United States Geological Survey, Water-Supply Paper 1753, 107 p.

Hawley, J.W., Love, D.W. and Wells, S.G., 1982, Road-log segment II-A: Albuquerque to Correo via El Cerro de Los Lunas and Rio Puerco: New Mexico Geological Society, Guidebook 33, p. 38-49.

Hay, R.L., 1978, Geologic occurrences of zeolites; *in* Sand, L.B. and Mumpton, F.A., eds., Natural zeolites: occurrences, properties, use: Elmsford, New York, Pergamon Press, p. 135-143.

Heckel, P.H., 1986, Sea-level curve for Pennsylvanian eustatic marine transgressive-regressive depositional cycles along midcontinent outcrop belt, North America: Geology, v. 14, p. 330-334.

Heiken, G., Goff, F., Stix, J., Tamanyu, S., Shafiqullah, M., Garcia, S. and Hagan, R., 1986, Intracaldera volcanic activity, Toledo caldera and embayment, Jemez Mountains, New Mexico: Journal of Geophysical Research, v. 91(B2), p. 1799-1815.

Heiken, G. and Wohletz, K.H., 1984, Volcanic ash: University of California Press, Berkeley.

Heiken, G., Wohletz, K., Fisher, R.V. and Dethier, D.P., in press, Maar volcanoes of White Rock Canyon--Interaction of ground and surface water with basaltic volcanoes of the Rio Grande rift, New Mexico: New Mexico Bureau of Mines and Mineral Resources, Bulletin 134.

Henbest, L.G. and Read, C.B., 1944, Stratigraphic distribution of the Pennsylvanian Fusulinidae in a part of the Sierra Nacimiento of Sandoval and Rio Arriba Counties, New Mexico: U.S. Geological Survey, Oil and Gas Investigations Preliminary Chart 2.

Henley, R.W., Truesdell, A.H. and Barton, P.B., 1984, Fluid-mineral equilibria in hydrothermal systems: Reviews in Economic Geology, v. 1, El Paso, Texas, Society of Economic Geology, 267 p.

Herrick, C.L., 1896, The so-called Socorro tripoli: American Geologist, v. 18, p. 135-140.

Hoard, D., 1981, Los Alamos outdoors: The Los Alamos Historical Society, Los Alamos, New Mexico, 120 p.

Hulen, J.B. and Gardner, J.N., 1989, Field geologic log for Continental Scientific Drilling Program corehole VC-2B, Valles Caldera, New Mexico: Earth Science Laboratory, University of Utah Research Institute, Report ESL-89025-TR, 92 p.

Hulen, J.B. and Nielson, D.L., 1986a, Hydrothermal alteration in the Baca geothermal system, Valles caldera, New Mexico: Journal of Geophysical Research, v. 91(B2), p. 1867-1886.

Hulen, J.B. and Nielson, D.L., 1986b, Stratigraphy and hydrothermal alteration in well Baca-8, Sulphur Springs area, Valles caldera, New Mexico: Geothermal Resources Council Transactions, v. 10, p. 187-192.

Hulen, J.B. and Nielson, D.L., 1988, Hydrothermal brecciation in the Jemez fault zone, Valles caldera, New Mexico: Journal of Geophysical Research, v. 93(B6), p. 6077-6090.

Hulen, J.B., Nielson, D.L., Goff, F., Gardner, J.N. and Charles, R., 1987, Molybdenum mineralization in an active geothermal system, Valles caldera, New Mexico: Geology, v. 15, p. 748-752.

Hulen, J.B., Nielson, D.L. and Little, T.M., 1991, Evolution of the western Valles caldera complex, New Mexico: evidence from intracaldera sandstones, breccias and surge deposits: Journal of Geophysical Research, v. 96(B5), p. 8127-8142.

Hunt, A.P. and Lucas, S.G., 1992, The paleoflora of the lower Cutler Formation (Pennsylvanian, Desmoinesian?) in El Cobre Canyon, New Mexico and its biochronological significance: New Mexico Geological Society, Guidebook 43, p. 145-150.

Hunt, A.P. and Lucas, S.G., 1993, Jurassic vertebrates of New Mexico: New Mexico Museum of Natural History and Science, Bulletin 2, p. 71-75.

Iddings, J.P., 1890, On a group of rocks from the Tewan Mountains, New Mexico and on the occurrence of primary quartz in certain basalts: U.S. Geological Survey, Bulletin 66, 34 p.

Irion, G. and Müller, G., 1968, Mineralogy, petrology and chemical composition of some calcareous tufa from the Schwabische Alb, Germany; *in* Müller G. and Friedman, G.M., eds., Recent developments in carbonate sedimentology in central Europe: Springer-Verlag, New York, p. 157-171.

IT Corporation, 1987, Hydrogeologic assessment of Technical Area 54, Areas G and L, Los Alamos National Laboratory: IT Corporation Report No. NMHWA 001007.

Izett, G.A. and Obradovich, J.D., 1994, $^{40}Ar/^{39}Ar$ age constraints for the Jaramillo normal subchron and the Matayama-Brunhes geomagnetic boundary: Journal of Geophysical Research, v. 99(B2), p. 2925-2934.

Izett, G., Obradovich, J., Naeser, C. and Cebula, G., 1981, Potassium-argon and fission-track zircon ages of Cerro Toledo rhyolite tephra units in the Jemez Mountains, New Mexico: U.S. Geological Survey, Professional Paper 1199-D, p. 37-43.

