

Judson AUU State #2 -- Drainage Area

1. Original Oil in Place (stock-tank barrels) is given by the equation

$$\text{OOIP} = 7758 * A * h * \phi * S_o / B_o i$$

where $h * \phi * S_o$ is the hydrocarbon pore volume.

2. The log calculations for hydrocarbon pore volume yield $h * \phi * S_o = 0.293$.

3. $B_o i = 1.47$ from the Standing Correlations where the parameters are as follows:

Solution GOR	=	875
Temperature	=	160 degrees F
Gas Gravity	=	0.7
Tank Oil Gravity	=	39 degrees API

4. Ultimate Primary Recovery (N_p) = Recovery Factor * OOIP

where Recovery Factor (R_f) = 0.22

from 1957 paper entitled
"Estimation of Ultimate Recovery from Solution Gas-Drive Reservoirs" by
Wahl, Mullins and Elfrink of Magnolia Petroleum.

5. Then, $N_p = R_f * 7758 * A * h * \phi * S_o / B_o i$

and, by rearranging, $A = N_p * B_o i / (R_f * 7758 * h * \phi * S_o)$ in acres

$$A = 51301 * 1.47 / (0.22 * 7758 * 0.293) \text{ in acres}$$

$$A = 151 \text{ acres is the Drainage Area}$$