PALEONTOLOGICAL RESOURCES ASSESSMENT REPORT

BREW HARLEY KNOX INDUSTRIAL PROJECT

Assessor's Parcel Number 302-090-021
City of Perris, Riverside County, California

For Submittal to:

City of Perris
Development Services Department, Planning Division
101 North D Street
Perris, CA 92570

Prepared for:

MIG, Inc.
1650 Spruce Street, Suite 106
Riverside, CA 92507

Prepared by:

Deirdre Encarnación, Paleontologist/Report Writer
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CRM TECH
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Bai "Tom" Tang, Principal Investigator
Michael Hogan, Principal Investigator

July 11, 2023

MIG Project No. 13792.00
CRM TECH Project No. 3995P
USGS Perris, Calif., 7.5' (1:24,000) quadrangle
Section 6, T4S R4W, San Bernardino Baseline and Meridian

EXECUTIVE SUMMARY

Between March and July 2023, at the request of MIG, Inc., CRM TECH performed a paleontological resource assessment on approximately four acres of vacant land in the City of Perris, Riverside County, California. The subject property of the study, Assessor's Parcel Number 302-090-021, is located on the south side of Harley Knox Boulevard between Perris Boulevard and Indian Street, in the northeast quarter of Section 6, Township 4 South, Range 4 West, San Bernardino Baseline and Meridian, as depicted in the United States Geological Survey Perris, California, 7.5' quadrangle.

The study is part of the environmental review process for the proposed Brew Harley Knox Industrial Project, which entails primarily the construction of an approximately 59,974-square-foot warehouse on the property. The City of Perris, as the lead agency for the project, required the study in compliance with the California Environmental Quality Act (CEQA). The purpose of the study is to provide the City with the necessary information and analysis to determine whether the proposed project would adversely affect any significant, nonrenewable paleontological resources, as required by CEQA, and to design a paleontological mitigation program if necessary.

In order to identify any paleontological resource localities that may exist in or near the project area and to assess the probability for such resources to be encountered during the project, CRM TECH initiated a records search at the appropriate repository, conducted a literature review, and carried out a systematic field survey of the project area. While no paleontological localities have been identified in the immediate vicinity of the project location, the results of these research procedures suggest that the proposed project's potential to impact significant, nonrenewable paleontological resources appears to be low in the previously disturbed surface and near-surface soils of Holocene age but high in the subsurface deposits of older Pleistocene alluvial sediments. Therefore, CRM TECH recommends that a paleontological resource impact mitigation program be developed and implemented during the project to prevent impacts on such resources or reduce them to a level less than significant.

As the primary component of the mitigation program, all earth-moving operations impacting relatively undisturbed soils in the project area beyond the depth of three feet should be monitored periodically by a qualified paleontological monitor to identify potentially fossil-bearing sediments when they are encountered, at which time continuous monitoring will become necessary. Samples of sediment should be collected and processed to recover small fossils, and all fossil remains should be identified and curated at a repository with permanent retrievable storage. Under these conditions, CRM TECH further recommends that the project may be cleared to proceed in compliance with CEQA provisions on paleontological resources.

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INTRODUCTION

Between March and June 2023, at the request of MIG, Inc., CRM TECH performed a paleontological resource assessment on approximately four acres of vacant land in the City of Perris, Riverside County, California (Fig. 1). The subject property of the study, Assessor's Parcel Number 302-090-021, is located on the south side of Harley Knox Boulevard between Perris Boulevard and Indian Street, in the northeast quarter of Section 6, Township 4 South, Range 4 West, San Bernardino Baseline and Meridian, as depicted in the United States Geological Survey (USGS) Perris, California, 7.5' quadrangle (Figs. 2, 3).

The study is part of the environmental review process for the proposed Brew Harley Knox Industrial Project, which entails primarily the construction of an approximately 59,974-square-foot warehouse on the property. The City of Perris, as the lead agency for the project, required the study in compliance with the California Environmental Quality Act (CEQA; PRC §21000, et seq.). The purpose of the study is to provide the City with the necessary information and analysis to determine whether the proposed project would adversely affect any significant, nonrenewable paleontological resources, as required by CEQA, and to design a paleontological mitigation program if necessary.

