

# Service/News

Starred items (\*) available from New Mexico Bureau of Mines and Mineral Resources

## New publications

### NMBMMR

**\*Hydrogeologic Sheet 2**—Hydrogeology of Ambrosia Lake-San Mateo area, McKinley and Cibola Counties, New Mexico, by R. C. Brod and W. J. Stone, 1981, 1 sheet (scale 1:62,500), 5 tables, 10 figs. Covers Ambrosia Lake, San Lucas Dam, Dos Lomas, and San Mateo 7½-min quadrangles; shows hydrogeology and major aquifers in the heart of the Grants uranium region, 10 mi north of Grants. Aquifer characteristics, water-quality data, well records, and municipal and domestic water use are discussed. \$3.50

### USGS

#### PROFESSIONAL PAPERS

**1119-D**—Potassium-argon and fission-track zircon ages of Cerro Toledo Rhyolite tephra in the Jemez Mountains, New Mexico, by G. A. Izett, J. D. Obradovich, C. W. Naeser, and G. T. Cebula, in *Shorter contributions to isotope research in the Western United States 1980*, 1981, 47 p. \$4.25

#### NEW TOPOGRAPHIC MAPS

**\*Arroyo Serrano West**, 1981, lat. 33°37'30", scale 1:24,000, contour interval 20 ft  
**\*Capitan Pass**, 1981, lat. 33°30', long. 105°22'30", scale 1:24,000, contour interval 40 ft  
**\*Cowboy Mesa NE**, 1981, lat. 34°7'30", long. 105°, scale 1:24,000, contour interval 10 ft

## Open-file reports

### NMBMMR

**\*127**—Hydrocarbon source-rock evaluation study, organic geochemical analyses of dry-well cuttings Exxon Corp. Prisor unit fed. #1 well, Sierra County, New Mexico, by P. J. Cernock, 26 p. \$5.20  
**\*130**—Water-level data compiled for hydrogeologic study of Animas Valley, Hidalgo County, New Mexico, by Keith O'Brien and William J. Stone, 1981, 66 p. \$13.20  
**\*138**—Uranium potential of the Datil Mountains-Pie Town area, Catron County, New Mexico, by Richard M. Chamberlin, 1981, 58 p. \$11.60  
**\*139**—Geologic quadrangle maps for the Socorro-Magdalena area, Socorro County, New Mexico—geology of the Molino Peak quadrangle, by Glenn R. Osburn, David M. Petty, and C. E. Chapin, 1981, 24 p., 2 maps \$6.80  
**\*140**—Hydrocarbon source-rock evaluation study, Hachita dome, Inc. no. 1 Tidball-Berry federal well, Hidalgo County, New Mexico, by Paul Tybor, GeoChem Laboratories, Inc., 1981, 13 p. (including 2 p. text, 8 tables, 2 charts) \$2.60  
**\*142**—Geology and coal resources of Cantaralo Spring 7½' quadrangle, by Orin Anderson, 1981, 13 p., 2 maps \$4.60  
**\*143**—Geology and coal resources of Twentytwo Spring quadrangle, by Stephen J. Frost, 1981, 22 p., 1 map \$5.40  
**\*144**—Geology and coal resources of Cerro Prieto and Dyer quadrangles, by F. Campbell, 1981, 60 p., 2 maps \$14.00  
**\*146**—Geology of the tenth potash ore zone—Permian Salado Formation, Carlsbad district, New

Mexico, by Robert C. M. Gunn and John M. Hills, 1981, 46 p. \$9.20

**\*149**—Hydrocarbon source-rock evaluation study, Cockrell Corp. No. 1 Coyote State well, Grant County, New Mexico, by L. Paul Tybor, GeoChem Laboratories, Inc., 1981, 17 p. \$3.40

**\*151**—Hydrocarbon source-rock evaluation study, Cockrell Corp. No. 1 Playas state well, Hidalgo County, New Mexico, by L. P. Tybor, GeoChem Laboratories, Inc., 1981, 23 p. \$4.60

