

GEOLOGIC SETTING OF THE RAFT RIVER GEOTHERMAL AREA, IDAHO

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The Raft River Known Geothermal Resource Area (KGRA) in southernmost central Idaho lies in the southern Raft River Valley, a late Cenozoic structural downwarp bounded by faults on the W, S and E. The S end of the valley is defined by the east-trending Raft River Range; 55 km to the N the valley opens onto the Snake River Plain. The valley is underlain by (1) 5-70 m of Pleistocene and Holocene fan gravel and alluvium; (2) the Pleistocene Raft Formation, 0-200 m of silt and sand; and (3) the Pliocene Salt Lake Formation, up to 1,800 m thick, consisting of (a) lower tuffaceous sediments, (b) middle volcanics--felsic lava flows, and ash flows--and (c) upper basin-fill tuffaceous sediments and conglomerate. Shallow, nearly contemporaneous felsic plugs intrude the Salt Lake Formation. The Tertiary rocks rest on structurally complex Paleozoic and Precambrian rocks.

Warm water is pumped from wells in several parts of the valley, but the most promising thermal anomaly is around two wells near Bridge that flow boiling water. This anomaly is at the intersection of two major structures: a NNE-trending normal fault set, down to the E, with movement probably as recent as late Pleistocene, and an ENE structural discontinuity, probably a right-lateral fault, that separates different styles of deformation at the S end of the Jim Sage Mountains W of the valley and that is one of several major lineaments on space photographs.

Geologic and geophysical data suggest deep circulation and heating of ground water and upwelling of hot water along faults. The moderate geothermal gradients common in the Basin and Range province or along the margins of the Snake River Plain are sufficient to represent the heat source.