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Reining In The Superchannel: Deposition Of Mcmurray Formation IHS Through Moderate-Depth Channels

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ABSTRACT

Within the McMurray Formation, apparently concordant and continuous IHS-bearing successions are commonly observed, locally exceeding thicknesses of 40m. These successions can be interpreted to represent solitary IHS sets that accumulated within and adjacent to, deep meandering channels. However, a review of relevant literature suggests that exceptionally deep tidal channels are rare in the geomorphologic zones where IHS is thought to primarily accumulate. Based on these literature surveys and field work in various modern marginal marine environments, we suggest that although very thick IHS successions are plausible, bedsets less than 15m are far more common. Close examination of both core and outcrop bear this out; typically revealing significant discontinuities within IHS successions. This permits breaking the thicker units down into stacked sets with broadly consistent character and stratal orientation. Moreover, the stacking patterns can be related to sea-level trends.

We further suggest that the trough cross-bedded sands (megaripples) that typically underlay the IHS beds are commonly separated by a discontinuity. Thus earlier interpretations, which suggest that the megaripple facies represents channel-base deposits, may not be tenable.

Finally, the consistent orientation of stacked sets of IHS may result from the dictatory role valley form plays in the migration of a confined channel. As valley form remains consistent with system aggradation, so does the pattern of channel migration.