A Paleontological Resource Survey for the
East Mesa Public Safety Complex and Recreation Area,
Section 3, T23S, R2E
Doña Ana County, New Mexico;

For Bureau of Land
Management-Las Cruces District Office (BLM/LCDO)

Overview of project area. View is to the east.

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Introduction

The City of Las Cruces proposes to develop the East Mesa Public Safety Complex and Recreation Area. Due to the rapidly growing population on the East Mesa of Las Cruces, the area is in need of additional public safety facilities to serve the population. As part of the safety complex, a fire station and police sub-station is proposed. Additionally, recreational amenities will be included with the addition of walking/multi-use trails, sport fields, and open space.

The project area is underlain by the Pliocene to early Pleistocene Camp Rice Formation, designated as Class 4 in the Potential Fossil Yield Classification System (PFYC). The Camp Rice Formation has produced important vertebrate fossils (e.g., Lucas *et al*., 1998; Lucas *et al*., 2000; Morgan *et al*., 1998). A paleontology survey was required by the BLM/LCDO. Paleontological surveying consisted of two days of field work on December 26 and 27, 2013.

Location

The City of Las Cruces plans to lease land from the BLM under the provisions of the Recreation and Public Purposes (R&PP) Act, as amended, under the BLM case file number NMNM 128496. The project area is approximately 346.59 acres managed by the BLM. The project area is situated east of Mission Espada and Mission Santa Clara subdivisions and north of the South Fork Subdivision. The property also contains both North and South Fork Arroyos of the main Las Cruces Arroyo. The land encompasses the following legal descriptions:

New Mexico Principal Meridian, New Mexico T. 23 S., R. 2 E., sec. 3, lots 1 and 2, SW¼NE¼, N½SE¼NE¼, SW¼SE¼NE¼, E½W½W½E½SE¼NW¼, E½W½E½SE¼NW¼, E½E½SE¼NW¼, E½W½E½NE¼SW¼, E½E½NE¼SW¼, E½W½E½SE¼SW¼, E½E½SE¼SW¼, W½NE¼SE¼, SE¼NE¼SE¼, W½SE¼, and SE¼SE¼.

UTM Coordinates (See **Appendix 1 – Project Map**):

	Easting WGS 84	Northing
1	337612	3579916
2	338403	3579916
3	337409	3578314
4	338379	3578292

Geology and Geomorphology

The project area is located just east of an existing housing development (**Figure 1**). The land surface is undulating, covered with unconsolidated medium-grained sand and gravel deposits that are heavily dissected by small meandering and braided drainages (**Figures 2, 3**). Gravels are concentrated on the surface as lag deposits, and are mixed with soils below the surface (**Figures 4, 5**). Gravels are primarily volcanic, and include rhyolite and andesite, though large chert granules and pebbles are also present. Two large, established arroyos are located at the north end and south end of the project area (**Figure 6**). The entire region is variably covered by creosote, mesquite, yucca, cacti, and grassy vegetation (**Figure 7**).

The area surveyed has been variably impacted by human activity. ATV tracks, dirt roads, small excavation sites, bull-dozed areas, trash, and foot traffic are in evidence (**Figures 8-11**).

The project location is in the Jornada Basin, one of many north-south trending fault block uplifts along the Rio Grande Rift. The stratigraphically youngest basin fill in the project area is the Camp Rice Formation, though outcrops do not appear at the surface. The Camp Rice formation consists of late Pliocene to early Pleistocene conglomerates and sandstones deposited on alluvial fans and alluvial flats, and crossbedded and horizontally laminated pebbly sand/sandstone and mudstone deposited by the ancestral Rio Grande (Seager and Mack, 1994; Mack et al., 1998a). Mammal fossils place the Camp Rice formation in the Blancan North American Land Mammal Age (Morgan et al., 1998). These sedimentary units have a Class 4 rating in the PFYC system – "Geologic units containing a high occurrence of significant fossils".

Paleontological Surveying Methodology

On the dates listed above John Burris, Paleontologist under contract by Zia Engineering & Environmental Consultants, LLC, and Kenneth Heil, both BLM-permitted consulting paleontologists (Burris permit # NM 13-03 C; Heil permit # NM 13-04 C), prospected the project area for vertebrate fossils. Drainage walls carved by erosion were examined for bones or teeth. Anthills were examined for microfossils.

