

ROZ Potential of Tensleep Reservoirs, Bighorn Basin

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The residual oil zone (ROZ) is the reservoir interval below the oil-water contact, and is typically not perforated for primary and secondary production. ROZs have been successfully identified and produced in the Permian Basin based on screening criteria including tectonic movements, hydrocarbon migration and accumulation, oil composition, and reservoir properties. Tensleep reservoirs in the Bighorn Basin have potential to contain thick ROZs based on evaluation of these same screening criteria. During the primary and secondary production period, most of the oil in the residual oil zone is not touched. After intensive water flooding, the oil saturation in the main pay zone (MPZ) of Tensleep reservoirs is reduced to that in the ROZ. CO₂-EOR is a promising technique for recovering the remaining oil from these mature reservoirs. The EOR potential in Tensleep reservoirs will significantly increase by adding the ROZ reserves to the remaining potential in the MPZ. If the ROZ potential can be proved in the Bighorn Basin Tensleep reservoirs as predicted, rich ROZ potential could also exist in Tensleep reservoirs in other basins and possibly other productive horizons as well.