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The Potential for Geothermal Energy Recovery from Enhanced Geothermal Systems in the Raton Basin of Southern Colorado, USA

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The Raton Basin of southern Colorado and northeastern New Mexico overlies a geothermal anomaly with temperature gradients of greater than 3°F/100' and projected temperatures of 300°F at 8000' depth over an area of more than 350 square miles. The anomaly presents an opportunity to capture heat from sedimentary rock using conventional drilling and stimulation practices which if successful could be widely applied in other hot sedimentary basins.

The basin is particularly suited for an Enhanced Geothermal Systems (EGS) project as it has dense well control, extensive infrastructure and ample water from coalbed methane production. It is primarily fee land and minerals which can streamline access to resources. The anomaly is close to the city of Trinidad, to electric infrastructure, and to local and regional energy markets.

The target reservoirs are the Permian and Pennsylvanian Sangre de Cristo and Madera formations (local equivalents to the Fountain Formation of central Colorado, famously outcropping at Red Rocks amphitheater). The rock consists of interbedded sands, silts and shales typically deposited in an alluvial setting close to the Ancestral Rocky Mountains. This assemblage provides a sequence of brittle and more ductile units which could contain and focus hydraulic fractures to produce near-closed fluid circulation for EGS. Drillstem test information indicates that the basin is under-pressured which may make it important to achieve a closed system for water management and circulation efficiency.

Studies are ongoing to ascertain the thermal properties of the reservoir rock, its mechanical and geochemical properties, and the potential for induced seismicity from EGS operations. Results from these and from thermal, fracture, and economic modeling will be presented.