Appendix F Paleontological Resources Report

MEMORANDUM

To: Alison E. Rondone, Project Manager, PBS&J

From: George J. Burwasser, California Professional Geologist 7151, PBS&J

Date: Wednesday 07 October 2010

Project: Palm-Industrial Warehouse Project EIR - PBS&J Project Number D21331.00

Re: Update of Baseline Data for Palaeontological Resources: Palm Avenue and Industrial Avenue, San Bernardino, California

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Introduction

This memorandum brings the palaeontological analysis in Chapter 4.4 Cultural Resources of the Screencheck Environmental Impact Report (EIR) submitted in April 2008 up to date.

Documentation

Key Sources Consulted- Web Searches

- University of California Museum of Paleontology, available at http://bscit.berkeley.edu/ucmp/loc.shtml, online search # 934847, through UCMP Locality Search, 07 October 2010 by G. J. Burwasser, PG 7151
- American Museum of Natural History, Division of Paleontology, available at http://paleo.amnh.org/fossil/seek.html, online search through AMNH Advance Search, 07 October 2010 by G. J. Burwasser, PG 7151
- North American Mammalian Paleofaunal Database, online search through The Paleobiology Database, available at http://paleodb.org/cgi-bin/bridge.pl?user=Guest&action=displaySearchColls&type=view , 07 October 2010 by G. J. Burwasser, PG 7151
- San Bernardino County Museum Geology-Paleontology Collection, available at http://www.co.san-bernardino.ca.us/museum/, online search 07 October 2010 by G. J. Burwasser, PG 7151
- The City of San Bernardino (http://www.ci.san-bernardino.ca.us/) webpages for the Planning Division (http://www.ci.san-bernardino.ca.us/depts/community_development/planning/default.asp), Planning Division documents (http://www.ci.san-bernardino.ca.us/depts/community_development/planning/planning_documents.asp), Community Development Agendas (http://www.ci.san-bernardino.ca.us/depts/community_development/agendas/default.asp),and

Development Code (http://www.ci.san-bernardino.ca.us/depts/community_development/development_code.asp) were searched for information about updates to the City's General Plan since 2005 related to geology, soils, and mineral resources.

- The California Code of Regulations (http://government.westlaw.com/linkedslice/search/default.asp?tempinfo=find&RS=GVT1.0&VR=2.0&SP=CCR-1000), Governor's Office of Planning and Research "CEQAnet Database" (http://www.ceqanet.ca.gov/), and California Natural Resources Agency "California Environmental Resource Evaluation System" (http://ceres.ca.gov/ceqa/) were searched for information about updates to the California Environmental Quality Act (CEQA) since 2005 related to paleontological resources.

Research Results

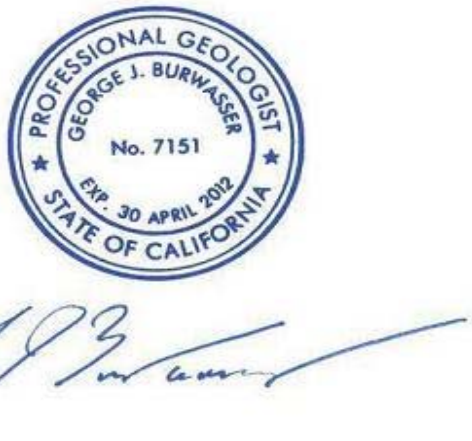
Review of the database searches revealed several new entries for San Bernardino County at the University of California Museum of Paleontology, the American Museum of Natural History, and in The Paleobiology Database. All the new entries were for sites in the Mojave Desert between Victorville and Baker, at least 30 miles north of the project site, and none were in the geologic formations found at the project site.

Review of the San Bernardino General Plan determined no new policies regarding paleontological resources were adopted that were not previously been considered in the April 2008 submittal of the DEIR.

Review of the CEQA requirements related to paleontological resources determined no changes have occurred that were not previously been considered in the April 2008 submittal of the EIR.

Conclusion

Paleontological resources conditions are essentially the same as they were at the time of the April 2008 submittal of the EIR. No text alterations are necessary at this time.


PROFESSIONAL GEOLOGIST
GEORGE J. BURWASSER
No. 7151
EXP. 30 APRIL 2012
STATE OF CALIFORNIA

MEMORANDUM

To: Alison E. Rondone, Project Manager, PBS&J

From: George J. Burwasser, California Registered Geologist 7151, PBS&J

Date: Wednesday 11 October 2007

Project: Palm-Industrial Warehouse Project EIR - PBS&J Project Number D21331.00

Re: Palaeontological Resources: Palm Avenue and Industrial Avenue, San Bernardino, California

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Introduction

Palaeontological resources, usually referred to collectively as fossils, are the remains or traces of prehistoric animals and plants. Palaeontology is the study of life in past geologic time based on fossil plants and animals. Fossils are important scientific and educational resources because of their use in documenting the presence and evolutionary history of particular groups of now-extinct organisms, reconstructing the environments in which those organisms lived, and determining the relative ages and geologic processes of the strata (sediment or rock layers) in which they occur. With few exceptions, fossils that are useful for these determinations are preserved in sedimentary rocks. Occasionally, rocks that have been metamorphosed (changed by heat or pressure), such as marble metamorphosed from limestone, retain fossil remnants which are identifiable, but not necessarily valuable for sedimentary age or process research.