A GPS unit and digital camera were used to record the survey.

Paleontological Survey Results – Negative Report

No vertebrate fossils were found along any portion of the project area. Additionally, no known fossil localities exist within 1 mile of the project area.

The project area crosses PFYC Class 4b:

> ***"Class 4*** – **High**. Geologic units containing a high occurrence of significant fossils. Vertebrate fossils or scientifically significant invertebrate or plant fossils are known to occur and have been documented, but may vary in occurrence and predictability. Surface disturbing activities may adversely affect paleontological resources in many cases."
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> *"**Class 4b*** – These are areas underlain by geologic units with high potential but have lowered risks of human-caused adverse impacts and/or lowered risk of natural degradation due to moderating circumstances. The bedrock unit has high potential, but a protective layer of soil, thin alluvial material, or other conditions may lessen or prevent potential impacts to the bedrock resulting from the activity.
>
> - Extensive soil or vegetative cover; bedrock exposures are limited or not expected to be impacted.
> - Areas of exposed outcrop are smaller than two contiguous acres.
> - Outcrops form cliffs of sufficient height and slope so that impacts are minimized by topographic conditions.
> - Other characteristics are present that lower the vulnerability of both known and unidentified paleontological resources."

Development of the project area should proceed without the need for an on-site paleontology monitor. During excavation, vertebrate fossils may be uncovered, at which point excavation or disturbance in a 50 foot radius of the discovery should halt until the BLM-permitted paleontologist can examine the specimen to determine the appropriate next steps. The operator may then be allowed to continue excavation through the site, or will be given the choice of either

(1) following the BLM-permitted paleontologist's instructions for stabilizing the fossil resource in place and avoiding further disturbance to the fossil resource, or (2) following the BLM-permitted paleontologist's instructions for mitigating impacts to the fossil resource prior to continuing construction through the project area, which may include halting excavation in the vicinity until the specimen can be safely collected by a BLM-permitted paleontologist.

References Cited

Lucas S. G., Morgan, G. S., and Mack, G. H., 1998, Early Pleistocene (Early Irvingtonian) Co-occurrence of the Proboscideans *Cuvieronius, Stegomastodon*, and *Mammuthus* at Tortugas Mountain, Doña Ana County, New Mexico, *in* New Mexico Geological Society Guidebook, 49th Field Conference, Las Cruces Country II, p.34.

Lucas, S. G., Morgan, G. S., and Estep, J. W., 2000, Biochronological Significance of the Co-occurrence of the Proboscideans *Cuvieronius*, *Stegomastodon,* and *Mammuthus* in the Lower Pleistocene of Southern New Mexico *in* New Mexico's Fossil Record 2, Spencer G. Lucas, ed., New Mexico Museum of Natural History and Science Bulletin 16, p. 209 – 216.

Mack, G. H., Kottlowski, F. E., and Seager, W. R., 1998a, The Stratigraphy of South-Central New Mexico *in* New Mexico Geological Society Guidebook, 49th Field Conference, Las Cruces Country II, p. 135 – 154.

Morgan, G. S., Lucas, S. G., and Estep, J. W., 1998, Pliocene (Blancan) vertebrate fossils from the Camp Rice Formation near Tonuco Mountain, Doña Ana County, Southern New Mexico *in* New Mexico Geological Society Guidebook, 49th Field Conference, Las Cruces Country II, p. 237 – 249.

Seager, W. R., and Mack, G. H., 1994, Geology of east Potrillo Mountains and vicinity, Doña Ana County, New Mexico, New Mexico Bureau of Mines & Mineral Resources Bulletin 113, 27 p.

Figures

Figure 1: Overview of project area showing housing development on the western border. View is to the southwest.

Figure 2: Overview of project area, showing undulating ground covered by shrubby vegetation in unconsolidated sand and gravel deposits. View is to the north.

Figure 3: Gravel lag deposit dissected by small drainage channel.

Figure 4: Gravel lag deposit concentrated on surface of undisturbed portion of the project area.

Figure 5: Unconsolidated sand and gravel deposits exposed along a drainage channel.

Figure 6: Major arroyo in southeast portion of project area. View is to the northwest.

Figure 7: Yucca and creosote found throughout the project area.