Janik, C.J., Truesdell, A.H., Goff, F., Shevenell, L., Stallard, M.L., Trujillo, P.E. and Counce, D., 1991, A geochemical model of the Platanares geothermal system, Honduras: Journal of Volcanology and Geothermal Research, v. 45, p. 125-146.

Johnson, G.D., 1979, Early Permian vertebrates from Texas: Actinopterygii *(Schaeffericthys),* Chondrichthyes (including North American Pennsylvanian and Triassic Xenacanthodii) and Acanthodii [Ph.D. dissertation]: Dallas, Southern Methodist University, 653 p.

Johnson, G.D., 1981, Hybodontoidei (Chondrichthyes) from Wichita-Albany Group (Early Permian) of Texas: Journal of Vertebrate Paleontology, v. 1 p. 1-41.

Johnson, G.D., 1992, Chondrichthyan biostratigraphy of the North American Permian System: Occasional Publications, Earth Sciences and Resources Institute, University of South Carolina, v. 8A, p. 41-50.

Karlstrom, K.E. and Daniel, C.G., 1993, Restoration of Laramide right-lateral strike slip in northern New Mexico by using Proterozoic piercing points: tectonic implications from the Proterozoic to the Cenozoic: Geology, v. 21, p. 1139-1142.

Kearl, P.M., Dexter, J.J. and Kautsky, M., 1986, Vadose zone characterization of Technical Area 54, Waste Disposal Areas G and L, Los Alamos National Laboratory, New Mexico: Report 4: Preliminary assessment of the hydrologic system through Fiscal Year 1986: UNC Technical Services, Inc., Grand Junction, Colorado Report No. GJ-54.

Keenan, J.H., Keyes, F.G., Hill, P.G. and Moore, J.G., 1969, Steam tables - Thermodynamic properties of water, including liquid, vapor and solid phases: New York, Wiley, 162 p.

Kelley, V.C., 1950, Regional structure of the San Juan Basin: New Mexico Geological Society, Guidebook 1, p. 101-108.

Kelley, V.C., 1952, Tectonics of the Rio Grande depression of central New Mexico: New Mexico Geological Society, Guidebook 3, p. 93-105.

Kelley, V.C., 1977, Geology of Albuquerque basin, New Mexico: New Mexico Bureau of Mines and Mineral Resources, Memoir 33, 59 p.

Kelley, V.C., 1978, Geology of the Española Basin, New Mexico Bureau of Mines and Mineral Resources, Geologic Map 48, scale 1:250,000.

Kelley, V.C., Baltz, E.H., Jr. and Bailey, R.A., 1961, Road log: Jemez Mountains and vicinity: New Mexico Geological Society, Guidebook 12, p. 47-62.

Kelley, V.C. and Kudo, A.M., 1978, Volcanoes and related basalts of Albuquerque basin, New Mexico: New Mexico Bureau of Mines and Mineral Resources, Circular 156, 30 p.

Kelson, K.I., Hemphill-Haley, M.A., Olig, S.S., Simpson, G.D., Gardner, J.N., Reneau, S.L., Kolbe, T.R., Forman, S.L. and Wong, I.G., Late Pleistocene and possibly Holocene displacement along the Rendija Canyon fault, Los Alamos County, New Mexico: New Mexico Geological Society, Guidebook 47.

Kerr, R., 1982, Extracting geothermal energy can be hard: Science, v. 218, p. 668-669.

Kudo, A.M., Kelley, V.C., Damon, P.E. and Shafiqullah, M., 1977, K-Ar ages of basalt flows at Canjilon Hill, Isleta volcano and Cat Hills volcanic field, Albuquerque-Belen basin, central New Mexico: Isochron/West, no. 18, p. 15-16.

Kuentz, D.A., 1986, The Otowi member of the Bandelier Tuff: a study of the petrology, petrography and geochemistry of an explosive silicic eruption, Jemez Mountains, New Mexico [M.S. thesis]: Arlington, University of Texas, 168 p.

Kues, B.S., 1992, James Hervey Simpson and the first record of San Juan basin geology: New Mexico Geological Society, Guidebook 43, p. 83-101.

Kues, B.S., 1996, Guide to the Late Pennsylvanian paleontology of the upper Madera Formation, Jemez Springs area, north-central New Mexico: New Mexico Geological Society, Guidebook 47.

Langston, W. Jr., 1952, The first embolomerous amphibians from New Mexico: Journal of Geology, v. 61, p. 68-71.

Langston, W. Jr., 1953, Permian amphibians from New Mexico: University of California, Publications in the Geological Sciences, v. 29, p. 349-416.

LANL (Los Alamos National Laboratory), 1993, RCRA Field Investigation Work Plan for Operable Unit 1098 (TA-2 and TA-41): Los Alamos National Laboratory, Report LA-UR-92-3825, 110 p.

Lindgren, W., Graton, L.C. and Gordon, C.H., 1910, The ore deposits of New Mexico, U.S. Geological Survey, Professional Paper 68, 361 p.

Lipman, P.W., 1976, Caldera-collapse breccias in the western San Juan Mountains, Colorado: Geological Society of America Bulletin, v. 7, p. 1397-1410.

Lipman, P.W., Sawyer, D.A. and Hon, K., 1989, The central San Juan caldera cluster: New Mexico Bureau of Mines and Mineral Resources, Memoir 46, p. 330-350.

