

Characterizing Sandstone from the Devil's Tower

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The Sundance Formation covers an area from Northern Montana to Northern Colorado and from Western South Dakota to Western Wyoming. The formation is fine- to medium- grained sandstone composed of quartz and is Upper Jurassic in age. This research focuses on the formation in the Devil's Tower area of Northeast Wyoming. Within the formation are various facies deposited under different depositional environments, including the Stockdale Beaver Shale overlain by the Hulett Sandstone. The Stockdale Beaver Shale, primarily slope forming, is roughly 30 meters thick and was deposited in a back-barrier lagoon setting. The Hulett Sandstone, cliff forming, is roughly 12 meters thick and was deposited under a series of tidal inlet sequences. The differences in depositional environments suggest that there could be variations in the physical properties of the rock. This research focuses on porosity and permeability, how much void space, by volume, is within the rock and how connected the void spaces are, respectively. To find these two properties of the rock, samples were taken from the formation and are currently being analyzed via thin section petrography. Porosity and permeability are important characteristics. They determine how much of a fluid can be stored in the rock, and how easily a fluid can move through the rock. Knowing something about these characteristics can give insight on how the formation could function as an aquifer, and how to make decisions about drilling water and/or oil wells.