ACCRETIONARY LAPILLI AT THE CRETACEOUS-PALEOGENE (KT) BOUNDARY, VILLAGE OF ARMENIA, BELIZE. D. T. King, Jr.[1] and L. W. Petruny[2], [1]Geology Office, Auburn University, Auburn, Alabama 36849 USA.

Introduction: The Cretaceous-Paleogene (KT) boundary stratigraphy exposed on the north side of the Hummingbird Highway at the village of Armenia, Belize, includes the upper beds of the Maastrichtian Barton Creek dolostone, which is overlain by a lateritic clay bed (paleosol) containing dolomite boulders. This is in turn overlain by an accretionary spherule-bearing clay layer (~ 2 m), which is the focus of this paper. Above the spherule-bearing layer lies a limestone conglomerate bed, which contains abundant rounded and polished limestone clasts in an impact-glass bearing clayey matrix [1] (Fig. 1). The upper rounded and polished limestone clast bed is not unique to Armenia, it has been found elsewhere in northern Belize at the KT boundary, including Progresso Lagoon [2].

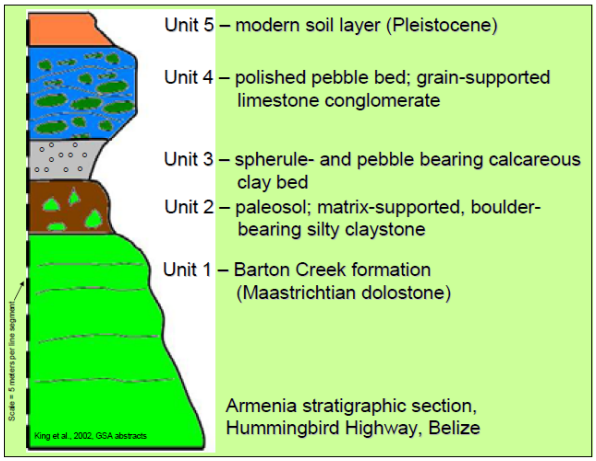

Figure 1. KT stratigraphy at Armenia, Belize.

Armenia spherules: The spherules from the spherulic bed at Armenia are the focus of this study. Accretionary spherules at Armenia range in size from less than one millimeter to 1.5 cm. A typical spherule consists of a core (usually a carbonate grain, but in some instances impact glass) that is surrounded by concentric layers of clayey calcium carbonate (Figs. 2-6). The surface (or "shell") of each concentric layer is harder than the lower part of the layer. Concentric layers range in thickness from < 0.001 mm to > 1 mm and are structureless to vaguely laminated. Some layers are silty. It is likely that the carbonate in each concentric layer was deposited as microcrystalline lime, but has now converted to low magnesium calcite. Aggradational recystallization among calcite crystals is evident in thin section, and this is interpreted to have accompanied the lime to calcite conversion.

Relationship to Chicxulub crater: The spherules at Armenia are interpreted as Chicxulub vapor plume deposits, based upon their stratigraphic position and their internal physical structure, which strongly resembles a typical accretionary lapillus formed by impact [4]. Unlike previously reported accretionary grains from a ~ 1-m thick impactoclastic clay layer at Albion Island in northern Belize [3], the Armenia spherules are almost all nearly perfectly spherical and nearly all of them display distinctive internal layering.

These spherulitic deposits occur at ~ 4 crater radii from the center of the Chicxulub impact structure, which is located on the Yucatán peninsula, México.

References: [1] Pope K.O. et al. (2005) *GSA Spec. Paper 384*, 171-190. [2] King Jr. D.T. et al. (2004) *GCAGS Transactions*, *54*, 289-304. [3] Ocampo A.C. et al. (1996) *GSA Spec. Paper 307*, 75-88. [4] Warme J.E. et al. (2002) GSA *Spec. Paper 356*, 489-504.