Loaiza, D. and Vold, E., 1995, Moisture profile measurements in subsurface monitor holes at the Los Alamos LLRW Disposal Site: Los Alamos National Laboratory, Report No. LA-UR-95-1922.

Longmire, P., Reneau, S., Watt, P., McFadden, L., Gardner, J., Duffy, C. and Ryti, R., in press, Natural background geochemistry, geomorphology and pedogenesis of selected soil profiles and Bandelier Tuff, Los Alamos, New Mexico, 1995: Los Alamos National Laboratory, Report LA-12913-MS, 26 p.

Lovejoy, B.P., 1958, Paleontology and stratigraphy of the Jemez Springs area, Sandoval County, New Mexico [M.S. thesis], Albuquerque, University of New Mexico, 101 p.

Lucas, S.G., 1982, Vertebrate paleontology, stratigraphy and biostratigraphy of Eocene Galisteo Formation, north-central New Mexico: New Mexico Bureau of Mines and Mineral Resources, Circular 186, 34 p.

Lucas, S.G. Anderson, O.J. and Pigman, C., 1995, Jurassic stratigraphy in the Hagan Basin, north-central New Mexico: New Mexico Geological Society, Guidebook 46, p. 247-255.

Lucas, S.G. and Hayden, S.N., 1991, Type section of the Permian Bernal Formation and the Permian-Triassic boundary in north-central New Mexico: New Mexico Geology, v. 13, p. 9-15.

Lucas, S.G. and Hunt, A.P., 1985, Dinosaurs from the Upper Jurassic Morrison Formation in New Mexico: New Mexico Journal of Science, v. 25, p. 1-12.

Lucas, S.G. and Hunt, A.P., 1992, Triassic stratigraphy and paleontology, Chama basin and adjacent areas, north-central New Mexico: New Mexico Geological Society, Guidebook 43, p. 151-172.

Lucas, S.G. and Ingersoll, R.V., 1981, Cenozoic continental deposits of New Mexico; an overview: Geological Society of America Bulletin, v. 92, pt. 1, p. 917-932.

Lund, R., 1968, Fossil fishes from southwestern Pennsylvanian, Part 1, Fishes from the Duquesne Limestone (Conemaugh, Pennsylvanian): Annals of the Carnegie Museum, v. 8, p. 231-261.

Machette, M.N., 1985, Calcic soils of the southwestern United States; *in* Weide, D.L. and Faber, M.L., eds., Soils and Quaternary geology of the southwestern United States: Geological Society of America, Special Paper 203, p. 1-22.

Mack, G.H. and James, W.C., 1986, Cyclic sedimentation in the mixed siliciclastic-carbonate Abo-Hueco transitional zone (Lower Permian), southwestern New Mexico: Journal of Sedimentary Petrology, v. 56, p. 635-647.

Manley, C.R. and Fink, J.H., 1987, Internal textures of rhyolite flows as revealed by research drilling: Geology, v. 15, p. 549-552.

Marsh, O.C., 1878, Notice of new fossil reptiles: American Journal of Science, v. 15, p. 409-411.

McGrath, D.B. and Hawley, J.W., 1987, Geomorphic evolution and soil-geomorphic relationships in the Socorro area, central New Mexico; *in* Guidebook to the Socorro area: New Mexico Bureau of Mines and Mineral Resources, p. 55-67.

McIntosh, W.C. and Harlan, S., 1991, Preliminary $^{40}Ar/^{39}Ar$ age determinations and paleomagnetic results from the Peralta Tuff Member, Bearhead Rhyolite, Tent Rocks, New Mexico: New Mexico Bureau of Mines and Mineral Resources, Bulletin 137, p. 101-103.

McIntosh, W.C. and Quade, J., 1995, $^{40}Ar/^{39}Ar$ geochronology of tephra layers in the Santa Fe Group, Española basin, New Mexico: New Mexico Geological Society, Guidebook 46, p. 279-287.

Meyers, G.A., Wells, S.G. and Jull, A.J.T., 1995, Fire and alluvial chronology in Yellowstone National Park: climatic and intrinsic controls on Holocene geomorphic processes: Geological Society of America Bulletin, v. 107, p. 1211-1230.

Myrick, D.F., 1970, New Mexico's railroads--an historical survey: Golden, Colorado Railroad Museum, 205 p.

Newberry, J.S., 1897, New species and a new genus of American Paleozoic fishes, together with notes on the genera *Oracanthus, Dactylodus, Polyrhizodus, Sandalodus, Deltodus:* Transactions of the New York Academy of Science, v. 16, p. 282-304.

New Mexican (Santa Fe New Mexican), December 19, 1897, The Albemarle Group; February 4, 1901, Some Census Statistics; February 11, 1902, A Blow to Bland; June 3, 1904, Madrid Notes.

Nielsen, E., 1933, Permo-Carboniferous fishes from East Greenland: Meddeleser om Gronland, v. 86, no. 3 p. 1-63.

Nielson, D.L., 1986, Summary of subsurface data from the Sulphur Springs area, Valles caldera, New Mexico: University of Utah Research Institute, Earth Science Laboratory Unpublished Report, 21 p.

Nielson, D.L. and Hulen, J.B., 1984, Internal geology and evolution of the Redondo dome, Valles caldera, New Mexico: Journal of Geophysical Research, v. 89, p. 8695-8711.

