
**Downdip ‘disappearance’ of the Guanaco channel complex:**

**Amalgamation by downcutting due to gradient steepening**

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The large (~10 km wide and 400 m thick), well exposed conglomeratic channel belt of the Cerro Toro Formation was deposited by sediment gravity flows, including high density turbidity currents, debris flows, and transitional ‘slurry’ flows. This channel belt occupied the axis of the Magallanes retro-arc foreland basin during the late Cretaceous (Coniacian/Santonian-Campanian) and flows moved from north to south. Proximal exposures of the channel belt at Sierra del Toro display three separate channel complexes: the Condor, Guanaco, and Wildcat channel complexes, from oldest to youngest. All complexes consists predominantly of conglomerate, with average and maximum clast sizes of about 10 and 40 cm, respectively. The Condor complex is at least 5 km wide and at least 200 m thick. The Wildcat complex is the largest complex exposed on Sierra del Toro with dimensions of 6-7 km width and 330 m thick. The Guanaco complex, sandwiched in between the two larger complexes, is considerably smaller: 2 km wide, consisting of five individual 10-70 m thick channels separated by 5-80 m thick mudstone intervals. These five channels display a progressively eastward offset stacking geometry.

Both the Condor and Wildcat complexes can be traced from the north (updip) face to the south (downdip) face of Sierra del Toro. The Guanaco complex, however, is exposed only on the north face and ‘disappears’ downdip. It is possible that the Guanaco complex onlaps submarine topography between the north and south faces of Sierra del
Toro, possibly created by the basinward advance of thrusting. However, this interpretation is not favored because the Guanaco complex consists of highly channelized depositional elements; sheetlike elements would be expected in the case of downdip onlap.

Instead, it is suggested that the Guanaco and Wildcat complexes amalgamate downdip and are thus indistinguishable on the south face of Sierra del Toro. This scenario requires significant downcutting of the Wildcat complex, as evidenced by: the large erosional features at the base of the Wildcat complex on the north face, suggesting that the flows were actively downcutting; 2) the downdip thickening of the Wildcat complex from 200 m to 330 m; 3) the progressive amalgamation seen from north to south of the uppermost Guanaco complex with the lowermost Wildcat complex; and 4) the lower stratigraphic position of the base of the Wildcat complex on the south face of Sierra del Toro.

Two forcing mechanisms for this downcutting are envisioned. First, an upslope migrating knickpoint could cause this amalgamation, yielding a ‘hanging valley’ between the north and south faces of Sierra del Toro. Alternatively, there may have been an increase in local gradient from the north face to the south face of Sierra del Toro. This gradient increase would have had to occur between the deposition of the Guanaco and the Wildcat complexes, and may be related to tectonic events, such as may have triggered the influx of coarse sediment reflected in the Wildcat complex.