MICROFACIES ANALYSIS AND DIAGENETIC STUDIES OF EARLY EOCENE MARGALA HILL LIMESTONE, IMPLICATIONS FOR THE RESERVOIR CHARACTERIZATIONS, SOUTH EASTERN HAZARA, KP, PAKISTAN.

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ABSTRACT

This research was carried out for the determination of depositional environment, diagenesis and reservoir characterization of the Margala Hill Limestone in South Eastern Hazara. The formation consists of grey color limestone, medium to thick bedded, nodular and fractured. On the basis of petrographic studies and allochems to matrix ratio, six microfacies were identified in the Formation in the study area. These microfacies includes; larger benthic foraminiferal bioclastic packestone (MF-1), bioclastic Assilina packestone (MF-2), bioclastic Nummulitic packestone (MF-3), bioclastic larger benthic foraminiferal wackestone (MF-4), larger benthic foraminiferal wackestone (MF-5) and assilina wackestone (MF-6). These microfacies indicate that Margala Hill Limestone was deposited in distal inner to proximal middle to distal middle ramp setting. The processes of biogenic alteration, neomorphism, compaction, dolomitization, fractures, dissolution and nodularity are the manifestation of diagenetic processes occurring in the Formation. These processes indicate that Margala Hill Limestone had experienced marine, meteoric and burial diagenesis. The different porosity types on the basis of petrography includes intragranular, intergranular, moldic, vuggy and fractured porosity. The fractures are the dominant features (identified on the macroscopic and microscopic scale) that increase the porosity and permeability of the Formation. The SEM Studies show the dissolution has affected most of the Formation which is important for the enhancement of poroperm (porosity and permeability) values and migration of hydrocarbon. The diagenetic studies represent that Margala Hill Limestone were affected by diagenesis. The reservoir studies of the Margala Hill Limestone show a good secondary reservoir for the hydrocarbon accumulation.