Northrop, S.A. and Wood, G.H., Jr., 1945, Large *Schizophoria* in basal Pennsylvanian of New Mexico: Geological Society of America Bulletin, v. 56, p. 1185.

Northrop, S.A. and Wood, G.H., Jr., 1946, Geology of the Nacimiento Mountains, San Pedro Mountain and adjacent plateaus in parts of Sandoval and Rio Arriba Counties, New Mexico: U.S. Geological Survey, Oil and Gas Investigations Preliminary Map 57.

Nyhan, J.W., Hacker, L.W., Calhoun, T.E. and Young, D.L., 1978, Soil survey of Los Alamos County, New Mexico: Los Alamos Scientific Laboratory, Report LA-6779-MS, 21 p.

Ogg, J.G., 1995, Magnetic polarity time scale of the Phanerozoic: *in* Ahrens, T.J. ed., Global earth physics, a handbook of physical constants: American Geophysical Union Reference Shelf 1, p. 240-270.

Olig, S.S., Kelson, K.I., Gardner, J.N. Reneau, S.L. and Hemphill-Haley, M., 1996, The earthquake potential of the Pajarito fault system: New Mexico Geological Society, Guidebook 47.

Olsen, K.H., Braile, L.W., Stewart, J.N., Daudt, J.R., Keller, G.R., Ankeny, L.A. and Wolff, J.J., 1986, Jemez Mountains volcanic field, New Mexico: time term interpretation of the CARDEX seismic experiment and comparison with Bouguer gravity: Journal of Geophysical Research, v. 91(B6), p. 6175-6187.

Ossian, C.R., 1974, Paleontology, paleobotany and facies characteristics of a Pennsylvanian delta in southeastern Nebraska [Ph.D. dissertation]: Austin, University of Texas, 393 p.

Pearce, T.M., 1965, New Mexico place names: Albuquerque, University of New Mexico Press, 187 p.

Perkins, B. and DePoorter, G.L., 1985, Plants and their relationship to soil moisture and tracer movement: Los Alamos National Laboratory, Report No. LA-10216-MS.

Perry, F.V., DePaolo, D.J. and Baldridge, W.S., 1993, Neodymium isotopic evidence for decreasing crustal contributions to Cenozoic ignimbrites of the western United States: implications for the thermal evolution of the Cordilleran crust: Geological Society of America Bulletin, v. 105, p. 872-882.

Purtymun, W.D., 1995, Geologic and hydrologic records of observation wells, test holes, test wells, supply wells, springs and surface water stations in the Los Alamos area; Los Alamos National Laboratory, Report LA-12883-MS, 339 p.

Purtymun, W.D. and Kennedy, W.R., 1971, Geology and hydrology of Mesita del Buey: Los Alamos Scientific Laboratory, Report LA-4660, 12 p.

Purtymun, W.D., Peters, R.J. and Owens, J.W., 1980, Geohydrology of White Rock Canyon of the Rio Grande from Otowi to Frijoles Canyon: Los Alamos Scientific Laboratory, Report LA-8635-MS, 15 p.

Rao, U., Fehn, U., Teng, R.T.D. and Goff, F., 1996, Sources of chloride in hydrothermal fluids from the Valles caldera, New Mexico: ^{36}Cl study: Journal of Volcanology and Geothermal Research, in press.

Read, C.B. and Wood, G.H., Jr., 1947, Distribution and correlation of Pennsylvanian rocks in Late Paleozoic sedimentary basins of northern New Mexico: Journal of Geology, v. 55, p. 220-235.

Reneau, S.L. and Dethier, D.P., 1996, Pliocene and Quaternary history of the Rio Grande, White Rock Canyon and vicinity, New Mexico: New Mexico Geological Society, Guidebook 47.

Reneau, S.L., Dethier, D.P. and Carney, J.S., 1995, Landslides and other mass movements near Technical Area 33, Los Alamos National Laboratory: Los Alamos National Laboratory, Report LA-12955-MS, 48 p.

Reneau, S.L., Gardner, J.N. and Forman, S.L., 1996, New evidence for the age of the youngest eruptions in the Valles caldera, New Mexico: Geology, v. 24, p. 7-10.

Reneau, S.L., McDonald, E.V., Gardner, J.N., Kolbe, T.R., Carney, J.S., Watt, P.M. and Longmire, P.A., 1996, Erosion and deposition on the Pajarito Plateau, New Mexico and implications for geomorphic responses to late Quaternary climatic changes: New Mexico Geological Society, Guidebook 47.

Reneau, S.L., Raymond, R., Jr., Broxton, D.E., Vaniman, D., Byers, F.M., Jr., Chipera, S.J., Kluk, E.C., Warren, R.G., Kolbe, T.R., Simpson, D.T., Carney, J.S., Gardner, J.N. and Olig, S.S., 1995, Geological site characterization for the proposed Mixed Waste Disposal Facility, Los Alamos National Laboratory: Los Alamos National Laboratory, Report No. LA-13089-MS.

Renick, B.C., 1931, Geology and ground-water resources of western Sandoval County, New Mexico: U.S. Geological Survey, Water-Supply Paper 620, 117 p.

Rigby, J.K. Jr., 1982, *Camarasaurus* cf. *supremus* from the Morrison Formation near San Ysidro, New Mexico -- the San Ysidro dinosaur: New Mexico Geological Society, Guidebook 33, p. 271-272.

