A straight line joining the plotted points is extrapolated to the temperature axis and true bottom hole static temperature is read off (figure 2). The method fails if circulation and the addition of new, cool mud into the system occurs between log runs.

Nwachukwu (1976) proposed a mathematical method, utilizing a modified Lachenbruch-Brewer (1959) equation, to calculate true static bottom hole temperature when three bottom hole temperatures are available from logging runs (figure 3). True bottom hole temperature, T_f, is solved by:

$$T_f \frac{(t_2 - t_1) + ((T_1 \cdot t_1) - (T_2 \cdot t_2))}{T_2 - T_1} = T_f \frac{(t_3 - t_1) + ((T_1 \cdot t_1) - (T_3 \cdot t_3))}{T_3 - T_1}$$

where T_1 = recorded BHT, log run 1
T_2 = recorded BHT, log run 2
T_3 = recorded BHT, log run 3
t_1 = time since circulation stopped, log run 1
t_2 = time since circulation stopped, log run 2
t_3 = time since circulation stopped, log run 3
T_f = true static formation temperature

(b) Mud Resistivity/Conductivity

Dissolved solids in formation water are often correlated to the total chloride concentration of salinity. When conductivity is monitored at the flowline and the mud pits, a conversion is made to chlorides, and the differential, $\triangle$ Cl, is purportedly an indicator of geopressure. The dissolved solid contents of water in normally pressured shale is known to increase with depth, but shows a decrease in geopressured shale. The trend is similar in normally pressured sands but at a higher concentration than shale waters, while in geopressured sands the dissolved solid concentration of sands pure water approaches that of shale water. Therefore geopressured zones may be detected in the resistivity changes of returning mud, but this will be influenced by the shale/sand ratio of the basin. Moreover, the