In order to identify any paleontological resource localities that may exist in or near the project area and to assess the probability for such resources to be encountered during the project, CRM TECH initiated a records search at the appropriate repository, conducted a literature review, and carried out a systematic field survey of the project area. The following report is a complete account of the methods, results, and final conclusion of this study. Personnel who participated in the study are named in the appropriate sections below, and their qualifications are provided in Appendix 1.

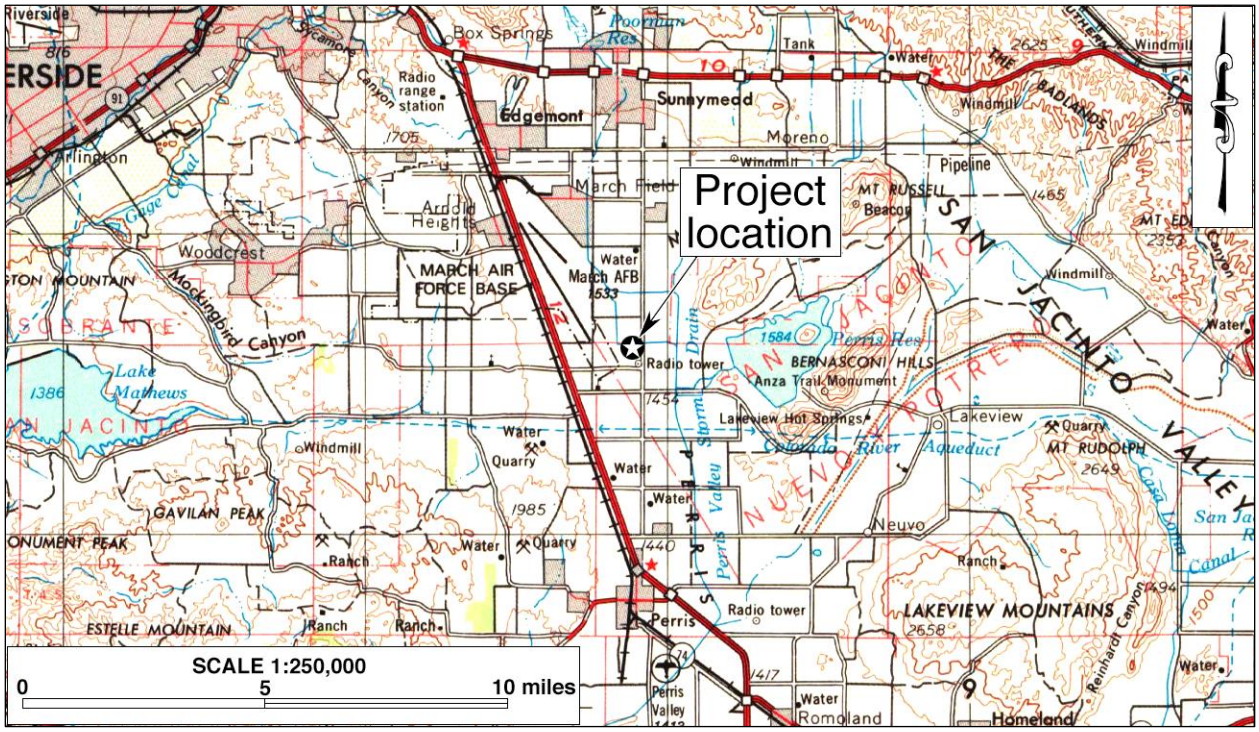

Figure 1. Project vicinity. (Based on USGS Santa Ana, Calif., 120'x60' quadrangle, 1979 edition)

