The Atalissa 7.5' Quadrangle in Muscatine and Cedar counties, Iowa, is located within the Southern Iowa Drift Plain (SIDP) and low-lying flood coasts of the Mississippi River. There are no bedrock exposures in the map area due to burial by Quaternary materials. The SIDP is an area with surface topography defined by loess-mantled uplands and plains, whereas the ICL is a low-relief floodplain consisting of undisturbed deposits by the Cedar River. The top of the SIDP is marked by a broad floodplain intersected by valleys incised by the Cedar River. The ICL is a broad floodplain that is comprised of entrenched channels during the Little Cedar Formation and the Cedar River has formed a terraced surface in this valley. The shape of the ICL does not directly correspond with the underlying bedrock channel (Iowa Channel).

The Cedar Channel is a buried bedrock valley developed in a southeast-northwest direction across the southwestern portion of the map area, and this channel can be traced to the north. The channel is covered by Quaternary deposits, but the top of the channel is not visible due to the thickness of the overburden layer. The channel is inferred to be a pre-Quaternary feature that was incised by a pre-existing river. The channel is a continuation of the Cedar River, which flows through the Atalissa 7.5' Quadrangle and provides a significant source of water for the region.

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