

Mt. Misery was deposited within a graben structure in the Lower Ordovician period and is transgressively overlain by micaceous siltstones, tubicolular sandstones, grits and minor shales. It is the time equivalent of the Moina Sandstone which was deposited within the Zeehan Basin. The Moina Sandstone is overlain disconformably by the Ordovician Gordon Limestone. The disconformity is occasionally marked by a white quartz conglomerate followed by an interbedded sequence of siltstones, dolomites, and minor sandstone and limestone. The Gordon Limestone is comprised of interbedded limestones and dolomites with numerous breccia horizons and zones of clastic sedimentation including fossiliferous calc-arenites, siltstones and shales. Siluro-Devonian sediments within the basin are fossiliferous marine, coarse grained and cross-bedded quartzose sandstones, siltstone, minor quartzites, and dolomitic to pyritic shales and siltstones.

Extensive Tertiary and Quaternary deposits blanket much of the prospective dolomite and shale units.

The Zeehan area has been intensely disturbed by the Paleozoic Tabberaberan orogeny which caused major north-west folding and faulting. East and north-west trending fault systems are considered to have been contemporaneous. North, northeast striking faults are thought to have developed in post Permian times.