GL07319 (IBM min) 26 MAY 1978

ESTIMATE DISTANCE TO #1 BOUNDARIES - RULE 2

DATA ← NARI & WITHERSPOON

ANALYALTIC TECHNIQUES BY MERRILL, KAZEMI & GOGARTY "PRESSURE FALLOFF ANALYSIS IN RESERVOIRS WITH FLUID BANKS" JOUR PETRO TECH JULY 1974

$$r_{f1} = \sqrt{\frac{0.0002637\ k\ \Delta t_{f1}^{*}}{\phi\ \mu\ c_t\ \Delta t_{Df1}^{*}}}$$

r_{f1} - DISTANCE 1ST BOUNDARY (ft)

k = HYDRAULIC CONDUCTIVITY (md)

$\Delta t_{Df1}^{*} = t_D$ BREAKPT ~~(TIME OF BREAK FROM JACOB ST LINE)~~

ϕ = POROSITY

μ = VISCOSITY cp

c_t = COMPRESSIBILITY $psia^{-1}$

Δt_{f1}^{*} = time HRS OF DEVIATION FROM ST LINE

$$k = \frac{kh}{h} = \frac{47000\ md\text{-}ft}{2300\ ft} = 20.4\ md$$

2 UNCASED WELL BORE

$$\Delta t_{Df1}^{*} = \frac{0.0002637\ k\ \Delta t}{(\phi c_t)\ r_{f1}^2}\ ?$$

TAKE t_D OFF THIS → $t_D = 10$

RULE 2 BOUNDARY ANALYSIS

IF $h = 500$ FT

$$k = \frac{kh}{h} = \frac{47000 \text{ md-ft}}{500 \text{ ft}} = 94 \text{ md}$$

$$t_D = 10$$

$$\phi c = \frac{\phi c h}{h} = \frac{1.19 \times 10^{-3} \text{ ft/psi}}{500 \text{ ft}} = 2.38 \times 10^{-6} \text{ ft/psi/ft}$$

$$\mu = 0.18$$

$$\Delta t = 0.25 \text{ HRS}$$

$$r = \sqrt{\frac{(0.0002637)(94 \text{ md})(0.25 \text{ HRS})}{(2.38 \times 10^{-6} \text{ ft/psi/psi})(0.18)(10)}}$$

$r = 38 \neq$ (40)

PROJECT 2 BOUNDARY ANALYSIS

$\phi c = \frac{\phi ch}{h}$ ← INTERFERENCE TEST DATA FROM #1

$\phi c = \frac{1.19 \times 10^{-3} \text{ ft/psi}}{2300 \text{ ft}} = 5.2 \times 10^{-7} \text{ ft/psi/ft}$

$\mu = 0.18$ cp

$\Delta t_{pl} = 15$ MIN $= 0.25$ HRS

$$r = \sqrt{\frac{(0.0002637)(20.4 \text{ md})(0.25 \text{ HRS})}{(5.2 \times 10^{-7} \text{ ft/psi/ft})(0.18 \text{ cp})(10)}}$$

$r = 38.6 \text{ ft} \approx 40 \text{ ft}$

BOUNDARY ANALYSIS RRU I 2

$$r = \sqrt{\frac{0.0002637 \lambda \Delta t_{DFX}}{(\phi C)(\Delta t_{DFX})}}$$

$$\lambda = \frac{k}{\mu} = \frac{94 md}{0.18 cp} = 522 \ md/cp$$

$\Delta t_{DFX} = 0.25$ HRS

$\phi C = 2.38 \times 10^{-6}$ ft/psi/ft

$t_D = 10$

$$r = \sqrt{\frac{0.0002637 \ (522 \ \frac{md}{cp}) (.25 \text{ HRS})}{(2.38 \times 10^{-6} \text{ ft/psi/ft})(10)}}$$

$r = 38.7 =$ 40 ft