The source rock at Simpson- Ellenburger system is a sedimentary type of rock. As per the geochemical data, the Ordocivian source rock was limited to shales in the Simpson group. It was expelled for an approximated period of 210-m.y. period as shown by thermal and Urial reconstructions. According to Katz , Robison, Dawson & Elrod, (1994) the petroleum system's reservoir rock occurs within the karstified Ellenburger dolomites. The source rock, primary reservoir rock, and seal rock were deposited in a period of 52-m.y.While the important overburden rock required for generation of hydrocarbon plus migration took a period of 418-m.y.and ended during Oligocene (~35 Ma).(Katz et al, 1994)

There are 7 dolomite-rock textures that are recognized. According to Amthora, & Friedman (2006) they are classified according to crystal-size, their distribution and crystal-boundary shape; To start with, there is the Unimodal and polymodal planar-s mosaic dolomite being most widespread, it replaced allochems and matrix by occurring as void-filling cement. Planar-e dolomite crystals contain pore spaces forming mosaics of medium crystals which relates to intercrystalline porosity. Non-planar-a dolomite took the place of a precursor limestone in zones that are characterized by high porosity and permeability. The latest is the non-planar dolomite which performs the occlusion of fractures as well as pore space. (Amthora, & Friedman 2006)

Dolomitization brings about secondary porosity; pre-and post-dates dissolution and corrosion. The widespread porosity types are the non-fabric selective moldic, the vuggy porosity and the intercrystalline porosity. The porous zones have characteristics of late-diagenetic coarse-crystalline dolomite, while the non-porous intervals are composed of dense mosaics of early-diagenetic dolomites (**Kupecz &Land 1991**). The way the dolomite rock textures are distributed acts as proof that there was storage of porous zones as limestone to the diagenetic history, when they were subjected to late-stage dolomitization through deep burial environment, bringing about coarse-crystalline porous dolomites. In addition to the karst horizons that were found on top of Ellenburger Group, the search for Ellenburger Group reservoirs must take into consideration availability of porous zones in other Ellenburger Group dolomites (Amthora & Friedman 2006)

According to Lucia (2007) the spatial distribution of various petrophysical properties is determined by two processes, depositional and diagenetic. Apart from the clarity of the three-dimensional spatial distribution of petrophysical characteristics being determined by spatial distribution of depositional textures, it is clear from many reservoir studies that the petrophysical properties present in carbonate reservoirs are different from the ones found in current carbonate sediment. Diagenesis reduces porosity, redistributes pore spaces, and affects permeability and capillary features. (Lucia, 2007)

About 10% of dolomite in the Ellenburger Group represents the "late-stage". The first group of late-stage dolomite, Dolomite-L1, brings about Dolomite-L2. Despite the replacement they both have similar elements that is; trace element, O, C, plus Sr isotopic signatures, and cathodoluminescence in addition to electron images. The two can be differentiated using chart to study their relationship. Dolomite-L2 is related to the grainstone, subarkose, and siliciclastic facies, mixed with karst breccias. Basing on temperature/delta 18 Owater plots, temperatures of dolomitization was between 60 and 110 degrees C. This is not only caused by burial of the rock but also the presence of hot fluids. Dissolution of basinal fluids brings about the presence of Mg in the late stage Dolomite. **(Kupecz &Land 1991)**

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