### USGS

**80-0169**—Irrigated cropland, 1978, Curry County, New Mexico, by Bruce Wright, 1980, scale 1:250,000  
**80-0259**—Land use and land cover and associated maps for Hobbs, Texas, New Mexico, 1980, 2 sheets, scale 1:250,000

**80-0260**—Land use and land cover and associated maps for Clovis, Texas, New Mexico, 1980, 2 sheets, scale 1:250,000

**80-0261**—Land use and land cover and associated maps for Brownfield, Texas, New Mexico, 1980, 2 sheets, scale 1:250,000

**80-0262**—Land use and land cover and associated maps for Dalhart, Texas, Oklahoma, New Mexico, Colorado, Kansas, 1980, 2 sheets, scale 1:250,000

**80-1231**—Scanning electron micrographs of modern chrysoomonad cysts from Castor Pond, Jemez Mountains, New Mexico, by D. P. Adam and P. J. Mehringer, Jr., 18 p.

**80-2014**—Time-term solutions and corresponding data for the crustal structure of north-central New Mexico, by J. N. Murdock and L. H. Jaksha, 40 p.

**80-2018**—Part III of III, Genetic-geologic model for tabular humate deposits, Grants mineral belt, San Juan Basin, New Mexico, by H. C. Granger, W. I. Finch, A. R. Kirk, and R. E. Thaden, in *Research on uranium resource models*, a progress report, 157 p., 1 over-size sheet

**81-0040**—Principal facts for gravity stations and base station net in the Silver City 1° by 2° quadrangle, Arizona and New Mexico, by J. C. Wynn, 1981, 141 p.

**81-0088**—Aeromagnetic map of an area south of Chama, New Mexico, 1 over-size sheet, scale 1:62,500

**81-0161**—Fission-track ages of air-fall tuffs in Miocene sedimentary rocks of the Española Basin, Santa Fe County, New Mexico, by G. A. Izett and C. W. Naeser, 10 p.

**81-0172**—Geophysical log suite from drill holes No. 1 and 2, Mariano Lake-Lake Valley drilling project, McKinley County, New Mexico, 8 p., 7 over-size sheets

**81-31**—Geology of Nash Draw, Eddy County, New Mexico, by George O. Bachman, 8 p., 2 tables, 1 fig., 4 plates (in pocket)

**81-37**—A seismicity and seismotectonic study of the Kermit seismic zone, Texas, prepared by the U.S. Geological Survey

**81-242**—Stratigraphic sequence measured from Jurassic Todilto Limestone to Cretaceous Dakota Sandstone, west side of San Juan Basin, near Crystal, San Juan County, New Mexico, by V. P. Byers, 35 p.

**81-294**—Analyses of sieved stream sediments and the magnetic and nonmagnetic fractions of pan concentrates from the San Lorenzo 15' quadrangle, southwestern New Mexico, by J. M. Nishi, K. C. Watts, and H. V. Alminas, 123 p.

**81-439**—Geophysical log suite from drill hole no. 3, Mariano Lake-Lake Valley drilling project, McKinley County, New Mexico, prepared by the U.S. Geological Survey

**81-468**—Geologic data for borehole ERDA-6, Eddy County, New Mexico, prepared by the U.S. Geological Survey

**81-557**—Mineral resource potential of the El Malpais Instant Study Area and adjacent areas, Valencia County, New Mexico, prepared by the U.S. Geological Survey

**81-657**—Bouguer gravity map of the San Juan Basin area, Colorado, Arizona, and New Mexico, prepared by the U.S. Geological Survey

**81-783**—Coal resources of the Fruitland Formation, Ojo Encino EMRIA Study Site, McKinley County, New Mexico, by Gary B. Schneider and Mark A. Kirschbaum, 1981, 26 p.

**81-0242**—Stratigraphic sequence measured from Jurassic Todilto Limestone to Cretaceous Dakota Sandstone, west side of San Juan Basin, near Crystal, San Juan County, New Mexico, by V. P. Byers, 1981, 35 p.

