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4 March 2016

LSA Associates, Inc.
20 Executive Park, Suite 200
Irvine, California 92614

Attn: Sarah Rieboldt, Ph.D., Paleontologist

re: Paleontological Resources Records Check for the proposed High Speed Rail Project - Burbank to Los Angeles Segment, LSA Project # STI1501A, in the Cities of Burbank, Glendale, and Los Angeles, Los Angeles County

Dear Sarah:

I have thoroughly searched our paleontology collection records for the locality and specimen data for the proposed High Speed Rail Project - Burbank to Los Angeles Segment, LSA Project # STI1501A, in the Cities of Burbank, Glendale, and Los Angeles, Los Angeles County as outlined on the portion of the Burbank, Hollywood, and Los Angeles USGS topographic quadrangle maps that you sent to me via e-mail on 18 February 2016. The proposed project area may cross the boundaries of one of our generalized localities, and we have other localities nearby from the same deposits that may occur either at the surface or at depth in the proposed project area.

In the northern portion of the proposed project area, southward along San Fernando Road to around the junction of the Golden State Freeway (I-5) and the Glendale Freeway (Highway 2), the surface deposits consist of younger Quaternary Alluvium, predominately derived as alluvial fan deposits from the Verdugo Mountains, the San Rafael Hills, and Adams Hill to the east, with fluvial deposits from Verdugo Wash that currently crosses the proposed project area route near the junction of the Golden State Freeway (I-5) and the Ventura Freeway (Highway 134), as well as from the Los Angeles River that parallels the proposed project route area from the freeway junction southward to the Glendale Freeway (Highway 2). South of the Glendale Freeway

(Highway 2) the eastern route of the proposed project area closely parallels the current Los Angeles River channel down to Taylor Junction where it cross the Los Angeles River and joins the western route of the proposed project area just west of Mission Junction, crossing surface deposits consisting entirely of fluvial overbank deposits. From there southward to the southern terminus just south of the Hollywood Freeway (Highway 101), the recombined proposed project area routes cross further surface fluvial deposits from the floodplain of the Los Angeles River. The western route of the proposed project area, however, crosses the hills in Elysian Park and east of Dodger Stadium that have exposures of the marine late Miocene Puente Formation (also referred to as the lower Modelo Formation or the Monterey Formation in this area). The Puente Formation also underlies the Quaternary Alluvium in the central to southern portion of the proposed project area at moderate depth.

The younger Quaternary alluvial fan and fluvial deposits exposed in most of the proposed project area typically do not contain significant vertebrate fossils, at least in the uppermost layers, but are underlain mostly by older Quaternary deposits but also by the marine late Miocene Puente Formation near Elysian Park, that may well contain significant fossil vertebrate remains. Our closest vertebrate fossil locality from older Quaternary deposits to the northern portion of the proposed project area in the San Fernando Valley is LACM 6970, west of the proposed project area route along Lankershim Boulevard just east of Tujunga Wash and just north of the Los Angeles River towards the Ventura Freeway (Highway 134). Locality LACM 6970 was collected during construction of the Metrorail Redline Universal City Tunnel at approximately 60' to 80' below grade. Specimens of typical larger late Pleistocene fossil vertebrates such as ground sloth, *Glossotherium harlani*, elephant, Proboscidea, camel, *Camelops hesternus*, and bison, *Bison antiquus,* were recovered from locality LACM 6970. Further south along Lankershim Boulevard and south of the Los Angeles River we have additional vertebrate fossil localities, LACM 6306 and 6385-6386, also collected during salvage mitigation for construction of the Metrorail station and tunnels at depths approximately 40' to 60' below the surface. These localities produced fossil specimens of stickleback fish, Gasterosteidae, frogs, *Rana* and Hylidae, lizards, *Gerrhonotus* and *Uta*, snakes, *Thamnophis* and *Tantilla*, bird, Aves, shrew, *Sorex*, rabbit, *Sylvilagus*, and rodents, *Perognathus*, *Thomomys*, *Dipodomys*, *Microtus*, and *Peromyscus*.

Our closest vertebrate fossil locality from these older Quaternary deposits to about the central portion of the proposed project area north of Elysian Park is LACM (CIT) 342, east of this portion of the proposed project area route east of the Pasadena Freeway (I-110) and east of Eagle Rock Boulevard just south of York Boulevard. Fossil specimens of turkey, *Parapavo californicus*, and mammoth, *Mammuthus*, were recovered from locality LACM (CIT) 342 at a depth of 14 feet below the surface. The fossil turkey specimen from locality LACM (CIT) 342 was published in the scientific literature by L.H. Miller in 1942 (A New Fossil Bird Locality. Condor, 44(6):283-284) and the mammoth specimen was a rare, nearly complete skeleton.

