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# The Source Provenance of an Obsidian Eden Point from Sierra County, New Mexico

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Eden projectile points associated with the Cody complex are underrepresented in the late Paleoindian record of the American Southwest. EDXRF analysis of an obsidian Eden point from a site in Sierra County, New Mexico demonstrates this artifact is from the Cerro del Medio (Valles Rhyolite) source in the Jemez Mountains. We contextualize our results by examining variability in obsidian procurement practices beyond the Cody heartland in southcentral New Mexico.

**Keywords** Eden, New Mexico, Jemez Mountains, obsidian, EDXRF

The Cody complex and its associated Eden projectile point technology are present in late Paleoindian assemblages throughout much of North America, though research has primarily focused on the Great Plains and Rocky Mountains which are considered to be the Cody “heartland” (Knell and Muñiz 2013b; Kornfeld et al. 2010). The American Southwest is outside this heartland, and a considerable research gap exists in our understanding of the source provenance of diagnostic Eden points and Cody artifacts in this region. Cody knappers in New Mexico largely used chert to manufacture Eden points, but other materials including obsidian were occasionally used (Amick and Lukowski 2006; Boldurian and Cotter 1999; Judge 1973; Roberts 1942; Shackley 2011; Stanford and Patten 1984). Because obsidian Cody artifacts are underrepresented in the archaeological record of the American Southwest, we report on a complete obsidian Eden point from a site in southcentral New Mexico. Even though we discuss the results of an energy-dispersive X-ray fluorescence (EDXRF) analysis on one artifact, we contextualize our study within the regional pattern of obsidian source-use to contribute to late Paleoindian obsidian procurement

beyond the Cody heartland, a topic of interest among Paleoindian archaeologists (Amick 2012).

Site LA 175204 in Sierra County (Figure 1), New Mexico, is located on White Sands Missile Range, which is part of the larger Jornada Mogollon culture area. Surface diagnostic artifacts from the site include Eden, Goshen, Plainview, San Pedro, and San Jose points, along with ground-stone artifacts and a robust assemblage of chipped-stone flakes of gray and white chert. The Eden point was the only obsidian artifact observed. Site conditions suggest that sediment movement has occurred by eolian and alluvial transport, but that the ground surface is a deflated, unvarnished desert pavement that likely has thousands of years of cultural deposition compressed into a relatively shallow vertical depth.

The Eden point (Figure 2) has characteristics typical of other Eden points described in the literature: pronounced opposing medial ridges creating a diamond-shaped cross-section, negative flake scars that are perpendicular and uniform in width, and a long, narrow outline (Bradley and Frison 1987; Knell and Muñiz 2013a; Pitblado 2003; Wormington 1957). The point is 7.5 cm in length, 1.5 cm wide, and 0.6 cm thick.

Many of the obsidian nodules from Tertiary period sources in New Mexico and the secondary gravel

