chanoid dune deposition. Facies C is characterized by tabular-planar cross-beds, 3 to 4 m thick, interlayered with flat laminated fluvial arenites. It probably formed by migration of solitary transverse dunes across emergent parts of the braidplain. Paleocurrents in all facies are unimodal and parallel to the paleoslope, but commonly show a strong mode perpendicular to the paleoslope. The lack of duricrusts, silcretes, and ephemeral lake deposits suggests a semi-arid to humid paleoclimate.

The eolianites are distinguished from fluvial sediments by: (1) tabular-planar and trough cross-beds bounded by low-angle to horizontal planar surfaces, the cross-beds being composed internally of wedge-shaped intrasets that dip in the direction of the megaset foresets; (2) ripple cross-lamination perpendicular to the megaset foreset dip; and (3) large-scale cross-beds. An eolian origin is substantiated by association with braided river facies, dissimilarity of cross stratification compared to established fluvial facies models, and the tectonic setting.

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Reflection Seismic Surveys for Basin and Range Geothermal Areas—An Assessment

Several state-of-the-art reflection seismic surveys have been completed in high-temperature geothermal areas of the northern Basin and Range province. The survey data have been made public through the Department of Energy/Division of Geothermal Energy Industry Coupled and Exploration Technology programs. Data were studied for the Stillwater, Dixie Valley, Beowawe, San Emidio, and Soda Lake resource areas.

Reflection quality, and hence usefulness of the reflection method, can be highly variable in the complex basin and range environment. Certainly survey design and proper processing are required to enhance the quality of the data. The most severe geologic condition appears to be the presence of surface, or near surface, layered volcanic rocks. These result in strong early reflections, substantial ringing and poor energy penetration to depth, as at Beowawe. In areas of thick alluvial cover, or Tertiary gravels and lake bed sedimentation (San Emidio, Soda Lake, Stillwater), data quality is often sufficient to map basin border faults and major displacements on volcanic or bedrock surfaces beneath 2,000 to 4,000 ft (609 to 1,219 m) of cover. Faulting is indicated primarily by the systematic termination of coherent reflections. Diffraction patterns are sometimes recognized but commonly obscured by the complex faulting and lithologic variations. The identification of a given reflector across major structures and accurate time-to-depth conversion are difficult interpretational problems. Excellent data quality at Stillwater and Dixie Valley should contribute to the development of these resources.

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Roosevelt Hot Springs, Utah Geothermal Resource —Integrated Case Study

The Roosevelt Hot Springs geothermal resource is located along the western margin of the Mineral Mountains, approximately 19 km northeast of Milford, in southwestern Utah. To date, seven producing wells have been drilled by Phillips Petroleum Co. and Thermal Power Co. Construction will soon begin on the first stage of a 120-megawatt power plant.

Detailed geologic mapping and the study of well logs and drill cuttings indicate that the geothermal reservoir is a fracture-controlled, liquid-dominated system. The host rocks of the reservoir are Precambrian metamorphic rocks and various Tertiary intrusives. The reservoir is mainly localized between the range front and an alluvial covered horst block, along which fluids have migrated to the surface forming an elongate north-trending dome of siliceous sinter. The reservoir is an area of high heat flow (over 1,000 mW/sq mi) and low near-surface electrical resistivity (less than 10 ohm-m). Aeromagnetic, gravity, and reflection seismic data help define the geologic structure within and around the alluvium covered reservoir. Trace element geochemistry shows that arsenic, lithium, and mercury are enriched along fluid pathways of the geothermal system. Mercury concentrations greater than 20 ppb occur only at temperatures less than 225°C and reflect the present thermal configuration of the field.

The system was efficiently explored using detailed geologic mapping in combination with thermal gradient studies and dipole-dipole resistivity.

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Biostratigraphy of Monterey Formation, Palos Verde Hills, Southern California

Three members comprise the Monterey Formation in the Palos Verdes Hills: the Altamira Shale, The Valmonte Diatomite, and the Malaga Mudstone. Following the diatom zonation of Barron (in press), the middle to upper Altamira Shale ranges from Subzone b of the *Denticulopsis lauta* Zone through Subzone b of the *Denticulopsis hustedtii-D. lauta* Zone (14.5 to 12 m.y.B.P.), the Valmonte Diatomite ranges from Subzone b of the *D. hustedtii-D. lauta* Zone into the lower *Thalassiosira antiqua* Zone (13 to 8 m.y.B.P.), and the Malaga Mudstone ranges from the lower *T. antiqua* Zone into the lower *Thalassiosira oestrupii* Zone (8 to 4 m.y.B.P.), transgressing the Miocene-Pliocene boundary (5 m.y.B.P.). The overlap of up to one million years along the Altamira-Valmonte contact is not surprising since this contact is characterized by a diagenetic change of Opal-A to Opal-CT at most sites.

The age distribution of outcrops reflects northwest-southeast-trending anticlinorium structure of the Palos Verdes Hills, but local sections are discontinuous and deformed due to slumping, folding, and faulting during Pliocene uplift of the hills. This is best seen at Malaga Cove where folds, faults, and slumps are visible along the sea cliffs, and a short hiatus marks the Valmonte-Malaga contact.

The siliceous biostratigraphy of the Palos Verdes Hills correlates to that of the Monterey Formation at Newport Bay. However, the correlation of the siliceous zonation to the benthic foraminiferal stages (assigned by Woodring et al, and Warren) differs for the two areas.

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Dune Size in Paleodeserts of Colorado Plateau

Where dunes migrate during deposition, they move upward (climb) with respect to the generalized depositional surface. Sediment deposited on each lee slope and not eroded during passage of a following trough is left behind as a cross-stratified