

**CARBONATE PORE TYPES OF THE WAHOO FORMATION,  
LISBURNE RESERVOIR, PRUDHOE BAY FIELD, NORTH SLOPE,  
ALASKA**

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The pore system of the Wahoo Formation, Lisburne Group, at Prudhoe Bay Field in Alaska can be classified into seven petrographically defined pore types. These pore types are related to reservoir properties such as porosity, permeability, fluid saturations and capillary pressures. Pore type 0 is a poorly cemented network of sheet or slot-like pores occurring within tightly cemented limestones. Pore type 1 is subdivided into a) microporosity with limestone grains and b) microporosity within limestone matrix. A characteristic of these microporous rocks is their high porosities and low permeabilities. Pore type 2 occurs in limestones and consists of moldic and/or intraparticle macropores that commonly result in high porosity and permeability. Pore type 3 is made up of *intercrystalline pore networks* in dolomite that, depending on pore throat size, can contribute to pay. Pore type 4 is an *intercrystalline pore network* in dolomite that also has at least 10% of the total porosity in the form of molds or vugs. This pore type commonly has the highest porosities and permeabilities in the reservoir and, as indicated by production tests, contributes the majority of the reservoir's flow. Pore type 5 comprises essentially non-effective porosity that is found in shales and discontinuous chert horizons. Lisburne pore types owe their origin to a combination of depositional and diagenetic processes. Early diagenetic dolomitization of mudstones and wackestones created pore types 3 and 4. These dolomite beds acted as fluid conduits for late diagenetic solutions to produce pore types 1 and 2. This geometry of pore types 1 and 2 forming "halos" around pore types 3 and 4, is the basis form defining various flow units with the Lisburne reservoir.