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To: Mr. Marc Melinkoff, Senior Project Manager
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From: E. Bruce Lander, Ph.D., Principal
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Date: October 12, 2004

Subject: Paleontologic resource evaluation in support of development of DS Ventures, LLC, Patriot Homes parcel, Woodland Hills, Los Angeles County, California

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DS Ventures, LLC, proposes to construct a condominium development on a 6.19-acre parcel in the community of Woodland Hills in the northwestern portion of Los Angeles, California. The parcel is situated at the southwestern corner of the San Fernando Valley along the northern base of the Santa Monica Mountains, and is bounded to the south and southeast by Mulholland Drive at its intersection with Mulholland Highway, to the northwest by San Feliciano Drive, and to the northeast by Girard Reservoir. Topographic map coverage of the parcel is provided by the United States Geological Survey Canoga Park Quadrangle, California-Los Angeles Co., 7.5 Minute Series (Topographic) (1967, photorevised 1976).

This paleontologic resource evaluation was required by the City of Los Angeles because of the potential for fossil remains being encountered at fossil sites in the parcel as a result of earth-moving activities associated with development of the parcel. A field survey of the parcel, reviews of pertinent geologic and paleontologic maps and literature covering the parcel and vicinity, and an archival search at the Natural History Museum of Los Angeles County Vertebrate Paleontology Department (LACM) (McLeod 2004) were conducted in support of this evaluation. The field survey and the literature and map reviews were conducted by Dr. E. Bruce Lander, a vertebrate paleontologist with Paleo Environmental Associates, Inc.

Environmental Setting

As mapped by Dibblee (1992), the parcel is underlain by two Cenozoic stratigraphic rock units, including (in ascending stratigraphic order) an unnamed late Miocene marine shale, which underlies the hill in the southeastern portion of the parcel, and Holocene younger alluvium, which underlies the remainder (lower, flat-lying portion) of the parcel. Both rock units have yielded fossil remains at previously recorded fossil sites in Los Angeles, particularly along the southern margin of the San Fernando Valley and/or along the adjacent northern base of the Santa Monica Mountains.

Unnamed Late Miocene Marine Shale

The unnamed late Miocene marine shale (upper member of Modelo Formation of Hoots 1931) is very poorly exposed in the parcel and, as a result, no fossil remains were found during the field survey conducted in support of this evaluation. However, this rock unit has yielded fossilized bones and teeth representing a taxonomically diverse marine vertebrate fauna. A number of LACM fossil sites in the parcel vicinity have yielded the remains of a lanternfish, leatherback turtle, bird (shearwater), and a baleen whale (MacLeod 2004). Another fossil locality in Woodland Hills also yielded fossilized shark teeth and the fossilized shells of marine clams (scallops). Elsewhere in Los Angeles, the marine shale has yielded the fossilized fronds of marine algae (seaweed) and the fossilized tests of starfish (Lander 2000). The marine shale is comparatively productive throughout its area of exposure along the northern slope of the Santa Monica Mountains. These fossil occurrences indicate that there is a high potential for similar fossil remains, especially those of fishes, being encountered by earth-moving activities associated with development where the parcel is underlain by the marine shale.

Younger Alluvium

No fossil site is recorded from the younger alluvium in the parcel vicinity. Moreover, at and near the surface, this rock unit probably is too young to contain remains old enough to be considered fossilized. However, the younger alluvium has yielded the fossilized wood of trees, the fossilized shells of fresh-water snails and clams and land snails; and the fossilized bones and teeth of fresh-water fishes, frogs, lizards, snakes, shrews, rabbits, and rodents at the Metro Red Line Universal City Station, and fossilized wood at depths as shallower as 16 feet below the surface at the North Hollywood Station (Lander 2000). These fossil occurrences indicate that there is a moderate potential for similar fossil remains being encountered at depth by earth-moving activities (particularly trenching for pipelines) associated with development where the parcel is underlain by younger alluvium, but only a low potential at and near the surface.