**81-1080**—Quartz-pyrite-molybdenite stockwork near South Fork Peak, Taos County, New Mexico, by Steve Ludington, 1981, 8 p., 1 table, 4 figs.

## New projects

### USGS

**9420-03040**—Coal geology of Grants 1° quadrangle, New Mexico, by D. A. Jobin. To conduct coal resource assessment and coal geology investigations on the Grants 1° quadrangle through geologic mapping, construction of correlation diagrams and cross sections, and delineation of coal-bed or coal-zone occurrence and distribution and establishment of a coal geology framework; and to provide map and stratigraphic data to the National Coal Resources Data System (NCRDS) for coal quantity and quality determination.

**9420-03050**—Coal resources, Toadlena, New Mexico, by W. J. Mapel, scale 1:100,000. To conduct coal resource assessment and coal geology investigations on the Toadlena quadrangle through geologic mapping, construction of correlation diagrams and cross sections, and delineation of coal-bed or coal-zone occurrence and distribution and establishment of a coal geology framework. To provide map and stratigraphic data to the National Coal Resources Data System (NCRDS) for coal quantity and quality determination.

**9420-03051**—Coal resources, Gallup, New Mexico, by W. J. Mapel, scale 1:100,000. To conduct coal resource assessment and coal geology investigations on the Gallup quadrangle through geologic mapping, construction of correlation diagrams and cross sections, and delineation of coal-bed or coal-zone occurrence and distribution and establishment of a coal geology framework. To provide map and stratigraphic data to the National Coal Resources Data System (NCRDS) for coal quantity and quality determination.

**9430-03047**—Mineralogy and geochemistry of clays associated with uranium, by C. Gene Whitney. To study the clay minerals associated with uranium deposits in the San Juan Basin; to understand the spatial, geochemical, and genetic relationship between the clay minerals and the uranium mineralization.

## Abstract

URANIUM POTENTIAL OF DATIL MOUNTAINS-PIE TOWN AREA, CATRON COUNTY, NEW MEXICO, by Richard M. Chamberlin, Economic Geologist, New Mexico Bureau of Mines and Mineral Resources, Socorro, NM

The Datil Mountains-Pie Town area lies along the southern margin of the Colorado Plateau and the northern eroded margin of the Datil-Mogollon volcanic field. Cretaceous and Cenozoic strata, dipping gently southward under the area, are cut by northeast- and northwest-trending faults and folds related to Laramide compression and late Cenozoic extension. Several small uranium deposits in the Red Basin mine area occur along the base of a lateritic-weathering exhumed zone ("C" horizon of a paleosol), which is as much as 150 ft thick. The paleosol was developed on, and within, carbon-rich sandstones and shales of the Crevasse Canyon Formation (Late Cretaceous) in Paleocene (?) time. Tropical or subtropical weathering leached trace concentrations of uranium (10-25 ppm) from the Crevasse Canyon shales in the upper vadose zone of the weathering profile. Uranium was redeposited below the water table at redox boundaries (analogous to soil gleys?) that formed in a zone of oxidizing and actively flowing groundwater about 20-50 ft thick. Combined effects of composite fluvial aquifers, folding of beds, and paleotopography produced a complex array of small roll fronts; however, the overall hydrologic gradient appears to have been easterly. In Eocene time, the uranium-bearing weathered zone was locally scoured by southeast-trending paleovalleys, which were then filled and buried by as much as 1,900 ft of fluvial and interfluvial red beds of the Baca Formation. Some uranium may have been flushed from the weathered zone by shallow groundwater flow in early Baca time, but most of the uranium deposits were preserved during Eocene to Miocene time by burial beneath the Baca Formation and as much as 2,000-3,000 ft of volcanic rocks of the Datil-Mogollon field. In late Cenozoic time, southward tilting, uplift, and erosion has exposed the post-Crevasse Canyon pre-Baca paleosol along the north flank of the Datil Mountains. Numerous fossil roll fronts, which were largely leached of uranium in Quaternary time, are exposed along the truncated northern edge of the paleosol. Some fossil roll fronts appear to be as much as a mile long, 40 ft high, and 30 (?) ft wide. Unleached, but otherwise similar, roll-front deposits should be preserved in the down-dip projection of the paleosol where it lies below the present water table. Extrapolation of published data on the Red Basin reserve area suggests that at least 15 million lbs, and as much as 30-45 million lbs, of U<sub>3</sub>O<sub>8</sub> should be present under a relatively unexplored area of about 80 mi<sup>2</sup> where the pre-Baca paleosol is at a depth of less than 1,000 ft. Outcrop belts of conglomeratic sandstone in the Baca Formation, which appear to represent braided channel complexes, are locally bleached and contain epigenetic uranium occurrences that pseudomorph syngenetic concentrations (placers) of iron oxides. The Baca sandstones have favorable aquifer characteristics, but their subsurface capacity to act as a trap for uranium deposits is presently unknown.

