

OBLIQUE ALAMO BOLIDE IMPACT? EXCEPTIONAL ALAMO BRECCIA PRESERVATION AT DEVILS GATE LS TYPE SECTION, EAST CENTRAL NEVADA

Alamo Impact Info and Assumptions

1 km sized icy cometary impacted Paleozoic Miogeocline near shelf-slope boundary ~300 meter water depth

Middle Frasnian—medial Punctata Conodont zone ±378 mya – (older guesses range from 382 to 362)

Impact effects documented in 400 km diameter: Utah, California, Las Vegas

Alamo 'Member' stratigraphy is radial zoning

Unit A = Tsunamiite(s) redeposited widespread impact breccia—outer zones

Unit B = Impact Breccia ejecta - not present 'distally'- inner zones

Unit C = Coherent slide blocks 'floating' in Breccia in Ring Zone backfill—inner zones

Devils Gate Section

Devils Gate ~210 km from impact centroid

Shelfal - lagoonal low productivity variably salinity carbonate environment as ejecta fell from the sky

Alamo Breccia Member:

Units A & B are both present - unique at this dist.

Unit A = 29 cm graded calc granule-arenite(?s)

Ir anomaly > Inner zones. Shocked qtz & hematite studs

Unit B = Calc diamictite ~0.5 to 1.4 meters

Contact with A is 'wavy': standing wave flow structure?

Oblique Impacts

<30° Angle of incidence produces asymmetric crater & impact deposits move away from isotropic ray model (Tycho)

< 15° Produces elliptical crater & Butterfly impact ejecta blanket symmetrically

No-ejecta zones both down and up-range. Ejecta to sides.

Speculation

Unit B not normal part of Distal Zone 3/Runup Realm model

Presence not consistent with orthogonal impact model

Alamo overall ejecta and structure is half-oval/ellipse

Perhaps an oblique impact better explains?

DG Alamo Member would be part of the butterfly ejecta pattern

The Argument

1. Impact breccia reached Devils Gate as an anisotropic blanket
2. Consistent with oval/elliptical structure of entire Alamo
3. Megatsunamis longitudinally traversed ~125 KM of the shallow shelf losing erosive energy *maybe* partially eroding the top DG breccia
4. Multiple tsunamis removed thin ejecta blanket everywhere else
5. Final Unit A Tsunamiite(s) preserved above a wavy contact, suggesting mild flow dynamics, with ejecta Unit B remnant.