
Association Round Table

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Abstracts of Papers

AIKEN, CARLOS, and DAVID GARVEY, Univ. Texas, Dallas, MAURICIO DE LA FUENTE, Consejo De Recursos Minerales, Mexico City, et al.

Geophysical Studies of Chihuahua City Region, Mexico

No abstract available.

BARROWS, L. J., Sandia Laboratories, Albuquerque, NM

Geophysical Studies of Evaporites in Northern Delaware Basin, Texas

Geophysics has been an integral part of the Waste Isolation Pilot Plant since its inception. Previous activities have included electrical resistivity surveys, review of petroleum exploration seismic lines, purchase of aeromagnetic and gravity surveys, installation of an earthquake seismometer, a seismic refraction survey, and five seismic reflection surveys. Ongoing or planned activities include installation of a multistation seismometer array, subsurface radar, vertical-gradient aeromagnetics, and high-resolution seismic work.

The seismic reflection and gravity data indicate complex structure in the northern part of the site. The seismic lines show a deterioration in reflector quality, character, and continuity within this disturbed zone. Events within the Castile Formation have a blocky nature with abrupt offsets and angular discontinuities between blocks. The lower members of the Castile Formation are thinner than normal. Both the underlying Delaware Mountain Group and overlying Salado Formation are less deformed than the Castile. Well control is consistent with the seismic interpretation. An interesting feature is an "expandable scale" contraction of the lower Salado in two wells in which individual beds are present but have been reduced 10 to 50% in thickness.

BOCKOVEN, NEIL T., Exxon Minerals Co., Albuquerque, NM

Geology of Sierra del Gallego Area: Comparison with Pena Blanca Uranium District, Mexico

A 1,000-m section of volcanic rocks overlying Lower Cretaceous limestone in the Sierra del Gallego area 200 km south of El Paso can be divided into four lithologic sequences. About 44 to 38 m.y. ago, at least five separate crystal-poor sanidine-bearing outflow units of rhyolitic tuff covered parts of the area. The tuffaceous activity was closely followed by lava flows of fritted feldspar-bearing tholeiitic andesite. These

flows were followed about 37-35 m.y. ago by a sequence of rhyolite flows, flow domes, and intrusions. A 6-m.y. period of quiescence was followed about 29 m.y. ago by massive outpourings of basalt with minor associated rhyolite tuff. Parts of the oldest sequence are probably correlative with stratigraphic units in the Pena Blanca area in New Mexico. The Pozos limestone conglomerate at the deposit has a counterpart in the Sierra del Gallego area. Petrographic similarities, thickness relations, geodes, and K-Ar dating directly link the H member in the lower part of the Liebres Formation in the Sierra del Gallego area with the Nopal Formation at Pena Blanca. The Pozos, Nopal, Escuadra, Pena Blanca, and Mesa Formations are, as a group, lithologically and chronologically similar to the oldest sequence (the Liebres Formation) of the Sierra del Gallego area.

BORNHORST, THEODORE J., WOLFGANG E. ELSTON, and RICHARD S. DELLA VALLE, Univ. New Mexico, Albuquerque, NM, et al

Distribution of Uranium in Middle Tertiary Volcanic Rocks, Mogollon-Datil Volcanic Field, New Mexico

The uranium abundances in middle Tertiary volcanic rocks of the Mogollon-Datil volcanic field, southwestern New Mexico, have been determined as part of a major petrogenetic study. Over 350 samples of middle Tertiary to Quaternary volcanic rocks have been analyzed for their uranium content by delayed neutron activation analysis.

Of the volcanic associations previously proposed for southwestern New Mexico, calc-alkalic andesite, ± 43 to ± 35 m.y., has a mean of 2.3 ppm U (range 0.9 to 5.4 ppm); calc-alkalic quartz latite to rhyolite, ± 35 to ± 29 m.y., has a mean of 3.9 ppm U (range 1.7 to 6.2 ppm); basaltic andesite and associated rocks, ± 32 to ± 18 m.y., has a mean of 2.3 ppm U (range 0.8 to 6.9 ppm); and high-silica rhyolite, ± 32 to ± 18 m.y., has a mean of 5.2 ppm U (range 1.6 to 9.4 ppm). Anomalous values in the range of 14 to 35 ppm U were found for a riebeckite-bearing lava from the central San Mateo Mountains, a sample of intrusive andesite from the Alum Mountain area, and a lithophysal rhyolite lava and associated ash-flow tuff from the Sierra Cuchillo. Post-13-m.y. bimodal basalt-rhyolite is sparse within the Mogollon-Datil volcanic field. A few determinations from this study, and published and unpublished data for other localities in New Mexico, indicate U abundance from 0.3 to 1.5 ppm U in post-13-m.y. basalt and about 7 to 8 ppm U in rhyolite.

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Model for Formation of Uranium/Lithophile Element Deposits in Fluorine-Enriched Volcanic Rocks

Many uranium and other lithophile element deposits are