

## **Fluid Flow Through Sand Injectites Intruded in Low Permeability Host Rocks**

By

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Sand remobilization and injection in overlying strata are being increasingly recognized in many hydrocarbon plays. Data obtained from offshore and onshore cases shows that sand remobilization is commonly occurring within deepwater clastics encased in fine-grained, impermeable hosts. Fluid flow histories within sand injectites are deduced using diagenetic studies. From early to late, three main events take place within sand injectites: a. development of deformation bands; b. precipitation of carbonate cements in pore spaces; c. precipitation of cements in tectonic veins. Early deformation bands solely occur within forceful emplaced bodies and they might originate during or very shortly after emplacement and thus provide a direct means of analyzing the fluids driving the injection. After a sand injectite is formed within a low permeability host, they will remain focused sites of fluid flow and cementation. Carbonate cementation can occur in various settings and reflects burial diagenesis of permeable structures within low permeability hosts at shallow burial (below 2km). Carbonate cementation is not intimately linked to the style of intrusion, hence it occurs both in forceful injected and in passively infilled intrusions. Pervasive cementation causes the intruded bodies to become competent and any tectonic deformation will cause focused fracturing of these bodies. This will especially be so if the host material deforms in a more plastic matter, as is often the case, since most intruded sandstones occur within mudstones. Thus a late stage of renewed fluid flow can often be demonstrated, even after the main phase of carbonate cementation during burial diagenesis occurred.