Our closest vertebrate fossil locality from these older Quaternary deposits beneath the younger Quaternary Alluvium to the southern portion of the proposed project area is LACM 1023, east of Taylor Junction and east of the Golden State Freeway (I-5) near the intersection of Workman Street and Alhambra Avenue, where excavations for a storm drain recovered fossil

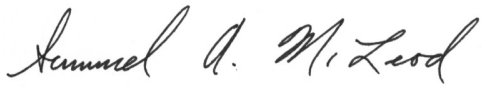
specimens of turkey, *Meleagris californicus,* sabre-toothed cat, *Smilodon fatalis*, horse, *Equus*, and deer, *Odocoileus*, at unstated depth. A specimen of the turkey, *Meleagris*, from this locality was published in the scientific literatus by D. W. Steadman (1980. A Review of the Osteology and Paleontology of Turkeys (Aves: Meleagridinae). Contributions in Science, Natural History Museum of Los Angeles County, 330:131-207). Just south of locality LACM 1023, still east of the Golden State Freeway but near the intersection of Mission Road and Daly Street, we have another older Quaternary locality, LACM 2032, that produced fossil specimens of pond turtle, *Clemmys mamorata*, ground sloth, *Paramylodon harlani*, mastodon, *Mammut americanum*, mammoth, *Mammuthus imperator*, horse, *Equus*, and camel, *Camelops*, at a depth of 20-35 feet below the surface. The pond turtle specimens from locality LACM 2032 were figured in the scientific literature by B.H. Brattstrom and A. Sturn (1959. A new species of fossil turtle from the Pliocene of Oregon, with notes on other fossil *Clemmys* from western North America. Bulletin of the Southern California Academy of Sciences, 58(2):65-71).

Where the western route of the southern portion of the proposed project area crosses the hills of Elysian Park, it may fall within the boundaries of our general Elysian Park locality LACM 4967 from the Puente Formation. Locality LACM 4967 produced the holotype (name bearing specimen of a species new to science) of the fossil herring *Clupea tiejei* (L. R. David, 1943. Geological Society of America Special Paper, 43:92). East of this portion of the proposed project area, east of Elysian Park between the Los Angeles River and the Golden State Freeway (I-5) south of the Pasadena Freeway (I-110), our Puente Formation locality LACM 7507 produced a specimen of the fossil snake mackerel, *Thyrsocles kriegeri*. East of the northernmost part of Elysian Park, east of the Los Angeles River and the Golden State Freeway but on the very southwestern part of Mt. Washington, our Puente Formation locality LACM 1880, produced a suite of fossil bony fish including hatchetfish, *Argyropelecus bullockii*, bristlemouth, *Cyclothone*, herring, *Etringus*, rockfish, Scorpaenidae, extinct deep-sea fish, *Chauliodus*, slickheads, Alepocephalidae, cod, *Eclipes*, and croaker, *Lompoquia*. A little farther east of Elysian Park, in the hills of Lincoln Heights, our Puente Formation locality LACM 3882 produced the holotype specimen of the fossil cetotheriid baleen whale *Mixocetus elysius* (R. Kellogg, 1934. Carnegie Institution of Washington Publication, 447(3):86), one of the most complete fossil whale skulls known from California.

Surface grading or very shallow excavations in the uppermost few feet of the younger Quaternary Alluvium in most of the proposed project area are unlikely to uncover significant fossil vertebrate remains. Deeper excavations in those portions of the proposed project area that extend down into older sedimentary deposits, however, as well as any excavations in the Puente Formation exposures in the hills of the Elysian Park vicinity, may well encounter significant vertebrate fossils. Any substantial excavations in the proposed project area, therefore, should be closely monitored to quickly and professionally collect any specimens without impeding development. Also, sediment samples should be collected and processed to determine the small fossil potential in the proposed project area. Any fossils recovered during mitigation should be deposited in an accredited and permanent scientific institution for the benefit of current and future generations.

This records search covers only the vertebrate paleontology records of the Natural History Museum of Los Angeles County. It is not intended to be a thorough paleontological survey of the proposed project area covering other institutional records, a literature survey, or any potential on-site survey.

Sincerely,



Samuel A. McLeod, Ph.D.
Vertebrate Paleontology

enclosure: invoice