



Classification of mechanical heterogeneity of petroleum reservoir rocks optimal for radial drilling technology

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The radial drilling technology involves drilling lateral horizontal boreholes of small diameter and up to one hundred meters long with the possibility of placing several wells within productive petroleum reservoirs. The usage of the radial drilling involves making small diameter horizontal perforations in the rock formation by using water jet and the jet propulsion which facilitate the penetration along the rock formation. In this study was reviewed the effectiveness of water jet propulsion for different mechanical heterogeneity of rocks. Experiments were carried out to investigate the variation in water jet penetration in different rock types, such as sandstones, carbonates, conglomerates, dolomites, limestone, etc., and their mechanical variations including unconsolidated and cemented members. There were also addressed cases when the pores of the rocks were filled with different minerals including clays and quartz. It was found that the method of penetration differ for mechanical heterogeneity of rocks. The results are shown for the different types of rocks and degree of their porosity variations. The efficiency of the rock penetration obtained by dividing the energy of the jet by the volume of hole created is discussed in relation to rock types and the method of rock failure.