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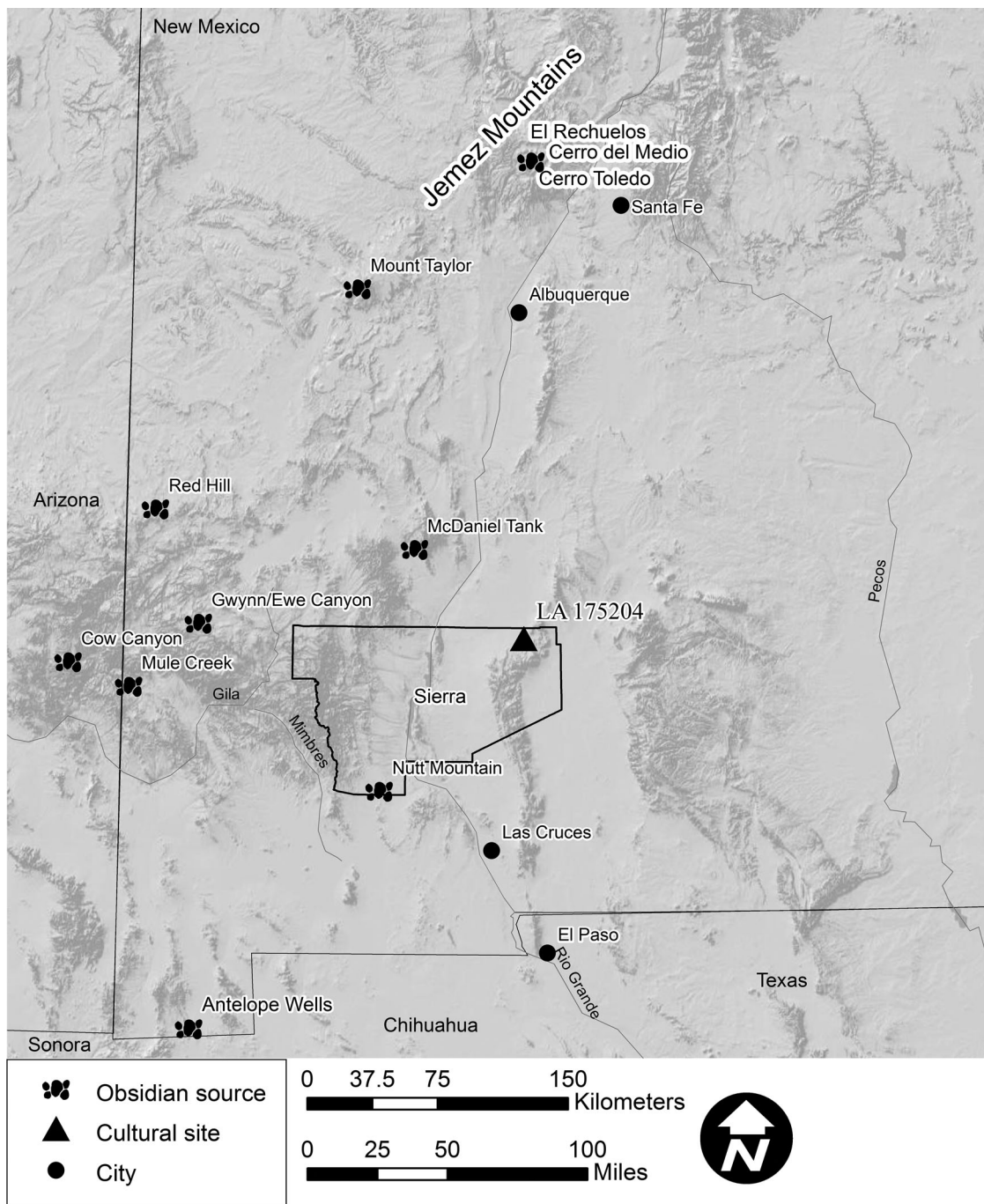
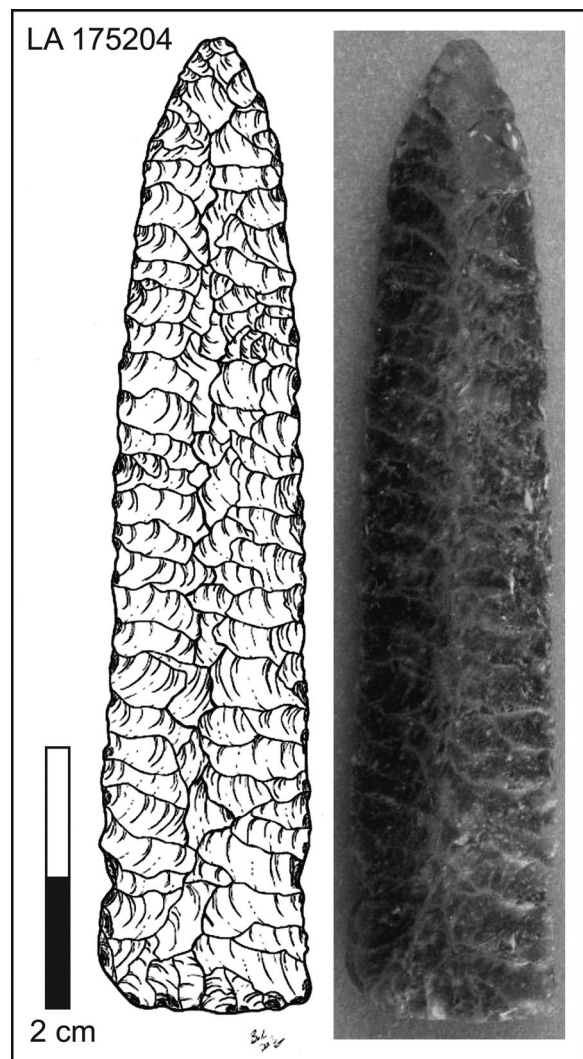