Roberts, P.M., Aki, K. and Fehler, M.C., 1991, A low-velocity zone in the basement beneath the Valles caldera, New Mexico: Journal of Geophysical Research v. 96(B13), p. 21,583-21,596.

Roberts, P.M., Aki, K. and Fehler, M.C., 1995, A shallow attenuating anomaly inside the ring-fracture of the Valles caldera, New Mexico: Journal of Volcanology and Geothermal Research, v. 67, p. 79-99.

Rogers, J.B., 1996, The Quaternary fluvial geomorphic evolution of the southwestern Jemez Mountains and the Valles caldera, Jemez Mountains, New Mexico [M.S. thesis]: Albuquerque, University of New Mexico.

Rogers, J.B. and Smartt, R.A., 1996, Climatic influences on Quaternary alluvial

stratigraphy and terrace formation in the Jemez River valley, New Mexico: New Mexico Geological Society, Guidebook 47.

Rogers, M.A., 1977, History and environmental setting of LASL near-surface land disposal facilities for radioactive wastes (Areas A, B, C, D, E, F, G and T), a source document: Los Alamos National Laboratory, Report LA-6848-MS, v. I, 260 p.

Rogers, M.A., 1995, Geologic map of Los Alamos National Laboratory Reservation: State of New Mexico Environment Department, scale 1:400, 21 p.

Rogers, W.M., Loloff, R., Witcher, J. and Stokes, K., 1988, Pueblo of Zia; geothermal resources assessment phase 1, prefeasibility investigation: Council of Energy Resource Tribes, Denver, Colorado.

Romer, A.S., 1937, New genera and species of pelycosaurian reptiles: New England Zoological Club, Proceedings, v. 16, p. 89-96.

Romer, A.S., 1960, The vertebrate fauna of the New Mexico Permian: New Mexico Geological Society, Guidebook 11, p. 48-54.

Ross, C.S., Smith, R.L. and Bailey, R.A., 1961, Outline of the geology of the Jemez Mountains, New Mexico: New Mexico Geological Society, Guidebook 12, p. 139-143.

Sasada, M., 1988, Microthermometry of fluid inclusions from the VC-1 corehole in Valles caldera, New Mexico: Journal of Geophysical Research, v. 93(B6), p. 6091-6096.

Sasada, M. and Goff, F., 1995, Fluid inclusion evidence for rapid formation of the vapor-dominated zone at Sulphur Springs, Valles caldera, New Mexico, USA: Journal of Volcanology and Geothermal Research, v. 67, p. 161-169.

Sass, J.H. and Morgan P., 1988, Conductive heat flux in VC-1 and the thermal regime of Valles caldera, Jemez Mountains, New Mexico: Journal of Geophysical Research, v. 93(B6), p. 6027-6040.

Segar, R.L., 1974, Quantitative gravity interpretation: Valles caldera area, Sandoval and Rio Arriba Counties, New Mexico, University of Utah Research Institute, Earth Science Lab, Open-file Report, NM-BACA-27, 12 p.

Self, S., Goff, F., Gardner, J.N. Wright, J.V. and Kite, W.M., 1986, Explosive rhyolitic volcanism in the Jemez Mountains: vent locations, caldera development and relation to regional structure: Journal of Geophysical Research, v. 91, p. 1779-1798.

Self, S., Wolff, J.A., Spell, T.L., Skuba, C.E. and Morrissey, M.M., 1991, Revisions to the stratigraphy and volcanology of the post-0.5 Ma units and the volcanic section of VC-1 core hole, Valles caldera, New Mexico: Journal of Geophysical Research, v. 96, p. 4107-4116.

Shevenell, L. and Goff, F., 1995, The use of tritium in groundwater to determine fluid mean residence times of Valles caldera hydrothermal fluids, New Mexico, USA: Journal of Volcanology and Geothermal Research, v. 67, p. 187-205.

Shevenell, L., Goff, F., Vuataz, F., Trujillo, P., Counce, D., Janik, C. and Evans, W., 1987, Hydrogeochemical data for thermal and nonthermal waters and gases of the Valles caldera-southern Jemez Mountains region, New Mexico: Los Alamos National Laboratory, Report LA-10923-OBES, 100 p.

Siemers, C.T., 1975, Road logs: Upper Jurassic and Upper Cretaceous stratigraphy and sedimentology -- eastern San Juan Basin: Field trips to central New Mexico, Rocky Mountain Sections of the American Association of Petroleum Geologists and Society of Economic Paleontologists and Mineralogists, p. 7-26.

Simpson, J.H., 1850, Report from the Secretary of War, communicating the report of Lieutenant J.H. Simpson of an expedition into the Navajo country in 1849; and, also, the report of Captain S.G. French relative to the road opened between San Antonio and El Paso del Norte: U.S. 31st Congress, First Session, Senate Executive Document 64, p. 55-138, 146-148.

Slack, P.B. and Campbell, J.A., 1976, Structural geology of the Rio Puerco fault zone and its relationship to central New Mexico tectonics; New Mexico Geological Society, Special Publication 6, p. 46-52.

Smith, G.A. and Katzman, D., 1991, Discrimination of eolian and pyroclastic-surge processes in the generation of cross-bedded tuffs, Jemez Mountains volcanic field, New Mexico: Geology, v. 19, p. 465-468.

