

Identifying Karst Pattern to Prevent Bell Spring from Being Submerged in Daryan Dam Reservoir

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Abstract : The large karstic Bell spring with a discharge ranging between 250 and 5300 lit/ sec is one of the most important springs of Kermanshah Province. This spring supplies drinking water of Nodsheh City and its surrounding villages. The spring is located in the reservoir of Daryan Dam and its mouth would be submerged after impounding under a water column of about 110 m height. This paper has aimed to render an account of the karstification pattern around the spring under consideration with the intention of preventing Bell Spring from being submerged in Daryan Dam Reservoir. The studies comprise engineering geology and hydrogeology investigations. Some geotechnical activities included in these studies include geophysical studies, drilling, excavation of exploratory gallery and shaft and diving. The results depict that Bell is a single-conduit siphon spring with 4 m diameter and 85 m height that 32 m of the conduit is located below the spring outlet. To survive the spring, it was decided to plug the outlet and convey the water to upper elevations under the natural pressure of the aquifer. After plugging, water was successfully conveyed to elevation 837 meter above sea level (about 120 m from the outlet) under the natural pressure of the aquifer. This signifies the accuracy of the studies done and proper recognition of the karstification pattern of Bell Spring. This is a unique experience in karst problems in Iran.

Keywords : bell spring, Karst, Daryan Dam, submerged

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