## MINING REGISTRATIONS (MARCH 3, 1981 TO JUNE 1, 1981)

State Mine Inspector

2340 Menaul N.E.

Albuquerque, NM 87107

Date and operation	Operators and owners	Location
3-3-81 uranium	Operator—Haystack—underground, Todilto Exploration & Dev., 3810 Academy Parkway St. NE, Albuquerque, NM; Gen. Mgr.: George Warnock, same address, ph: 345-8391; Person in charge: Thomas Roman, P.O. Box 5051, Milan, NM, ph: 345-8391 Property owner—Todilto Explor.	McKinley Co.; secs. 13, 19; T. 13 N., R. 11 W., 10 W.; Grants mining district; uranium; Haystack Mtn. round from old US-66 between Prewitt and Milan, NM; private, federal land
3-20-81 mill	Operator—Phelps Dodge Tyrone Branch, Jack Whisler, Inc., 1001 Wall St., El Paso, TX 79915 (surface subcontractor); Gen. Mgr.: Joseph S. Hanawalt, same address; Job Supt.: Jesus Chavez or Isidro Perez, 7239 Alameda Sp. 103, El Paso, TX, P.O. Box 410, Clint TX; Other official: Armando Telles, Address: same as company Property owner—Phelps Dodge	Grant Co.; secs. 22-14, T. 19 S., R. 15 W.; Burro Mountain mining district; copper; no custom milling; 13½ mi SW of Silver City, NM on NM-90; private land
3-20-81 mill	Operator—Grafton mill, Sunspot Minerals, Inc., Box 117, Winston, NM 87943, ph: (505) 894-7128; Supt.: Caesar Fulton, same address and phone Property owner—U.S. Government	Sierra Co.; secs. 22, 23, T. 10 S., R. 9 W.; Grafton mining district; gold and silver; no custom milling; capacity of mill—100 TPD; near Grafton, NM, townsite, up Turkey Creek road; federal land
3-20-81 silver	Operator—Old Beck, Beck Silver Mines, Inc., P.O. Box 275, Lordsburg, NM; Gen. Mgr.: Ronald W. Pugh, same address; Person in charge: Same; Gen. Supt.: Willis A. Pugh, same address Property owner—Beck Silver Mines, Inc.	Hidalgo Co.; sec. 31, T. 23 S., R. 21 W.; Kimball mining district; silver; underground and surface; 3½ mi north of Steins, NM; federal land
4-4-81 gold	Operator—Ol' 69'er, Smith-Yoder Resources, Inc., 11645 Nambé Ave. NE, Albuquerque, NM; Gen. Mgr.: H. David Yoder, same address, ph: 296-5098; Person in charge: Lamont Smith, Jr., 228 W. Mountain Ave., Las Cruces, NM, ph: 526-8485; Gen. Supt.: Richard G. Coonce, Ol' 69'er Mine, Golden, NM; Other official: Marvin Doyle, 616 Marcella Ave., Albuquerque, NM, ph: 299-4808 Property owner—BLM	Santa Fe Co.; sec. 21, T. 12 N., R. 7 E.; New Placers mining district; gold, metals; intersection I-40 and NM-14, go north to Golden, turn east through Golden, turn south up first canyon; mine is on south side of mountain that constitutes east side of canyon; federal land
4-4-81 gold	Operator—Gold Gulch, Paha Corporation, Box 1162, Silver City, NM 88061; Gen. Mgr.: Paul L. Hunter, 675 A Street, Silver City, NM, ph: 388-1428; Person in charge: same	Grant Co.; sec. 22; White Signal mining district; US-180 between Lordsburg and Silver City, turn off at Gold Gulch sign, proceed 5 mi; federal land
