

POTENTIAL FOR "ENHANCED GEOTHERMAL SYSTEMS" IN THE WESTERN UNITED STATES

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ABSTRACT

Most presently active or contemplated hot dry rock (HDR) projects vary significantly from the original HDR concept of creating an engineered reservoir in an effectively impermeable medium. Instead, they form part of a spectrum of geothermal resources that exhibit less-than-commercial productivity, but are not completely impermeable. A new working definition, "Enhanced Geothermal Systems" (EGS), is now being used to describe all but the high-grade hydrothermal portion of the geothermal resource spectrum. To promote the commercial development of these lower permeability and/or fluid-deficient resources, EGS research and development in the U.S. during the next few years is likely to include field experiments that target hot, low permeability zones within or near the margins of commercially developed hydrothermal systems. These systems are located in areas of elevated regional heat flow (Cascade Range, Basin and Range Province, Salton Trough, California Coast Ranges and Rio Grande Rift Zone), where temperatures of 250°C can be reached at depths of 4 km or less. Potential sites for EGS experiments were identified with the objective of yielding immediate benefits to the geothermal industry while also contributing to the commercial development of an incrementally broader range of geothermal resources. On the basis of certain resource, infrastructure and social criteria, The Geysers, Salton Sea, Coso, Dixie Valley, Soda Lake, Steamboat and Roosevelt were identified as the most promising locations for increasing heat recovery by reservoir enhancement. Sites of secondary interest are Heber, East Mesa, Newberry, Medicine Lake, Puna and Cove Fort. These existing systems represent only a small fraction of the U.S. geothermal resource base but provide a unique opportunity to further the development of EGS.

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