

(ii) Method of Estimation of Present Geothermal Gradient

Lopatin Time Temperature Maturation Plots (LTTMP) require input of the best available data on the present temperature gradient. SAOGC uses a new method for estimating static formation temperature from bore hole temperature data and since maturation history depends strongly on temperature history, it was important to thoroughly reappraise the temperature data.

Several methods of estimating the true static formation temperature from time sequentially collected bore hole temperature measurements are available. The most common method is the Horner plot which requires knowledge of the time spent circulating the bore hole fluids prior to running the temperature logs. This method was used by Nicholas and others (1981 p. 208). Unfortunately the raw data required to accurately use this method is rarely considered worthy of systematic or reliable operational procedures, since temperature measurement is secondary to the prime aim of well logging. In the Bass Basin, temperature data is invariably incomplete or inconsistently reported, so only a small percentage of the available data can be used. In particular, knowledge of the time spent circulating prior to logging is difficult to ascertain from either the log headers or from the well completion reports available to SAOGC.

To partly overcome this problem, SAOGC has used the method described by Middleton (1979) and modified by Leblanc and others (1982). This method has the advantage that the circulation time prior to logging need not be known.