Smith, G.A., Larsen, D., Harland, S.S., McIntosh, W.C., Erskine, D.W. and Taylor, S., 1991, A tale of two volcaniclastic aprons: field guide to the sedimentology and physical volcanology of the Oligocene Espinaso Formation and Miocene Peralta Tuff, north-central New Mexico: New Mexico Bureau of Mines and Mineral Resources, Bulletin 137, p. 87-103.

Smith, G.A. and Lavine, A., 1994, What is the Cochiti Formation?: New Mexico Geology, v. 16, p. 56.

Smith, R.L., 1960, Ash flows: Geological Society of America Bulletin, v. 71, p. 795-842.

Smith, R.L., 1979, Ash-flow magmatism: Geological Society of America, Special Paper 180, p. 5-27.

Smith, R.L. and Bailey, R.A., 1966, The Bandelier Tuff: a study of ash-flow eruption cycles from zoned magma chambers: Bulletin Volcanologique, v. 29, p. 83-104.

Smith, R.l. and Bailey, R.A., 1968, Resurgent cauldrons: Geological Society of America, Memoir 116, p. 613-662.

Smith, R.L., Bailey, R.A. and Ross, C.S., 1970, Geologic map of the Jemez Mountains, New Mexico: U.S. Geological Survey, Miscellaneous Investigations Map 1-571, scale 1:125,000.

Smith, S.P. and Kennedy, B.M., 1985, Noble gas evidence for two fluids in the Baca (Valles caldera) geothermal reservoir: Geochemica et Cosmochimica Acta, v. 49, p. 893-902.

Sommer, M.A., 1977, Volatiles, H_2O, CO_2, and CO in silicate melt inclusions in quartz phenocrysts from the rhyolitic Bandelier air-fall and ash-flow tuff, New Mexico: Journal of Geology, v. 85, p. 423-432.

Spell, T.L. and Harrison, T.M. 1993, $^{40}Ar/^{39}Ar$ geochronology of post-Valles caldera rhyolites, Jemez volcanic field, New Mexico: Journal of Geophysical Research, v. 98, p. 8031-8051.

Spell, T.L., Harrison, T.M. and Wolff, J.A., 1990 $^{40}Ar/^{39}Ar$ dating of the Bandelier Tuff and San Diego Canyon ignimbrites, Jemez Mountains, New Mexico: temporal constraints on magmatic evolution: Journal of Volcanology and Geothermal Research, v. 43, p. 175-193.

Spell, T.L. and Kyle, P.R., 1989, Petrogenesis of Valle Grande Member rhyolites, Valles caldera, New Mexico: implications for evolution of the Jemez Mountains magmatic system: Journal of Geophysical Research, v, 94(B8), p. 10,379-10,396.

Spell, T.L. Kyle, P.R., Thirlwall, M.F. and Campbell, A.R., 1993, Isotopic and geochemical constraints on the origin and evolution of postcollapse rhyolites in the Valles caldera, New Mexico: Journal of Geophysical Research, v. 98, p. 19,723-19,739.

Spiegel, Z. and Baldwin, B., 1963, Geology and water resources of the Santa Fe area, New Mexico: U.S. Geological Survey, Water-Supply Paper 1525, 258 p.

Starquist, V.L., 1988, Core log, Valles Caldera #2A, New Mexico: Los Alamos National Laboratory, Report LA-11176-MS, 87 p.

Stearns, T.B., 1981, Palynological evidence of the effective prehistoric environment; *in* Baker, C. and Winter, J.C., eds., High altitude adaptations along Redondo Creek - the Baca Geothermal Anthropological Project: Albuquerque, Office of Contract Archeology, University of New Mexico, p. 25-39.

Stimac, J.A., Hickmott, D., Abell, R., Larocque, A., Broxton, D.E., Gardner, J.N. and Chipera, S.J., in press, Redistribution of Pb and other volatile trace metals during eruption, devitrification and vapor-phase crystallization of the Bandelier Tuff, Nw Mexico: Journal of Volcanology and Geothermal Research.

Stix, J., Goff, F., Gorton, M., Heiken, G. and Garcia, S.R., 1988, Restoration of compositional zonation in the Bandelier silicic magma chamber between two caldera-forming eruptions: geochemistry and origin of the Cerro Toledo Rhyolite, Jemez Mountains, New Mexico: Journal of Geophysical Research, v. 93(B6), p. 6129-6147.

Stix, J. and Gorton, M., 1990, Variations in trace element partition coefficients in sanidine in the Cerro Toledo Rhyolite, Jemez Mountains, New Mexico: effects of composition, temperature and volatiles: Geochemica et Cosmochimica Acta, v. 54, p. 2697-2708.

Stoker, A.K., Purtymun, W.D., McLin, S.G. and Maes, M.N. 1991, Extent of saturation in Mortandad Canyon: Los Alamos National Laboratory, Report LA-UR-91-1660.

Sturchio, N. and Binz, C., 1988, Uranium-series age determination of calcite veins, VC-1 drill core, Valles caldera, New Mexico: Journal of Geophysical Research, v. 93(B6), p. 6097-6102.

Suhr, G., 1981, Seismic crust anomaly under the Valles caldera in New Mexico, USA: Unpublished Consulting Report, PRAKLA-SIESMOS GMBH, Hanover, Federal Republic of Germany, 56 p.

Summers, W.K., 1976, Catalog of thermal waters in New Mexico: New Mexico Bureau of Mines and Mineral Resources, Hydrologic Report 4, 80 p.

