host sediment. Conversely, less conspicuous unlined burrows of *Thalassinoides* show enhancement of permeability.

Sorting is a fundamental control on primary porosity and biogenic sediment reworking can modify grain size sorting. Results demonstrate that intra-burrow porosity increases in open burrows such as *Thalassinoides*, where burrow fill is commonly coarser than matrix, although the converse relationship is true when the burrow-fill is mud-rich. Intra-burrow porosity is low in *Ophiomorpha* burrows, where thick mud and organic rich burrow fills and linings exist. Inter-burrow (matrix) porosity is commonly enhanced in highly bioturbated fabrics, where mud-grade material is removed from the matrix and incorporated into burrow linings and fills. In sparsely bioturbated facies, mud-rich inter-burrow porosity can be highly dependent on the behavior of the trace-making organisms and intensity of bioturbation.

Complex relationships exist between bioturbation and petrophysical properties in the studied material. Bioturbation can enhance or reduce porosity/permeability, dependent on trace fossil morphology, composition of burrow linings/fills, burrow size and bioturbation intensity. Our data should be compared with other studies of similar reservoir intervals to establish general models for the effects of bioturbation on petroleum reservoirs.

Does bioturbation enhance reservoir quality? A case study from the Cretaceous Ben Nevis Formation, Jeanne d' Arc Basin, offshore Newfoundland, Canada

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The delineation well Ben Nevis L-55 located in the Hebron/Ben Nevis Field of offshore Newfoundland, targets the Ben Nevis Formation in the petroleum-rich Jeanne d' Arc Basin. This case study focuses on the bioturbated net pay horizons, with the objective to understand the importance of animal sediment interactions in controlling the porosity and permeability of sandstone reservoir intervals. The net-pay interval is dominated by persistent and conspicuous *Ophiomorpha* burrows, which upon initial hypothesis (without laboratory analyses) have a direct relationship to enhancement of porosity and permeability. Results reveal this is not the case; *Ophiomorpha* burrows reduce permeability relative to the

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