Vertical segregation of an oil reservoir

Water cut (proportion of produced fluid that is water)

0% 100%

“Clean oil” zone: 100% oil produced

Oil column

Economic oil-water contact

Transition zone

100% water production (oil-water contact)

100% water produced

100% water level

Irreducible (immobile) water (because rock is water-wet)

Mobile water

Producible oil

Immobil (residual) oil

Water saturation

The oil-water contact as defined by oil production is above the base of the oil column.

Before production

Immobile (surface-bound) water

After production

Immobil (stranded) oil

Grains in sedimentary rock

Mobile oil

Mobile water

Immobile oil

Mobile water

Sources:
Figure 29 of Shepherd (2009), which is from Jennings (1987) and Figure 5.16 of Giayas & Swarbrick (2004), which is from Archer and Wall’s (1986) Petroleum Engineering.