Sutherland, P.K. and Harlow, F.H., 1967, Late Pennsylvanian brachiopods from north-central New Mexico: Journal of Paleontology, v. 41, p. 1065-1089.

Swanson, F.J., 1981, Fire and geomorphic processes; *in* Mooney, H.A., Bonnicksen, T.M., Christensen, N.L., Lotan, J.E. and Reiners, W.A., Proceedings of the conference on fire regimes and ecosystem properties: Washington, D.C., Department of Agriculture, Forest Service General Technical Report WO-26, p. 401-420.

Swenson, D.R., 1977, Stratigraphy, petrology and environments of deposition of the upper part of the Madera Formation near Jemez Springs, New Mexico [M.S. thesis], Albuquerque, University of New Mexico, 172 p.

Swetnam, T.W. and Baisan, C.H., in press, Historical fire regime patterns in the southwestern United States since AD 1700; *in* Allen, C.D. and Eskew, L., Proceedings of the 1994 symposium on the La Mesa fire: Fort Collins, U.S. Department of Agriculture Service, General Technical Report RM-XXX.

Swetnam, T.W. and Betancourt, J.L., 1990, Fire-southern oscillation relations in the southwestern United States: Science, v. 249, p. 1017-1020.

Tedford, R.H., 1981, Mammalian biochronology of the late Cenozoic basins of New Mexico: Geological Society of America Bulletin, v. 92, pt. 1, p. 1008-1022.

Tedford, R.H., 1982, Neogene stratigraphy of the northwestern Albuquerque basin: New Mexico Geological Society, Guidebook 33, p. 273-278.

Touchan, R., Allen, C.D. and Swetnam, T.W., in press, Fire history and climatic

patterns in ponderosa pine and mixed-conifer forests of the Jemez Mountains, northern New Mexico; *in* Allen, C.D. and Eskew, L., Proceedings of the 1994 symposium on the La Mesa fire: Fort Collins, U.S. Department of Agriculture Forest Service, General Technical Report RM-XXX.

Toyoda, S., Goff, F., Ikeda, S. and Ikeya, M., 1995, ESR dating of quartz phenocrysts in the El Cajete and Battleship Rock Members of Valles Rhyolite, Valles caldera, New Mexico: Journal of Volcanology and Geothermal Research, v. 67, p. 29-40.

Trainer, F.W., 1974, Ground water in the southwestern part of the Jemez Mountains volcanic region, New Mexico: New Mexico Geological Society, Guidebook 25, p. 337-345.

Trainer, F.W., 1975, Mixing of thermal and nonthermal waters in the margin of the Rio Grande rift, Jemez Mountains, New Mexico: New Mexico Geological Society, Guidebook 26, p. 213-218.

Trainer, F.W., 1984, Thermal mineral springs in Cañon de San Diego as a window into Valles caldera, New Mexico: New Mexico Geological Society, Guidebook 35, p. 249-255.

Truesdell, A.H. and Janik, C.J., 1986, Reservoir processes and fluid origins in the Baca geothermal system, New Mexico: Journal of Geophysical Research, v. 91(B2), p. 1817-1833.

Trujillo, P.E., Counce, D., Grigsby, C., Goff, F. and Shevenell, L., 1987, Chemical analysis and sampling techniques for geothermal fluids and gases at the Fenton Hill Laboratory: Los Alamos National Laboratory, Report LA-11006-MS, 84 p.

Turin, H.J., 1995, Subsurface transport beneath MDAG: a conceptual model: Los Alamos National Laboratory, Report No. LA-UR-95-1663.

Vieth, F.E., 1950, The rise and decline of the Cochiti (Bland) Mining District [M.A. thesis]: Albuquerque, University of New Mexico, 95 p.

Vincelette, R.R. and Chittum, W.E., 1981, Explorations for oil accumulations in Entrada Sandstone, San Juan Basin, New Mexico: American Association of Petroleum Geologists Bulletin, v. 65, p. 2546-2570.

Vuataz, F.-D. and Goff, F., 1986, Isotope geochemistry of thermal and nonthermal waters in the Valles caldera, Jemez Mountains, northern New Mexico: Journal of Geophysical Research, v. 91 (B2), p. 1835-1853.

Vuataz, F.-D., Goff, F., Foulliac, C. and Calvez, J.-Y., 1988, A strontium isotope study of the VC-1 core hole and associated hydrothermal fluids and rocks from the Valles caldera, Jemez Mountains, New Mexico: Journal of Geophysical Research, v. 93(B6), p. 6059-6067.

Wachs, D., Harrington, C.D., Gardner, J.N. and Maassen, L.W., 1988, Evidence of young fault movements on the Pajarito fault system in the area of Lows Alamos, New Mexico: Los Alamos National Laboratory, Report LA-11156-MS, 23 p.

Warshaw, C.M. and Smith, R.L., 1988, Pyroxenes and fayalites in the Bandelier Tuff, New Mexico: temperatures and comparison with other rhyolites: American Mineralogist, v. 73, p. 1025-1037.

Waters, F., 1963, Book of the Hopi, Penguin Books, New York, p. 21.

