

**R<sub>weq</sub>** Determination from E<sub>SSP</sub>

Clean formations

SP-1

This chart and nomograph calculate the equivalent formation water resistivity,  $R_{weq}$ , from the static spontaneous potential,  $E_{SSP}$ , measurement in clean formations.

Enter the nomograph with  $E_{SSP}$  in mV, turning through the reservoir temperature in °F or °C to define the  $R_{mfeq}/R_{weq}$  ratio. From this value, pass through the  $R_{mfeq}$  value to define  $R_{weq}$ .

For predominantly NaCl muds, determine  $R_{mfeq}$  as follows:

- If  $R_{mf}$  at 75°F (24°C) is greater than 0.1 ohm-m, correct  $R_{mf}$  to formation temperature using Chart Gen-9, and use  $R_{mfeq} = 0.85 R_{mf}$ .
- If  $R_{mf}$  at 75°F (24°C) is less than 0.1 ohm-m, use Chart SP-2 to derive a value of  $R_{mfeq}$  at formation temperature.

**Example:**  $SSP = 100 \text{ mV at } 250^\circ\text{F}$   
 $R_{mf} = 0.70 \text{ ohm-m at } 100^\circ\text{F}$   
or  $0.33 \text{ ohm-m at } 250^\circ\text{F}$

$$\begin{aligned} \text{Therefore, } R_{mfeq} &= 0.85 \times 0.33 \\ &= 0.28 \text{ ohm-m at } 250^\circ\text{F} \\ R_{weq} &= 0.025 \text{ ohm-m at } 250^\circ\text{F} \\ E_{SSP} &= -K_C \log(R_{mfeq}/R_{weq}) \\ K_C &= 61 + 0.133 T_{^\circ\text{F}} \\ K_C &= 65 + 0.24 T_{^\circ\text{C}} \end{aligned}$$