Figure 1 The location of site LA 175204 in relation to known obsidian sources.

deposits of obsidian in the Quaternary alluvium of the Rio Grande are too small to manufacture an Eden point of this size (Shackley 2005, 2013). Using EDXRF, Shackley (2014) determined the artifact geochemically matches Cerro del Medio (Valles Rhyolite), an obsidian source located within the Valles Caldera proper in the Jemez Mountains, northern New Mexico, approximately 280 linear kilometers north of LA 175204. Two other geochemically distinct sources from the Jemez, Cerro Toledo and El Rechuelos, were also used widely throughout time and space (Baugh and Nelson 1987; Glascock et al. 1999; Shackley 2005, 2013). Cerro del Medio material

quality is intermediate between Cerro Toledo and El Rechuelos, as it can have a granular-like texture similar to El Rechuelos, but often has devitrified spherulites like some Cerro Toledo glass, decreasing knapping quality and potentially affecting biface production (Shackley 2013).

Dolan et al. (2015) demonstrate that people throughout time in the Jornada Mogollon region near LA 175204 mainly used Cerro Toledo obsidian. El Rechuelos is present in some assemblages, but Cerro del Medio is virtually nonexistent. Cerro del Medio is uncommon in this region due to its location within the caldera. As a result of its relatively recent



**Figure 2** Obsidian Eden point from site LA 175204. Drawing by Robert DeBry.

formation, it is the only Jemez obsidian that has not eroded into the Rio Grande in any appreciable size or quantity (Church 2000; Shackley 2005, 2013). Direct procurement inside the caldera or trade and exchange are the only means of obtaining this glass. Because Cerro del Medio material cannot be collected from secondary Rio Grande gravel deposits further south near LA 175204, the raw material that this Eden point started off as had to have been directly procured from the primary source. It is difficult to ascertain whether this point was manufactured at the primary source or as it moved down-the-line, eventually ending up on the surface of LA 175204.

More is known about Clovis and Folsom obsidian procurement than Cody obsidian procurement in the American Southwest because of the lack of sites and fewer Eden points (Hamilton et al. 2009; Huckell et al. 2011; LeTourneau and Shackley 2009). However, source provenance analysis on 27 Cody artifacts reported by LeTourneau and Shackley (2009) and one Eden point by Pinson et al. (2009)


demonstrate groups used El Rechuelos the most ( $n = 12$ ), but Cerro del Medio ( $n = 7$ ), Cerro Toledo ( $n = 7$ ), and Grants Ridge in Mount Taylor ( $n = 2$ ) are also present. Judge (1973) mentioned obsidian Eden points from his survey near the Rio Grande, but upon further study of these artifacts in the Baker Collection at Southern Methodist University, it is apparent that not all may be diagnostic of Eden. Additional analysis of these materials is warranted.

Three patterns emerge from our brief discussion above. First, Cody groups in the American Southwest preferred entering the Jemez Mountains for their obsidian. Additionally, there is variability within Jemez source-use, but Cody knappers selected El Rechuelos most often, possibly due to its higher-material quality or because of other socio-economic reasons like seasonal mobility. It could be argued that the Eden point from LA 175204 was obtained using a different procurement strategy or via a trading network because of the infrequency of Cerro del Medio use in Cody manufacture. Finally, other obsidian sources in New Mexico like Mule Creek and Antelope Wells that are important in later time periods were generally not used for most Paleoindian points due to their smaller nodule sizes which were not adequate for production. There is variability among Cody groups in the heartland (Blackmar 2001), but in this brief report we have provided supporting evidence from southcentral New Mexico to demonstrate variability within obsidian procurement practices in an understudied region outside the Cody heartland. To advance our understanding of obsidian source-use heterogeneity during the late Pleistocene, we recommend additional obsidian sourcing on Eden points and Cody artifacts as they become available.

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