Wells, S.G., Kelson, K.I. and Menges, C.M., 1987, Quaternary evolution of fluvial systems in the northern Rio Grande rift, New Mexico and Colorado: implications for entrenchment and integration of drainage systems, *in* Menges, C.M., Quaternary tectonics, landform evolution, soil chronologies and glacial deposits--northern Rio Grande rift of New Mexico: Friends of the Pleistocene-Rocky Mountain Cell, Fieldtrip Guidebook, p. 55-69.

Welton, B.J. and Farish, R.F., 1993, The collector's guide to fossil sharks and rays from the Cretaceous of Texas: Before Time, Lewisville, Texas, 204 p.

White, A.F., 1986, Chemical and isotopic characteristics of fluids within the Baca geothermal reservoir, Valles caldera, New Mexico: Journal of Geophysical Research, v. 91(B2), p. 1855-1866.

White, W.D., in press, Geomorphic response of six headwater basins fifteen years after the La Mesa Fire; *in* Allen, C.D. and Eskew, L., Proceedings of the 1994 symposium on the La Mesa fire: Fort Collins, U.S. Department of Agriculture Forest Service, General Technical Report RM-XXX.

White, W.D. and Wells, S.G., 1984, Geomorphic effects of La Mesa Fire: *in* Foxx, T.S., compiler, La Mesa fire symposium: Los Alamos National Laboratory, Report LA-9236-NERP, p. 73-90.

Whitney, M.I., 1978, The role of vorticity in developing lineation by wind erosion: Geological Society of America Bulletin, v. 89, p. 1-18.

Williamson, T.E., Kirkland, J.I. and Lucas, S.G., 1993, Selachians from the Greenhorn cyclothem ("middle" Cretaceous: Cenomanian-Turonian), Black Mesa, Arizona and the paleogeographic distribution of Late Cretaceous selachians: Journal of Paleontology, v. 67, p. 447-474.

Williamson, T.E. and Lucas, S.G., 1992, Selachian fauna from the Upper Cretaceous (Coniacian) El Vado Sandstone Member of the Mancos Shale, San Juan Basin, New Mexico: New Mexico Geological Society, Guidebook 43, p. 17-19.

WoldeGabriel, G., 1990, Hydrothermal alteration in the Valles caldera ring fracture zone and core hole VC-1: evidence for multiple hydrothermal systems: Journal of Volcanology and Geothermal Research, v. 40, p. 105-122.

WoldeGabriel, G., 1993, K/Ar dating of clinoptilolites: methods and preliminary results: Zeolite 93, 4th International Conference on the Occurrence, Properties and Utilization of Natural Zeolites, Program and Abstracts, Boise, Idaho, p. 216-218.

WoldeGabriel, G. and Goff, F., 1989, Temporal relationships of volcanism and hydrothermal systems in two areas of the Jemez volcanic field: Geology, v. 17, p. 986-989.

WoldeGabriel, G. and Goff, F., 1992, K/Ar dates of hydrothermal clays from core hole VC-2B, Valles caldera, New Mexico and their relation to alteration in a large hydrothermal system: Journal of Volcanology and Geothermal Research, v. 50, p. 207-230.

WoldeGabriel, G., Laughlin, A.W., Dethier, D. and Heizler, M., 1996, Temporal and geochemical trends of volcanic rocks in the White Rock Canyon of the Pajarito Plateau, Jemez volcanic field, New Mexico: New Mexico Geological Society, Guidebook 47.

Wolff, J. and Gardner, J.N., 1995, Is the Valles caldera entering a new cycle of activity? Geology, v. 23, p. 411-414.

Woodward, L.A., 1987, Geology and mineral resources of Sierra Nacimiento and vicinity, New Mexico: New Mexico Bureau of Mines and Mineral Resources, Memoir 42, 84 p.

Woodward, L.A, 1994, Restoration of Laramide right-lateral strike slip in northern New Mexico by using Proterozoic piercing points: tectonic implications from the Proterozoic to the Cenozoic: Comment: Geology, v. 22, p. 862-863.

Woodward, L.A., Hultgren, M.C., Crouse, D.L. and Merrick, M.A., 1992, Geometry of Nacimiento-Gallina fault system, northern New Mexico: New Mexico Geological Society, Guidebook 43, p. 103-107.

Woodward, L.A., Leonard, M.L., Lucas, S.G. and Connolly, J.R., 1989, Road log from Albuquerque to San Ysidro, San Juan Basin and return to Albuquerque: Energy Frontiers in the Rockies, Albuquerque Geological Society, p. 13-22.

Woodward, L.A. and Ruetschilling, R.L., 1976, Geologic map and sections of the San Ysidro quadrangle, New Mexico: New Mexico Bureau of Mines and Mineral Resources, Geologic Map 37, scale 1:24,000.

Wronkiewicz, D.J., Norman, D.I., Parkison, G.A. and Emanuel, K.M., 1984, Geology of the Cochiti Mining District, Sandoval County, New Mexico: New Mexico Geological Society, Guidebook v. 35, p. 219-222.

Wynkoop, W.C., 1900, "The Cochiti District, New Mexico," *in* The Engineering and Mining Journal, v. 70, August 25, 1900, p. 215-217.

Zidek, J., 1988, Hamilton quarry (Kansas, Late Pennsylvanian) Chondrichthyes: Kansas Geological Survey Guidebook, v. 6 p. 167-172.

Zidek, J. and Kietzke, K.K., 1993, Pre-Permian vertebrates of New Mexico, with remarks on some Early Permian specimens: New Mexico Museum of Natural History and Science, Bulletin 2, p. 1-10.