Impacts and Mitigation

Direct Impacts

Earth-moving activities (particularly grading) associated with development of the parcel might result in the loss of paleontologic resources, including fossil remains, associated specimen data and corresponding geologic and geographic site data, and an undetermined number of fossil sites, particularly with regard to the unnamed marine shale, which has yielded fossil remains at a number of fossil sites in the parcel vicinity. Therefore, the impact of earth-moving activities on the paleontologic resources of the marine shale would be considered highly significant, but only moderately significant with regard to the younger alluvium at depth, and of low significance at and near the surface of the alluvium. However, mitigation would reduce the impact of the earth-moving activities on paleontologic resources to a less-than-insignificant level by allowing for the recovery of some of the fossil remains that might be exposed by these activities. Moreover, with mitigation, earth-moving activities would result in some beneficial effects, including the exposure of fossil remains that would not have been uncovered without these activities and, therefore, would not have been available for recovery.

Cumulative Impacts

Development of the parcel, in combination with the development of other parcels in Los Angeles where these parcels are underlain by the unnamed marine shale, would lead to the progressive loss of exposures of fossil-bearing strata in this rock unit that can be prospected for fossil remains and unrecorded fossil sites. Although mitigation would reduce the cumulative impact of development of the present parcel on paleontologic resources by allowing for the recovery of some fossil remains and associated data, the continued loss of paleontologic resources still would remain a potentially significant impact because, even with the substantial mitigation of direct impacts associated with development of the parcel, eventually there would be little or no exposure of these rock units available for future scientific investigation.

Mitigation Measures

The measures presented below are in compliance with Society of Vertebrate Paleontology (SVP 1995, 1996) measures for mitigating the adverse impact of construction on paleontologic resources, and for the museum repository acceptance of a mitigation program fossil collection. These measures would reduce the direct impact of earth-moving activities (particularly grading) on paleontologic resources to a less-than-significant level, and also would reduce the cumulative impact of these activities on paleontologic resources.

Task 1—Retention of Paleontologist.—Prior to construction, the services of a qualified vertebrate paleontologist approved by the LACM and the City of Los Angeles will be retained to implement a mitigation program during earth-moving activities associated with development of the parcel.

Task 2—Museum Storage Agreement.—The paleontologist will develop a formal agreement with a recognized museum repository, such as the LACM, regarding the final disposition and permanent storage and maintenance of any fossil remains, as well as the archiving of associated specimen data and corresponding geologic and geographic site data, that might be recovered as a result of the mitigation program, and the level of treatment (preparation, identification, curation, cataloguing) of the remains that would be required before the entire mitigation program fossil collection would be accepted by the repository for storage.

Task 3—Paleontologic Monitoring and Fossil/Sample Recovery.—Earth-moving activities (particularly grading of parcel and trenching for pipelines) will be monitored by a paleontologic construction monitor. Monitoring will include the inspection of fresh exposures created by grading of the unnamed marine shale and trenching in the younger alluvium to allow for the recovery of larger fossil remains, and periodically dry test screening trenching debris to allow for the recovery of smaller fossil remains. Monitoring will be conducted on a full-time basis in areas underlain by the marine shale, and on a half-time basis once trenching has reached a depth 5 feet below previous grade in areas underlain by younger alluvium. As soon as practicable, the monitor will recover all vertebrate fossil specimens, a representative sample of invertebrate or plant fossils, or any fossiliferous rock or sediment sample that can be recovered easily. As warranted, fossiliferous sediment samples will be recovered from the younger alluvium and processed to allow for the recovery of smaller fossil remains (total weight of samples will not

exceed 6,000 pounds). The location and proper geologic context of any fossil occurrence or sampling site will be documented, as necessary. The monitor will have the authority to divert grading temporarily around a fossil site until the fossil remains have been evaluated and, if warranted, the remains and/or a fossiliferous rock or sediment sample have been recovered.

Task 4—Final Laboratory Tasks.—All fossil specimens recovered from the parcel as a result of the mitigation program, including those recovered as the result of processing fossiliferous sediment samples, will be treated (prepared, identified, curated, catalogued) in accordance with designated museum repository requirements. As appropriate, a sample of the marine shale will be submitted to a commercial laboratory for microfossil analysis; a sample of fossilized bone, shell, or wood from the younger alluvium will be submitted for carbon-14-dating analysis; and/or a sample of the alluvium will be submitted for pollen analysis.

Task 5—Reporting.—The monitor will maintain daily monitoring logs that include the location where monitoring was conducted, the rock unit encountered, fossil specimens or samples recovered, and associated specimen or sample data and corresponding geologic and geographic site data. A final technical report of findings summarizing the results of the mitigation program will be prepared by the paleontologist. The report will be prepared in accordance with SVP and museum repository requirements.

