

## **Assessment of Potential Geothermal Energy Development in the Tomichi Dome Area, Colorado**

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In response to geothermal lease nominations on the Grand Mesa-Uncompahgre-Gunnison National Forest, the U.S.D.A. Forest Service requested that the Bureau of Land Management assess the potential for future geothermal development in the area of the lease nominations.

The lease nominations are located in an intra-mountain geothermal system approximately 20 miles east of Gunnison, Colorado. The system includes approximately 38,628 surface acres of land surrounding Tomichi Dome and Waunita Hot Springs. While utilized for its surface thermal waters since the 1840's, very little information exists regarding the nature of the geothermal system at depth.

A detailed analysis of geologic maps, historical publications, and personal interviews has yielded a better understanding of the area's geothermal system and its potential for geothermal resource development, specifically for electrical generation through binary exchange. The probable geothermal reservoir is the Cretaceous Dakota Sandstone. The geothermal system is bounded to the east, north, and west by fault-related contacts with Proterozoic crystalline rocks, and to the south by Tomichi Creek. The Dakota is confined by the overlying Mancos Shale and the underlying shales of the Morrison Formation. Recharge principally occurs in the northwestern portion of the area where the Dakota is exposed at the surface.

Temperature gradients from shallow (<330 ft) boreholes (1970's vintage) suggest that the geothermal system is of sufficient temperature at shallow enough depths (<8,000 ft) to support a binary-type geothermal power plant. Local faulting would provide the necessary conduits for recirculation of utilized geothermal waters. The area is near a major highway, and an electrical transmission corridor runs through the northern portion of the nominated lands.

It is our determination that there is a high potential for development of the geothermal resource specifically for electrical generation through a binary exchange power plant in the Study Area. If lands in the area are leased, development will most likely occur south of Hot Springs Creek, and north of U.S. Highway 50. Development will begin with data collection efforts (exploration) aimed at refining the geologic picture (e.g., fault orientation and location, deeper geothermal gradient determinations, etc.), followed by concept testing through drilling of test wells, and culminate with the locating and construction of a binary power plant, drilling of production and injection wells (up to five total), and construction of associated infrastructure (pipelines, transmission lines, roads, etc.).