4-9-81 plant	Operator—Monument Pilot Leach Plant, Nufuels Corp; P.O. Drawer F, Crownpoint, NM 87313; Supt.: P. W. Richardson, Grants, NM; Gen. Mgr.: William L. Mason, Denver, Colorado; Plant Super.: J. E. Oakes, Thoreau, NM Property owner—Indian Allotted	McKinley Co.; sec. 28, T. 17 N., R. 13 W.; 2 mi south of Crownpoint on NM-57; uranium ore; capacity of plant—75 gpm
4-9-81 plant	Operator—Crownpoint S. Leach Pilot Plant, Nufuels Corp; P.O. Drawer F, Crownpoint, NM 87313; Supt.: P. W. Richardson, Grants, NM; Gen. Mgr.: William L. Mason, Denver, Colorado; Other official: H. Pete, Thoreau, NM Property owner—Indian Allotted	McKinley Co.; sec. 9, T. 17 N., R. 13 W.; 6 mi west of Crownpoint on Navajo Route 9; uranium ore; capacity of plant—75 gpm
4-9-81 mill	Operator—Anaconda Bluewater mill, Anaconda Copper Co., Newbery State, Inc. (contractor), P.O. Box 718, Pueblo, CO 81002; New Yellowcake Facility and #8 Thickener, Newbery Project Mgr.: Jack S. Cline, Box 5278, Milan, NM 87021; Gen. Mgr.: R. D. Lynn (Anaconda), P.O. Box 638, Grants, NM; Operations Mgr.: Mike Drozd (Anaconda), Same as above address Property owner—Anaconda Copper Co.	Cibola Co.; uranium ore; custom milling—no; capacity of mill—6,000 tons per day; private land
4-13-81 mine	Operator—Mount Royal, Summit Minerals, Inc., Box W, Duncan, AZ 85534; Gen. Mgr.: D. E. Hanson, same address, ph: (602) 359-2835; Person in charge: Juan Martinez, same address; Other official: Charles F. Hanson, same address Property owner—Mount Royal Mining & Exploration Co., Houston, TX	Grant Co.; sec. 23, T. 17 S., R. 21 W.; Steeplerock mining district; silver and gold; works—underground, stoping; private land; from the highway, 10 mi down the Carlisle Road
4-13-81 mine	Operator—Little Red Hill, American International Mining Co., 610 N. Bullard, Silver City, NM 88061; Gen. Mgr.: W. A. Burkhart, 610 N. Bullard, Silver City, NM, ph: 388-2536; Person in charge: E. E. Parrish, President, same address, ph: 388-2523; Other official: Dr. Philip Myers, Chairman of the Board, 22900 Ventura Blvd., Ste. 340, Woodland Hills, CA 61364	Sierra Co.; secs. 5, 6, T. 10 S., R. 5 W.; Goldsborough mining district; gold; type—lode; works—open pit; federal land; take the Mitchel Point offramp and go north on US-85 to the Pankey Ranch turnoff on the left. Go approximately 7 mi and turn to the right, and go 2 mi
4-17-81 gold	Operator—M&D, J. McCants & Co., Box 184, Hillsboro, NM 88042; Gen. Mgr.: J. McCants, same address, ph: 895-5351 Property owner—John & James McCants and Bobby Dawkins	Sierra Co.; sec. 6, T. 16 S., R. 6 W.; Animas mining district; gold; type—placer; works—surface; 5 mi east of Hillsboro, NM, south ½ mi on WKK Gulch; federal-BLM
5-12-81 copper, gold	Operator—San Pedro mine, The Goldfield Corp., Box 11398, Albuquerque, NM 87192; Gen. Mgr.: P. S. Freeman, 1700 Valdez NE, Albuquerque, NM, ph: 293-1468; Person in charge: same; Gen. Supt.: J. R. Nations, 1715 Morningrise SE, Albuquerque, NM, ph: 268-3495 Property owner—Goldfield Corporation, Box 1899, Melbourne, FLA 32901	Santa Fe Co.; sec. 27, T. 12 N., R. 7 E.; New Placers mining district; copper, gold; underground; 35 mi NE of Albuquerque via I-40 to NM-14, north to NM-344 and east 2 mi to mine road on left; private land

