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Depositional Environments and Lithofacies of the Upper Ordovician — Lower Silurian of the Eastern Great Basin, Utah and Nevada

Two east-west transects in western Utah and eastern Nevada preserve Upper Ordovician - Lower Silurian lithofacies along a carbonate ramp transitional between a shelf and basin. The northern transect includes the Lakeside Mountains, northwestern and southeastern Silver Island Range, the Pilot Range and Antelope Peak. The southern transect consists of the northern Egan Range, Lone Mountain and the Monitor and Toquima Ranges.

Depositional environments of the Upper Ordovician-Lower Silurian Fish Haven and Ely Springs dolomites and the Hanson Creek Formation were interpreted by examining stratigraphic sections, thin sections and oriented polished slabs. Lithology, faunal content and stratigraphic relationships were examined.

The Fish Haven Dolomite in the Lakeside Mountains contains the two shallowest lithofacies. Clean, well-bedded, light-colored intertidal dolomites contain stromatolites, cryptalgal laminae, birds-eye structure and rip-up clasts. Shallow-subtidal dolomites are coarser grained and darker than the intertidal deposits. Burrow mottling is pervasive, with one to two cm diameter infaunal burrows, which are dominantly horizontal. Four shallowing-upward cycles, each 10-30 m thick, are the lower half of the formation.

The Ely Springs Dolomite in the Silver Island and northern Egan Ranges has occasional intertidal beds but is dominated by two types of clean, open-shelf dolomites: 1) burrow-mottled wacke/packstone, and 2) well-bedded, current-laminated, non-burrowed encrinite with abraded shells.

In the Pilot Range, the basal part of the formation has graded and nongraded gravity-flow deposits and current-laminated wacke/packstone with oriented bioclasts. The interval is interpreted to have been deposited on the upper slope. Bioclastic wackestone, with occasional thin interbeds of intertidal mudstone, in the upper part of the formation is interpreted to have formed as the depositional environment became shallower than the slope environment.

The Hanson Creek Formation at Antelope Peak in the southern Snake Mountains has bioclastic, lithoclastic wackestone in the basal part of the formation, interpreted to have been deposited on the upper slope. Bioclastic

mud/wackestone in the upper part of the formation is interpreted to have been deposited in a deeper environment than sediments in a similar stratigraphic position to the east.

The Hanson Creek Formation at Lone Mountain has burrow-mottled wacke/packstone and bioclastic pack/grainstone. Intertidal deposits do not occur.

A cream-colored, argillaceous carbonate mudstone interval of regional extent occurs in the Silver Island, Pilot and Egan Ranges, Antelope Peak and Lone Mountain. The interval is interpreted to have been deposited during a widespread transgression.

Quartz-sand-bearing, bioclastic, lithoclastic grainstone occurs at or near the top of the Upper Ordovician-Lower Silurian formations in the Silver Island Range, Antelope Peak, Lone Mountain and the Monitor Range. In the Egan Range, calcispheric grainstone occurs at the top of the formation. The grainstone is interpreted to have been deposited in a shoal environment, with a shallowing at the close of the Upper Ordivician - Lower Silurian depositional cycle caused by glacio-eustatic lowering of sea level.