Cumulates of primitive mantle-derived magmas forming the Archaean Windimurra layered mafic intrusion (LMI) in the Yilgarn Craton yield radiogenic $^{176}\text{Hf}/^{177}\text{Hf}$ exceeding that of age-corrected mid-ocean ridge basalts (MORB) defining depleted mantle. This isotopic character is consistent with derivation from ultra-depleted mantle established as a primitive mantle reservoir in Hadean/early Archaean time. Ancient refractory mantle is believed to reside either in deep mantle or buoyantly underpin cratonic sub-continental lithospheric mantle (SCLM). We suggest either an ultra-depleted deep mantle reservoir was tapped by upwelling mantle or the SCLM of the Yilgarn Craton was partly re-melted; both required involvement of a hot mantle plume. Modelling shows the refractory Hf isotope signal is complementary to the Hadean zircon record from the north-western Yilgarn suggesting a co-genetic relationship. Unlike the ~2 Ga old Bushveld that partly samples the Kaapvaal SCLM, the Windimurra lacks continental isotope signatures or primary hydrous minerals. If LMI share common processes of mantle melting, we conclude: (1) LMI are sourced from deep mantle plumes; (2) the Yilgarn SCLM was not hydrated or metasomatised until ~3 Ga; (3) establishment of the Yilgarn SCLM may be related to melt events complementary to the Narryer terrane zircon record. Other Archaean plume-related mantle-derived melts with extreme radiogenic Hf isotope signatures, such as Barberton komatites, may also sample ultra-depleted mantle rather than ‘ordinary’ shallow depleted mantle, which could explain Hf-Nd isotope decoupling from a gently evolving ambient depleted mantle evident from the global zircon record.