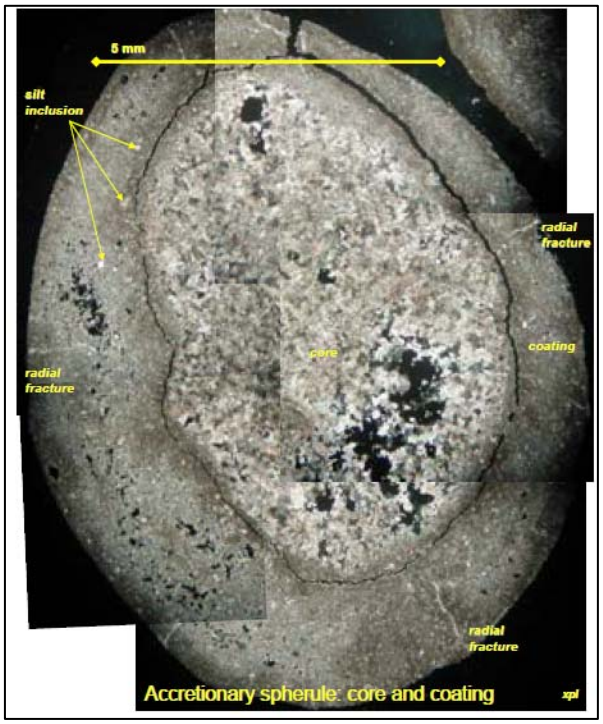

Figure 2. Thin-section photomosaic of accretionary spherule from Armenia, Belize. Shows both radial and concentric structure and aggradational recrystallization. Core was a carbonate grains. Scale bar is ~ 5 mm.

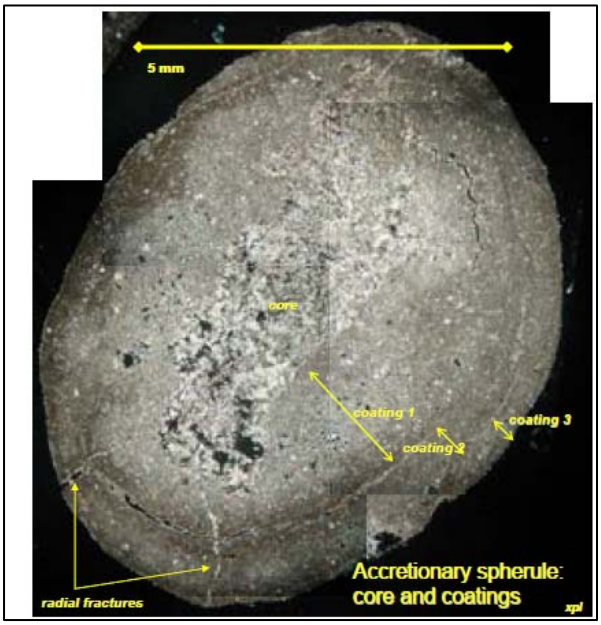

Figure 3. Thin-section photomosaic of an accretionary spherule from Armenia, Belize. Shows both radial and concentric structure, plus aggradational recrystallization. Core was a carbonate grain. Scale bar is ~ 5 mm.

Figure 4. Thin-section photomicrograph of an accretionary spherule from Armenia, Belize, which is still in matrix that contains impact glass fragments. Scale bar is ~ 2 mm.

Figure 5. Thin-section photomicrograph of an accretionary spherule (in matrix) with an impact glass fragment as its core. Scale bar is ~ 2 mm.

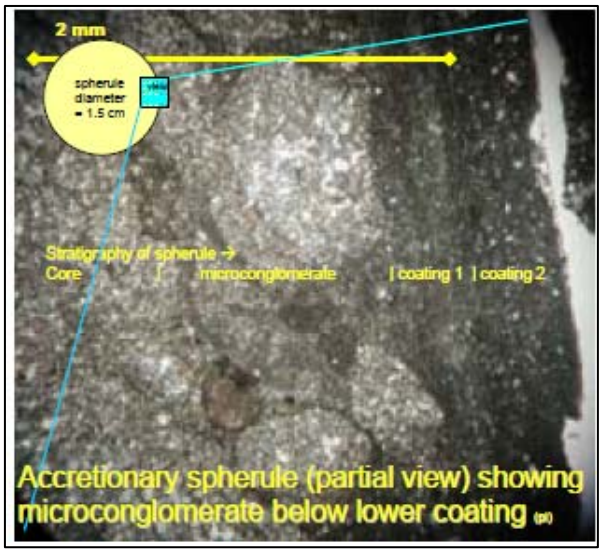

Figure 6. Thin-section photomicrograph of outer part of a ~ 1.5 cm diameter spherule (location of view is shown by blue box and yellow circle). Stratigraphy of spherule is: core; micro-conglomerate layer; coating 1; and coating 2. Scale bar is 2 mm.