

Effect of Natural Recharge Temperature on Reservoir Pressure

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The reservoir temperature as well as the reservoir pressure is a vital phenomenon in understanding the behaviors of geothermal systems. There are many factors influencing the pressure performance of geothermal systems such as reservoir volume, temperatures (average reservoir temperature, natural recharge temperature and re-injection temperature) and productions (production rate, re-injection rate and natural recharge rate).

The aim of this study is to estimate the natural recharge temperature by using pressure-time data. Various synthetic examples are generated to examine the effects of natural recharge temperature on the performance of reservoir pressure. A non-isothermal lumped parameter (tank) modeling based on mass and energy conservation is used in the synthetic examples. In the given examples geothermal system is either represented by a single tank or multiple tanks.

The examination of the effects of natural recharge temperature on reservoir pressure is considered for three cases; (a) the temperature of recharge constant is lower than reservoir temperature, (b) both the temperature of recharge constant and reservoir are equal to each other and (c) the temperature of recharge constant is higher than the reservoir temperature.