The Mineral Lake Intrusion is a layered mafic intrusion within the Mellen Igneous Complex located in northern Wisconsin. Previous studies collected samples along a 5048m traverse spanning from the base to the top of the intrusion to better understand its mineralogy and chemical composition. These studies reveal an abrupt change in mineral proportions near the middle of the intrusion, suggesting the presence of a magma mixing zone.

The purpose of the current study is to determine the mineral compositional changes within the mixing zone and to determine its lateral extent. To accomplish this rock samples were collected from a new traverse located 3km to the northeast of the original traverse in order to search for the lateral extension of the mixing zone, in addition to gaining a better understanding of the magmatic processes that occurred during crystallization. To determine mineral compositions, specifically the minerals olivine and plagioclase, samples were analyzed using an electron microprobe at the Washington University in St.Louis.

The microprobe data revealed a dramatic change in olivine and plagioclase composition within the mixing zone in the original traverse. The data from the second traverse showed no abrupt changes in mineral chemistry suggesting that the magma mixing horizon is not laterally continuous. Future research would be to extend the study area to the south of the second traverse in order to have two complete profiles across the intrusion.