Desmoinesian Ismay-Hovenweep-Gothic Petroleum System, Blanding Sub-Basin of the Paradox Basin and Surrounds, Utah and Colorado

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Desmoinesian upper Ismay algal mounds produce oil and gas in the Blanding sub-basin of the Paradox Basin. Bioclastic and framework algal carbonate mounds provide superior reservoir quality and thicknesses up to 160 ft (53 m). Ismay mounds lie about 200 ft (66 m) stratigraphically above thick Paradox salt beds. Based on thickness maps, serial stratigraphic cross sections, and lithofacies relationships we propose that the anomalously thick upper Ismay mounds result primarily from differential salt movement that triggered differential sediment loading during Hovenweep and Ismay time. We also propose a linkage between basement tectonics and salt movement.

Gothic and Hovenweep shales are the most likely source rocks. Ismay pore fluids are assumed to relate to both organicmatter (OM) type and maturity levels, which assumption is supported by published geochemical data. The Blanding Basin is oil- and gas-prone; OM appears to be more marine in origin (Type I/II). The deeper part of the Laramide Paradox Basin is more gas-prone, OM appears to be more humic (Type III), and maturity appears to be elevated. In both areas we observe low mobile-water contents in the Ismay carbonates, and infer the same for Gothic and Hovenweep shales. However, in places each of these intervals appears to be in fracture communication with subjacent aquifers.