Literature Cited

Dibblee, T.W., Jr. 1992. Geologic map of the Topanga and Canoga Park (south ½) Quadrangles, Los Angeles County, California. Dibblee Geological Foundation Map DF-35.

Hoots, H.W. 1931. Geology of the eastern part of the Santa Monica Mountains, Los Angeles County, California. United States Geological Survey Professional Paper 165C:1-134.

Lander, E.B. 2000. Los Angeles Metro Red Line project Segments 2 and 3—Paleontologic resource impact mitigation program final technical report of findings. Los Angeles County Metropolitan Transportation Authority.

McLeod, S.A. 2004. Paleontological resources for the proposed Woodland Hills - Mulholland initial study, project area. Natural History Museum of Los Angeles County Department of Vertebrate Paleontology. Prepared for Christopher A. Joseph & Associates.

Society of Vertebrate Paleontology. 1995. Assessment and mitigation of adverse impacts to nonrenewable paleontologic resources: Standard guidelines. Society of Vertebrate Paleontology News Bulletin 163:22-27.

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23 July 2004

Christopher A. Joseph & Associates
11849 West Olympic Boulevard, Suite 101
Los Angeles, CA 90064

Attn: Rebecca Shokrian, Assistant Environmental Planner

re: Paleontological resources for the proposed Woodland Hills - Mulholland Initial Study, project area

Dear Rebecca:

I have conducted a thorough search of our paleontology collection records for the locality and specimen data for the proposed Woodland Hills - Mulholland Initial Study, project area as outlined on the section of the Canoga Park USGS quadrangle map that you sent to me on 21 July 2004. We have no localities that lie directly within the boundaries of the proposed project area, but we do have localities nearby that occur in the same sedimentary rock units as found on the project property.

Most of the proposed project area has surface exposures of soil and terrestrial younger Quaternary Alluvium that are unlikely to contain significant fossil vertebrate remains, at least in the uppermost layers. We have no localities anywhere nearby from the younger Quaternary Alluvium. At relatively shallow depth below the Quaternary Alluvium, however, there are deposits of older terrestrial Quaternary sediments. Our closest fossil vertebrate locality in the older Quaternary sediments is LACM 1213, directly south of the proposed project area in a small valley just east of Mulholland Highway and west of Highway 27, that produced fossil specimens of horse, *Equus*, and ground sloth, *Paramylodon*. Our next closest locality in these deposits is LACM 5878, west-northwest of the proposed project area up Long Valley Road, where a skeleton of fossil mastodon, Mammutidae, was discovered.

Around the margins of the proposed project area, particularly on the eastern side, there are exposures of the marine Late Miocene Upper Modelo Formation that probably also underlies the Quaternary deposits in most of the proposed project area and that is well known to be fossiliferous. Our closest vertebrate fossil locality from the Upper Modelo Formation is LACM 5125, directly north of the proposed project area near San Feliciano Drive, where specimens of a fossil lanternfish, Myctophidae, were found. Other nearby fossil vertebrate localities in the Upper Modelo Formation include LACM 3173, west of Old Topanga Canyon Road west of the proposed project area, where

fossil shearwater, *Puffinus*, specimens were recovered, LACM 5657, southwest of the proposed project area east of Dry Canyon and the Old Topanga Canyon Road, that produced a fossil baleen whale, Mysticeti, and LACM 6021, just south of east of the proposed project area north of Mulholland Drive and east of Canoga Avenues, where a rare specimen of fossil leatherback turtle, *Psephophorus*, was recovered.

Following the Society of Vertebrate Paleontology guidelines for paleontological mitigation, the paleontological sensitivity of the area including the proposed project site is considered to be of moderate to high potential. Excavations in the uppermost soil and younger Quaternary Alluvium layers as exposed in most of the proposed area are unlikely to uncover significant vertebrate fossils, but deeper excavations into the underlying older Quaternary sediments may well encounter significant fossil vertebrate remains as will any excavations in the exposures or subsurface deposits of the Upper Modelo Formation. Therefore, any significant subsurface excavations below the younger Quaternary Alluvium or any excavations in the Upper Modelo Formation should be closely monitored to quickly and professionally recover any potential vertebrate fossils without impeding development. 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

Samuel A. McLeod, Ph.D.
Vertebrate Paleontology

enclosure: invoice