

Drill Cuttings: One Man's Treasure, Another Man's Junk

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Successful exploration and development require accurate information about rocks. Petroleum geologists mainly use rock data inferred from petrophysical well logs, along with data from cores and outcrop. Typically, only minor amounts of drill cutting data are utilized. This is problematic because the log data set is most complete, yet gives limited rock data. Core and outcrop give excellent rock data, but are limited in availability. Drill cutting data is extensive, but is poorly utilized. We suggest that drill cutting data should be increasingly utilized, as it is critical for success. It is interdisciplinary and impacts engineering, drilling, exploration, and development.

We present: 1) "leading edge" equipment routinely used in cuttings examination in Calgary, including high-performance stereomicroscopes and digital cameras; 2) a summary of the Sneider Rock Typing system for visually estimating permeability; and 3) examples of different software and output that illustrate the different data types being derived from drill cuttings.

As examples of advanced techniques we discuss 1) the impact of depositional matrix elements such as clays, silts, dissolved carbonates, etc., on reservoir development. These features are poorly understood and often neglected, but the emplacement timing and distribution of these matrix elements has a profound impact on reservoir development; and 2) microFabric Analysis of carbonate drill chips using induced-interior-illumination. This technique provides significantly more facies and diagenetic information than can be obtained through conventional stereomicroscope methods. It is particularly powerful in deciphering original fabrics/facies of highly altered crystalline dolostones from drill chips.