ABSTRACT

TITLE:	Reservoir-Scale Sequence Stratigraphy and Facies Variation Within the Mississippian Leadville Limestone, Southwestern San Juan Mountains, Colorado
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ABSTRACT: Based on observations from seven measured stratigraphic sections and 230 thin sections over 37.3 kilometers, we recognize two sequences that encompass six parasquences and six distinct facies. The facies include bioturbated peloidal packstones, containing ostracods, rare occurrences of planar laminations, plane tabular cross bedding, microbial laminations and fine grain silt and sand. This facies is inferred to have been deposited in a semi-restricted lagoon environment. Interbedded microbial boundstones and finely crystalline dolomitic mudstone facies contain dolomitic microbial laminations, rare stromatolites, rip-up clasts, mudcracks, and soft sediment deformation. This facies was likely deposited in a supratidal setting. The medium grained, well-rounded quartz arenites and sand-rich packstone facies range from 5-40 cm thick and can be traced throughout the study area which may be marginal marine to eolian. There are three variations of grainstones. First, peloidal grainstones containing planar laminations, plane tabular cross bedding, ostracods and discontinuous lenses of black chert and gray chert. This is interpreted to have been deposited in a shallow beach/tidal flat setting. A second variety includes skeletal/peloidal grainstones containing bi-directional current ripples, crinoids and other skeletal fragments. This indicates deposition in an open marine tidal setting. Crinoidal grainstones contain rugose corals, brachiopods, one-meter thick sets of plane tabular cross bedding, and grey chert. This facies was deposited in an open-marine shoal environment. Within this reservoir-scale study, lateral variations of facies thicknesses were larger than then lateral variations of parasequence thicknesses. Grainstone facies thicken towards the northern sections, whereas thicker dolomitic mudstones/microbial boundstones dominate in southern sections. Similar facies variations may occur in the subsurface where total thickness may not vary significantly, but younger, grain-rich facies prograde to fill in depositional lows. When this sequence-scale facies variation is synthesized with the susceptibility of facies to diagenesis and fracturing, reservoir characterization and predictability should be significantly enhanced.