MINING REGISTRATIONS (continued)

Date and operation	Operators and owners	Location
5-12-81 gold, silver, lead mill	Operator—Resources of America, Inc., P.O. Box 705, Socorro, NM 87801; Supt.: Ruben Valenzuela, same address; Gen. Mgr.: David W. Smith, phone: 835-3511; previously operated by U.S. Mining & Milling Corp.	Socorro Co.; secs. 5, 8, T. 5 S., R. 1 E.; 1.4 mi south of San Antonio on old Rt 85
5-15-81 uranium	Operator—The Anaconda Copper Company, Box 638, Grants, NM 87020; Person in charge: John Anderson, phone: 552-6646; Gen. Mgr.: R. D. Lynn, phone: 876-2211; Supt.: John Anderson Property owner—The Anaconda Copper Co.	Valencia Co.; secs. 2, 3, T. 10 N., R. 5 W.; Leave I-40 at Laguna Exit, west on old US-66 to NM-279, north approximately 5 mi to intersection of Anaconda shop, turn right, mine office is 300 yds from intersection; deposit: underground; private land
5-18-81 uranium	Operator—The Anaconda Copper Company, Box 638, Grants, NM 87020; Person in charge: John Anderson, phone: 552-6646; Gen. Mgr.: R. D. Lynn, phone: 876-2211 Property owner—The Anaconda Copper Co.	Valencia Co.; secs. 2, 3, T. 10 N., R. 5 W.; Leave I-40 at Laguna Exit, west on old US-66 to NM-279, north approximately 5 mi to intersection of Anaconda shop, turn right, mine office is 300 yds from intersection; deposit: underground; private land
5-20-81 gold, silver	Operator—Deadwood Golden Hillside Mining Co., 5700 N. Campbell Ave., Tucson, AZ 85718; Person in charge: Dan Larranage, Box 94, Bayard, NM, phone: 537-3262; Official: James Aspell, 5700 N. Campbell, Tucson, AZ 85718	Catron Co.; Glenwood to Mogollon, then to sign to Deadwood mine; exploration, solely to rehabilitate the Deadwood mine shaft to permit geologists of mining companies to inspect and evaluate property; private land
6-1-81 uranium	Operator—Section 13, Homestake Mining Company, P.O. Box 98, Grants, NM 87020; Person in charge: Frank J. Murray, phone: 287-2968; Gen. Mgr.: John M. Parker, phone: 287-4456; Prod. Mgr.: Gary E. Boyer; previously operated by UN-HP Property owner—SF Pac. RR	McKinley Co.; sec. 13, T. 14 N., R. 10 W.; Grants mining district, Ambrosia Lake area; deposit: underground; private land
6-1-81 uranium	Operator—Section 15, Homestake Mining Company, P.O. Box 98, Grants, NM 87020; Person in charge: Frank J. Murray, phone: 287-2968; Gen. Mgr.: John M. Parker, phone: 287-4456; Prod. Mgr.: Gary E. Boyer; previously operated by UN-HP Property owner—SF Pac. RR	McKinley Co.; sec. 15, T. 14 N., R. 10 W.; Grants mining district, Ambrosia Lake area; deposit: underground; private land
6-1-81 uranium	Operator—Section 23, Homestake Mining Company, P.O. Box 98, Grants, NM 87020; Person in charge: Frank J. Murray, phone: 287-2968; Gen. Mgr.: John M. Parker, phone: 287-4456; Prod. Mgr.: Gary E. Boyer; previously operated by UN-HP Property owner—SF Pac. RR	McKinley Co.; sec. 23, T. 14 N., R. 10 W.; Grants mining district, Ambrosia Lake area; deposit: underground; private land
6-1-81 uranium	Operator—Section 25, Homestake Mining Company, P.O. Box 98, Grants, NM 87020; Person in charge: Frank J. Murray, phone: 287-2968; Gen. Mgr.: John M. Parker, phone: 287-4456; Prod. Mgr.: Gary E. Boyer; previously operated by UN-HP Property owner—SF Pac. RR	McKinley Co.; sec. 25, T. 14 N., R. 10 W.; Grants mining district, Ambrosia Lake area; deposit: underground; private land
6-1-81 uranium	Operator—Section 32, Homestake Mining Company, P.O. Box 98, Grants, NM 87020; Person in charge: Frank J. Murray, phone: 287-2968; Gen. Mgr.: John M. Parker, phone: 287-4456; Prod. Mgr.: Gary E. Boyer; previously operated by UN-HP Property owner—SF Pac. RR	McKinley Co.; sec. 32, T. 14 N., R. 9 W.; Grants mining district, Ambrosia Lake area; deposit: underground; state land
6-1-81 mill— uranium	Operator—Homestake Mining Co. P.O. Box 98, Grants, NM 87020; Mgr. of milling: Theodore R. Beck; Gen. Mgr.: John M. Parker; Prod. Mgr.: Gary E. Boyer; previously operated by UN-HP	Valencia Co.; sec. 26, T. 12 N., R. 10 W.; Grants mining district; NM-53 N.; ores milled or refined: uranium; custom milling; capacity of mill—3,000 tons per day