Documentation

Key Sources Consulted

- Site Visit – August 9, 2007 by G. J. Burwasser, PG 7151
- References –Miller F. K., Matti, J. C., and S. E. Carson, *Geologic Map of the San Bernardino North 7.5' Quadrangle, San Bernardino County, California*, Open-File Report 01-131, Version 1.0, United States Geological Survey, digital preparation by P. M. Cossette, 2001

  – Morton, D. M. and F. K. Miller, *Geologic Map of the San Bernardino and Santa Ana 30' x 60' Quadrangles, California*, Open-File Report 2006-1217, Version 1.0, United States Geological Survey, digital preparation by P. M. Cossette and K. R. Bovard, 2006

  – *Assessment and Mitigation of Adverse Impacts to Nonrenewable Paleontologic Resources – Standard Guidelines*, Society of Vertebrate Paleontology Committee for Conformable Impact Mitigation Guidelines, Robert T. Reynolds, Chair, January 1995 Society of Vertebrate Paleontology News Bulletin, volume 163, pages 22 through 27

- Databases – Kleinfelder, Incorporated, Inferred Fossil Potential from the Jennings State-wide Geologic Unit Map, 2002, searched August 6, 2007 by G. J. Burwasser, PG 7151

  – University of California Museum of Paleontology, available at http://bscit.berkeley.edu/ucmp/loc.shtml, online search through UCMP Locality Search, August 6, 2007 by G. J. Burwasser, PG 7151

  – American Museum of Natural History, Division of Paleontology, available at http://paleo.amnh.org/fossil/seek.html, online search through AMNH Advance Search, August 6, 2007 by G. J. Burwasser, PG 7151

  – North American Mammalian Paleofaunal Database, available at http://www.nceas.ucsb.edu/~alroy/nampfd.html, online search through The Paleobiology Database, September 6, 2007 by G. J. Burwasser, PG 7151

  – San Bernardino County Museum Geology-Paleontology Collection, available at http://www.co.san-bernardino.ca.us/museum/, online search September 6, 2007 by G. J. Burwasser, PG 7151

Site Description

The Palm-Industrial Warehouse Project Site is in the San Bernardino North topographic quadrangle approximately 55 miles east of Los Angeles. The Project Site boundaries are the Riverside Freeway (Highway 15) on the north, Palm Avenue on the west, Industrial Parkway on the south, and a vacant lot on the east, in the City of San Bernardino, California. The Project Site contains about 33 acres of open land. The Project Site is mostly flat, with three small hills approximately along the longitudinal centerline of the site. The flat area slopes southeast at approximately a 4 percent grade from about 1685 feet above mean sea level (+1685 feet msl) to about +1640 feet msl. The largest central hill rises to about +1802 feet msl: the other two rise to about +1720 feet msl.

Regulatory Requirements

CEQA

There is no federal law that specifically protects natural or palaeontological resources: there are a number of laws that have been interpreted to do so, the primary one being the Antiquities Act of 1906 which protects historical or prehistoric ruins or monuments and objects of antiquity. This Act has been amended specifically to allow funding for palaeontological mitigation. Under California law, palaeontological resources are included in the California Environmental Quality Act (CEQA), California Administrative Code, Title 14, Section 4306 *et seq.*, and Public Resources Code Section 5097.5, and are required to be examined as part of the CEQA process.

Anticipated Permits

No permits related to palaeontological resources would be required for project implementation. If paleontological resources were discovered during excavation for project construction, the City could require the preparation of a detailed palaeontological resources study.

Agency Coordination

The amount of agency coordination would be dependent upon the actual project footprint and the depth of excavated for construction of the project. The City would need to be consulted if paleontological resources were discovered during excavation for project construction.

Categories of Palaeontological Sensitivity

Palaeontological sensitivity refers to the likelihood of finding significant fossils within a geologic formation.[1] In California, fossils of land-dwelling vertebrates are considered significant. Such fossils are found in river, lake, and bog deposits. The following levels of sensitivity recognize the important relationship between fossils and the geologic formations within which they are preserved.