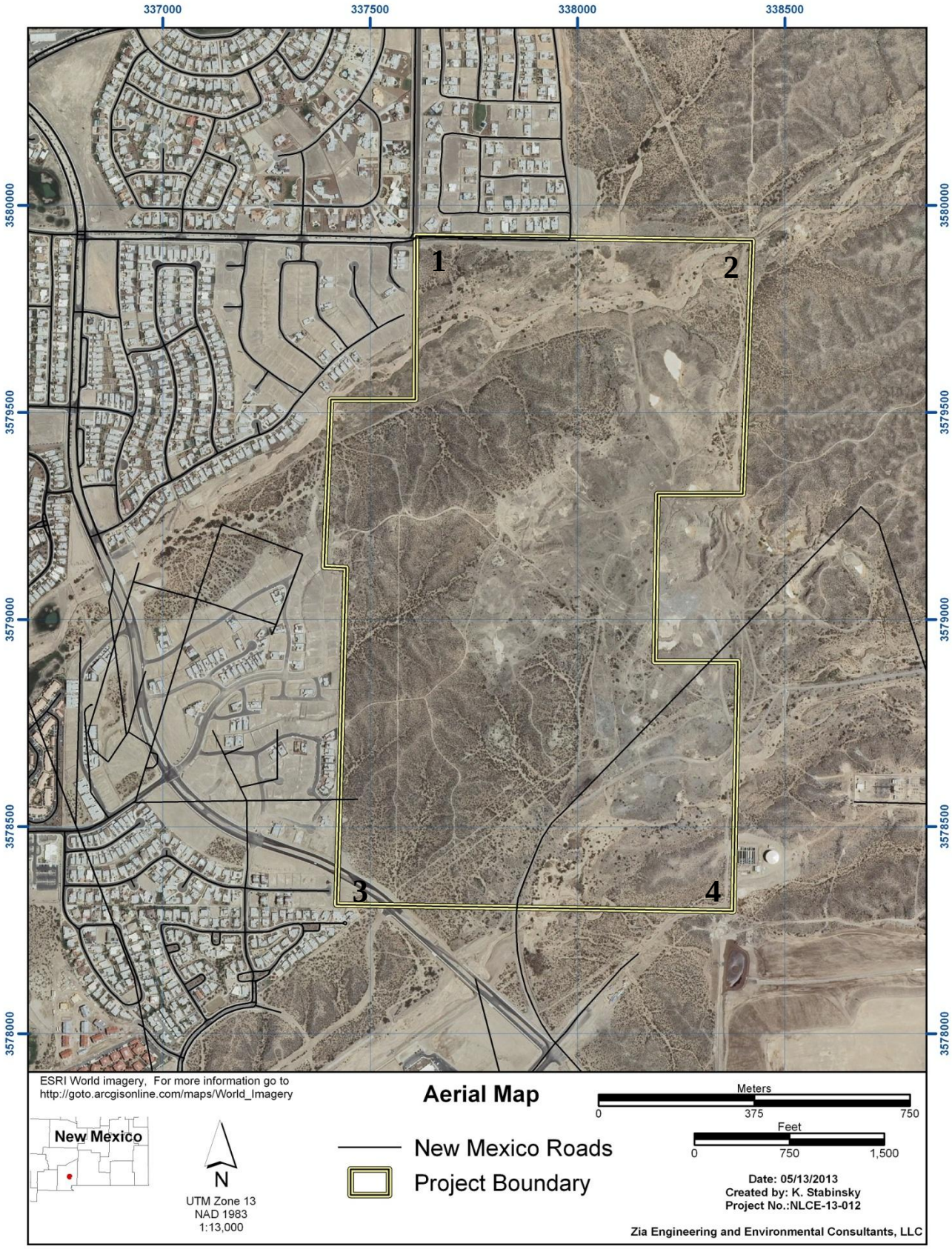
Figure 8: Trash is found throughout project area.

Figure 9: Project area is heavily impacted by human activity, including a number of roads and ATV tracks. View is to the northwest

Figure 10: Project area is heavily impacted by human activity, including a number of roads and ATV tracks. View is to the northwest.

Figure 11: Project area is heavily impacted by human activity, including a number of roads and ATV tracks. View is to the north.

Appendix 1 – Project Map



Appendix 2 – Potential Fossil Yield Classification Map