(TO BE CONTINUED NEXT ISSUE)

overlying Caballero Formation, a Tertiary-age sill of greenish-gray hornblende trachyandesite porphyry is located. The hornblende crystals weather out and form conspicuous grains, up to 2 cm long, on the slope of Oñate soil.

The rest of the Paleozoic sequence is outside the park, but it is easily accessible (to strong legs and lungs) along the ridge-Eyebrow Trail. These are the Caballero, Lake Valley, and Rancheria Formations (Mississippian) and the complex Gobbler, Beeman, and Holder Formations of Pennsylvanian age. The Bug Scuffle Limestone Member of the Gobbler Formation forms the prominent sheer 600-ft cliff crossed by the Eyebrow part of the trail. Above, and mainly to the east of Joplin Ridge, are the Permian units, the Laborcita-Bursum, Abo, Yeso, and San Andres Formations.

Fossils are present in all of the marine rocks but unfortunately in the Dog Canyon area they are sparse, occurring in hard dolomites and limestones, and difficult to collect.

The El Paso and Montoya formations crop out along the nature trail in the canyon; these two units along with the strata up to the Caballero Formation crop out along the ridge trail; farther east and north on the Eyebrow part of the trail, the Mississippian and Pennsylvanian formations occur. These rocks can be seen "up-canyon" from the eastern window of the Visitor Center at the geology display.

On the north side of the canyon above the Visitor Center, a cascade of yellow-brown rocks originates from a shaft, 15 ft deep and 4 ft wide, that cuts the Montoya and upper El Paso beds. This "mine" was dug along fractures carrying limonite-strained dolomite and calcite-lined vugs. No ore minerals were seen.

The well exposed rock strata of Dog Canyon are clues to the geologic history of the region, just as the artifacts of the area tell the tales of early American Indians, Apaches, Frenchy, and Oliver Lee.

