

Silica concentration ranges between 50 and 72 ppm, indicating subsurface temperatures between 98° and 118°C. Subsurface temperatures indicated by the Na/K atomic ratios range from 65° to 115°C. Reservoir temperatures indicated by the Na-K-Ca thermometer are highest of all, ranging from 80° to 270°C. The Na-K-Ca temperature for sample X74533 is unrealistically high because of the large calcium concentration it contains. There seems to be good agreement between silica, Na/K and in three cases Na-K-Ca geothermometers. The temperatures listed in Table 1 are in good agreement with a well drilled on the Young Life property just south of Hortense Hot Spring where a temperature of 158°C and flashing in the bore hole were observed at 172 feet.

The high Na/Mg and Mg/Ca atomic ratios (sample X74533 has a low Na/Ca ratio) qualitatively indicate high subsurface temperatures. The low Cl/F atomic ratios may indicate the presence of a vapor phase, however, this relationship is not empirically founded.

Low magnesium and calcium concentrations are found in all samples except X74533 and qualitatively indicate high subsurface temperatures because these elements exhibit low solubility at high temperatures and vice versa.

Discussion

The thermal waters of the Mt. Princeton area exhibit characteristics of both hot water and vapor dominated systems. The writer feels that these waters contain a portion of condensate from an underlying wet or dry steam reservoir which issues up through faults in a capping horizon. The remainder of the thermal waters belong to a ground water system that exists above the capping horizon and is heated by the conducting capping horizon.

Frank Dellechaie

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REFERENCES

Sharp, W.N., 1970, Extensive zeolization associated with hot springs in Central Colorado: U.S.G.S. Professional Paper 700-B, p. B14-B20.