

Characterization of USGS Core Repository oil shale core drilled near the ExxonMobil proposed RD&D lease

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Characterization of three cores housed in the USGS core repository in Denver was conducted to help aid ExxonMobil in preparation of a plan of development for a proposed Oil Shale Research, Development, & Demonstration (RD&D) Lease. These data will be combined with planned appraisal wells on the lease to provide a detailed description of the geology of the lease and its immediate surroundings. USGS core repository identifiers and locations (all in Rio Blanco County, Colorado):

§ B860	Industrial Resources Inc	Colorado Minerals 28-1	Sec. 28 1S 98W
§ CO42	Shell Oil	23X-2	Sec. 2 2S 98W
§ E095	Humble Oil	1 Ryan Ridge	Sec. 3 2S 98W

The characterization included detailed lithologic logging focused on the interval below the saline dissolution horizon, quantitative mineralogy by x-ray diffraction, classification of evaporite genetic settings and distributions, and determination of thermal conductivity. These data were combined with other data available (*e.g.*, Fischer Assay). Key observations include:

1. Thermal conductivity, measured approximately parallel to bedding, ranges from less than 0.7 to more than 1.4 W/mK. Thermal conductivity correlates positively with density and inversely with richness. Measured densities range between 1.7 and 2.4 g/cm³.
2. The detailed mineralogy reveals substantial variations in the proportions of related phases such as calcite-dolomite and microcline-buddingtonite. The data also demonstrate that periods of high organic matter accumulation can coincide with substantial evaporite mineral deposition.

Comparison of the detailed lithologic analyses from chronostratigraphically equivalent packages indicates that significant lithologic variations occurred over the distances demarked by these wells within the lake basin.