**ACKNOWLEDGMENTS**—Any report on geology in the Sacramento Mountains draws heavily on the classic bulletin by Pray (1961). Much of the nongeologic material is from Wimberly, Eidenbach, and Betancourt (1979). Barbara Spence helped compile the geology. Peter Green, New Mexico State Parks and Recreation Division, encouraged us to review the geology of Dog Canyon to aid in the Visitor Center displays.

## Oliver Lee Memorial State Park *(continued from p. 60)*

of dark-gray massive coarsely crystalline dolomite (the Upham Dolomite), and an upper 100 ft of light to olive-gray, finely crystalline dolomite (the Aleman Dolomite) that contains numerous black chert seams and nodules.

The Late Ordovician Valmont Dolomite (or Cutter Dolomite of central New Mexico), about 150 ft thick, of light-gray weathering, finely crystalline dolomite in thin to medium-bedded ledges, lies above the Aleman Dolomite of the Montoya.

Above the Valmont is the Fusselman Dolo-

mite (Silurian), approximately 85 ft thick, with sugary texture, and forming a resistant cliffy ledge of brownish-gray, finely crystalline dolomite with abundant chert layers and nodules. This rock unit underlies the distinctive shelf of Dog Canyon; it is the upper unit of the shelf that is about 500 ft above the Visitor Center, along the ridge trail.

The Oñate Formation (Devonian) lies unconformably above the Fusselman and is 60 ft of brownish dolomitic siltstone; it weathers to a low slope above the Fusselman. In the upper part of the Oñate, or in the lower part of the

### References

- Pray, Lloyd C., 1961, Geology of the Sacramento Mountains escarpment, Otero County, New Mexico: New Mexico Bureau Mines and Mineral Resources, Bull. 35, 144 p.
- Rhodes, Eugene M., 1913, Bransford of Rainbow Range: Boston and New York, Houghton Mifflin Co.
- Wimberly, Mark, Eidenbach, Peter, and Betancourt, Julio, 1979, Cañon del Perro, a history of Dog Canyon: Human Systems Research, Inc., Tularosa, New Mexico, 261 p. (copies also available at New Mexico Bureau Mines and Mineral Resources and at New Mexico State Parks & Recreation Division) □

—Frank Kottowski, 1981

## Geographic names

U.S. Board on Geographic Names

**Gallo Peak**—peak, elevation 3,049 m (10,003 ft) in the Manzano Mountains 4 km (2.5 mi) south of Osha Peak 8.9 km (5.5 mi) west of Manzano; in Torrance County, New Mexico; 34°38'13" N., 106°26'18" W.; *not*: Osha Peak.

**Osha Peak**—peak, elevation 2,839 m (9,131 ft) in the Manzano Mountains 4 km (2.5 mi) north of Gallo Peak, 8.9 km (5.5 mi) west of Manzano; in Torrance County, New Mexico; 34°40'10" N., 106°25'45" W.; *not*: Gallo Peak.

**Hardscrabble Spring**—spring, in the San Mateo Mountains, 0.97 km (0.6 m) east-south-east of Milligan Peak and 64 km (40 mi) north-northwest of Truth or Consequences; in Socorro County, New Mexico; sec. 14, T. 7 S., R. 6 W., New Mexico Principal Meridian; 33°42'13" N., 107°25'43" W.

**Mine Canyon**—canyon, 5.6 km (3.5 mi) long, heads at 36°26'26" N., 106°45'05" W., trends east on the north side of Mesa Golondrina to Chama Canyon 27 km (17 mi) northeast of Gallina; in Rio Arriba County, New Mexico; sec. 26, T. 26 N., R. 2 E., New Mexico Principal Meridian; 36°27'16" N., 106°42'07" W.; *not*: Mine Cañon, Tule Canyon.

**Rabbit Eye Spring**—spring, in the San Mateo Mountains, 1.6 km (1 mi) west of Steel Hill and 50 km (31 mi) north of Truth or Consequences; in Socorro County, New Mexico; secs. 25 and 26, T. 8 S., R. 5 W., New Mexico Principal Meridian; 33°35'24" N., 107°18'53" W.; *not*: Rabbit Spring

by Stephen J. Frost,  
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