- High Sensitivity – High sensitivity is assigned to geologic formations known to contain palaeontological localities with rare, well-preserved, and/or critical fossil materials for stratigraphic or palaeo-environmental interpretation, and fossils providing important information about the palaeo-biology and evolutionary history (phylogeny) of animal and plant groups. Generally speaking, highly sensitive formations are known to produce vertebrate fossil remains or are considered to have the potential to produce such remains.
- Moderate Sensitivity – Moderate sensitivity is assigned to geologic formations known to contain palaeontological localities with moderately preserved, common elsewhere, or stratigraphically long-ranging fossil material. The moderate sensitivity category also is applied to geologic formations that are judged to have a strong, but unproven potential for producing important fossil remains (e.g., Pre-Holocene sedimentary rock units representing low to moderate energy, of marine to non-marine depositional settings).
- Low Sensitivity – Low sensitivity is assigned to geologic formations that, based on their relative youthful age and/or high-energy depositional history, are judged unlikely to produce important fossil remains. Typically, low sensitivity formations may produce invertebrate fossil remains in low abundance.
- Marginal Sensitivity – Marginal sensitivity is assigned to geologic formations that are composed either of pyroclastic volcanic rocks or metasedimentary rocks, but which nevertheless have a limited probability for producing fossil remains from certain sedimentary lithologies at localized outcrops.

- Zero Sensitivity – Zero sensitivity is assigned to geologic formations that are entirely plutonic (volcanic rocks formed beneath the earth's surface) in origin and therefore have no potential for producing fossil remains.

Geologic Units

Numerous geologic studies have been conducted by the California and United States Geological Surveys of all or part of the San Bernardino North quadrangle. The most detailed description readily available for the sediment and rock types in the vicinity of the Project Site is in Miller et al. (2001). According to their map and report, the Project Site contains very young wash deposits (late Holocene epoch, less than 3,000 years old), part of a southeast-sloping alluvial plain formed by sediment aggradation from the combined stream flows of Cajon Wash and Cable Creek. The material is fine to coarse sand and pebbly sandy gravel with boulders. The deposit is at least 30 to 50 feet thick and is underlain by at least 150 feet of bouldery sand and gravel.[2] The soil on the flat portions of the Project Site developed on this unit is the Tujunga gravelly loamy sand. The hills are outcrops of the Pelona schist (Mesozoic era, probably between 165 million and 170 million years old) and are represented by the Friant-Rock Outcrop Complex.[3] The schist is metamorphosed sedimentary rock that retains none of its primary sedimentary structures and contains granitic intrusions.

Research Results

A Geographical Information System query of the Kleinfelder (2002) map was used initially to distinguish the potential types of fossil-bearing geologic units in the vicinity of the Project Site. As indicated in the list of sensitivity levels, the types of geologic units have a strong influence on the potential for a site to contain paleontological resources. The geologic sediments at the Project Site date from the middle to late part of the Holocene epoch, the youngest portion of the Quaternary period, and consist of unconsolidated sand and gravel deposited by relatively large rivers in an alluvial fan environment. Based on its youthful age and high-energy depositional history, this unit would be considered unlikely to contain important paleontological resources (vertebrate fossils) and would be assigned to the Low Sensitivity category. The metamorphic geologic unit at the Project Site has been subjected to heat and pressure for tens of millions of years and is assigned to the Marginal Sensitivity category with the granitic inclusions in the Zero Sensitivity category. Morton and Miller (2006) described the fossil content of each geologic unit in the vicinity of the Project Site and indicated no previously recorded fossil localities in the alluvial deposits. Subsequent searches of the palaeontological databases listed at the beginning of this memo confirmed the youngest fossil finds in any surface exposures within 10 miles of the Project Site were in deposits at least 11,000 years old, 8,000 years older than the alluvial unit at the Project Site. The >150-foot thick bouldery sand and gravel formation underlying the late Holocene alluvium at depths of 30 to 50 feet may be as young as

11,000 years and is unlikely to contain palaeontological resources because of its high-energy depositional history. No palaeontological resources were identified in the course of the field survey.

Potential Impacts

Once the hills have been removed from the Project Site, excavation would be limited to road bases, underground utilities, and building foundations and service cores, all of which would be no deeper than 5 to 15 feet below ground surface. The probability of encountering palaeontological resources in the hills at the Project Site is marginal to zero and in the flatland is low. Consequently, the potential for impacts to such resources is low.

Palaeontological Resource Mitigation Measures

No mitigation measures are proposed.

Conclusion

No palaeontological resources are expected to occur at the Palm-Industrial Warehouse Project Site because the sediment and rock underlying the site are unlikely to be fossil-bearing.

Recommendation

Because it is unlikely that any palaeontological resources exist at the Project Site, no further action regarding the recovery or documentation of palaeontological resources is recommended.

[1] 'Geologic formation' refers to the types of rock or sediment present in a given area.

[2] Miller, R.V., Anderson, *Mineral Land Classification of the Greater Los Angeles Area, Part IV: Classification of Sand and Gravel Resource Areas, San Bernardino Production — Consumption Region,* California Geological Survey (formerly the Division of Mines and Geology), Special Report 143, Part VII, 1987, pages 9, 11, 14, plates 7.43 and 7.44

[3] United States Department of Agriculture, Natural Resources Conservation Service, *Soil Survey of San Bernardino County, Southwestern Part, California*, G.A. Woodruff, Party Chief, Washington, D.C., 1980, Version 3, updated online January 4, 2007, at http://websoilsurvey.nrcs.usda.gov/app/WebSoilSurvey.aspx, accessed August 13, 2007