

Hausback, B.P. and Abrams, M.J., 1996, Plinian eruption of La Virgen tephra, Volcan Las Tres Virgenes, Baja California Sur, Mexico: American Geophysical Union, Abstracts with Programs, Fall 1996 meeting, San Francisco, CA, p.813-814.

Plinian Eruption of La Virgen Tephra, Volcán Las Tres Virgenes, Baja California Sur, Mexico

BP Hausback (Geology Dept., California State Univ., Sacramento, CA 95819-6043; e-mail hausback@csus.edu)
MJ Abrams (Jet Propulsion Laboratory, MS 183-501, Pasadena, CA 91109; e-mail: mike@orizaba.jpl.nasa.gov)

Volcán Las Tres Virgenes (TV) is a composite cone in northern Baja California Sur, Mexico. The focus of this study is to evaluate volcanic hazards to the nearby area and to the Transpeninsular Highway (TH), linking the northern and southern Baja peninsula.

La Virgen tephra is a voluminous pumice airfall deposit resulting from a prehistoric eruption at TV and forms a prominent lobe that extends at least 30 km SW of TV (and is readily visible for 24 km on Landsat TM imagery; see mapped outline from imagery, LTM). The age of the pumice deposit is only constrained by an overlying basalt lava with a He-cosmogenic surface exposure date of 26 ± 4 ka (analysis by Jane Poths, site labeled BL on map) on the S side of the TH. At the base of the cone, 3 km SW of the summit of the volcano (S), this tephra is unsorted, at least 15 m thick, contains pumice blocks up to 40 cm diam., and lithic fragments up to 20 cm diam. The surface morphology at this site suggests a partially preserved tephra cone (TC) with more than 100 m of relief. Pumice deposits near the Mezquital dacite dome (MD), 5.5 km south of TV summit, 200 m N of the TH, drape mesas underlain by Miocene strata. These deposits contain pumice blocks up to 40 cm diam. and lithic fragments up to 60 cm diam., and their thickness locally appears to be as much as 28 m. A minimum volume of inflated tephra is estimated at 1.28 cubic km.

Near the MD, white/tan La Virgen pumice tephra is overlain, in succession, by surge tuff (up to 20 cm thick), agglutinated brown frothy scoria, pumice, black-glass-rimmed ejecta (this succession is called the Mezquital tephra (MT) and its distribution is labeled on the map), followed by dense glassy dacite lava of the MD. Major element analyses of the Mezquital tephra and dome show a restricted range in SiO₂ (65.7-66.7%). Analyses of La Virgen pumice span a broader range in SiO₂ (66.1-69.2%), and include compositions similar to those of the MD and tephra. The stratigraphy at MD may record the eruption of magma increasingly depleted in gas content: a plinian explosion of highly inflated La Virgen tephra, followed by eruptions, in sequence, of a local surge, weakly inflated MT, and the MD.

The distribution of large pumice and lithic clasts in La Virgen tephra suggests that it vented from the tephra cone at the SW base of TV and, perhaps, simultaneously from the vent now filled by the MD. (Hausback and Sawlan, 1995; Hausback, 1992, 1993)

**ISOPACHS ON
LA VIRGEN
TEPHRA**

