Abstract: An ophiolitic complex (Ankara Melange), which was emplaced during the upper Miocene, forms the basement of the study area. Andesitic volcanic rocks cut the basement ophiolitic complex, which is overlain by a Cihanbeyli formation. Northeast of the Bolluk Lake, sixty-three travertine cones of various sizes and diameters can be observed penetrating the gypsum-bearing clays of the Cihanbeyli formation. One group of these cones is still forming today. The travertine cones, which developed along the fault line and are related to the local volcanism, extend parallel to the trend of Bolluk lake. At the same time, sulfate-bearing waters issuing from these cones has effected the high SO4= content of the Bolluk Lake water. Although these types of structures are not present around the Tersakan Lake, this lake is also fed by sulfate-bearing waters which discharge from a fault zone. The fault plane trends parallel to the eastern boundary of the lake. Mirabilite (Na2SO4.10H2O) crystallizes during the winter months in production pools in the Bolluk and Tersakan lakes. When the temperature reaches 25-30 °C in the months of July and August, the mirabilite crystals lose their water and are transformed into powdery thenardite (Na2SO4). As a result of an XRD study, it has been observed that, apart from mirabilite and thenardite, the mineral bloedite (Na2SO4.MgSO4.5H2O) also crystallizes in the production pools of the Bolluk and Tersakan lakes.