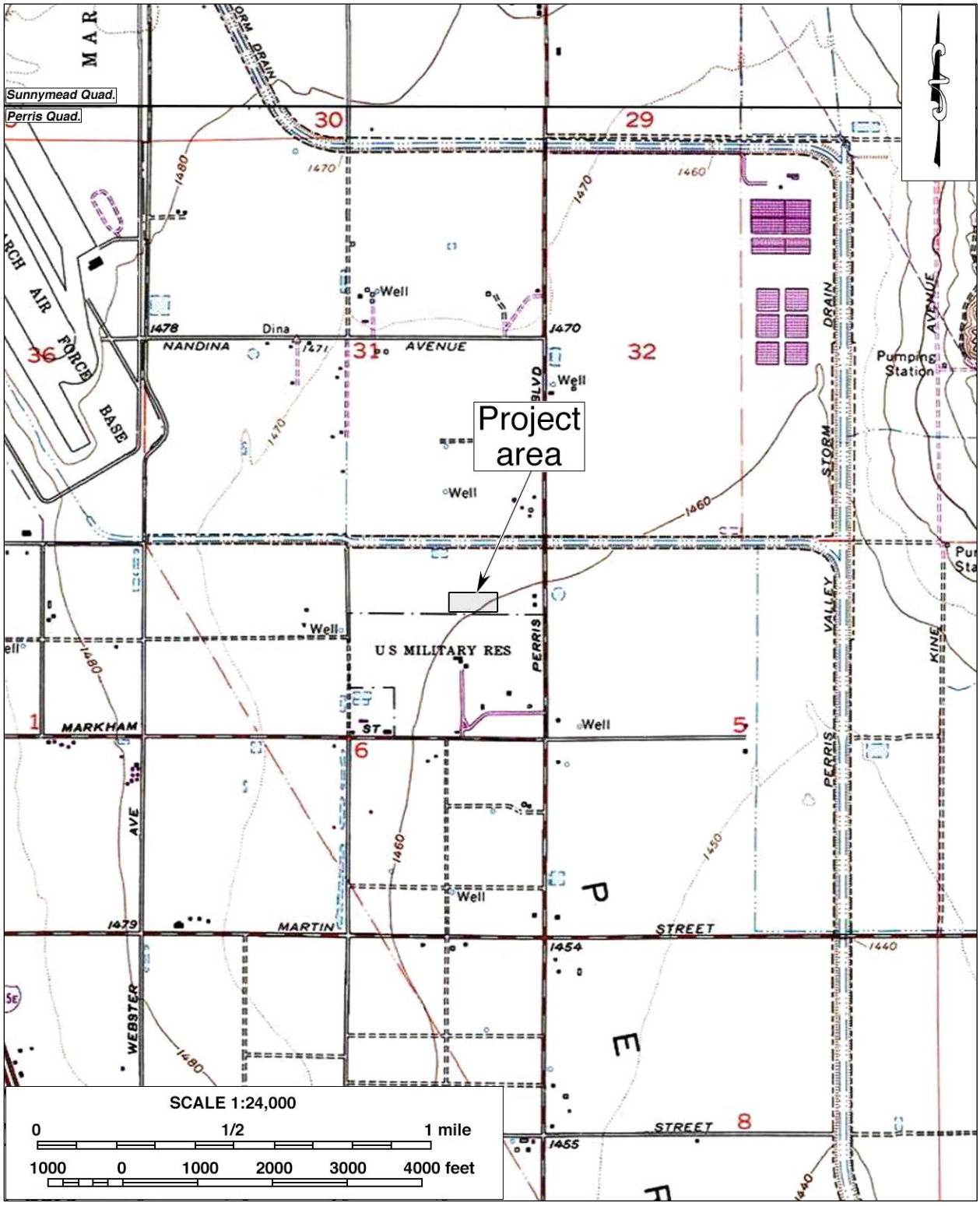

Figure 2. Project location. (Based on USGS Perris and Sunnymead, Calif., 7.5' quadrangles, 1978/1980 edition)

Figure 3. Aerial image of the project area.

PALEONTOLOGICAL RESOURCES

DEFINITION

Paleontological resources represent the remains of prehistoric life, exclusive of any human remains, and include the localities where fossils were collected as well as the sedimentary rock formations in which they were found. The defining character of fossils or fossil deposits is their geologic age, typically older than recorded human history and/or older than the middle Holocene Epoch, which dates to circa 5,000 radiocarbon years (Society of Vertebrate Paleontology 2010:11).

Common fossil remains include marine and freshwater mollusk shells; the bones and teeth of fish, amphibians, reptiles, and mammals; leaf imprint assemblages; and petrified wood. Fossil traces, another type of paleontological resource, include internal and external molds (impressions) and casts created by these organisms. These items can serve as important guides to the age of the rocks and sediments in which they are contained, and may prove useful in determining the temporal relationships between rock deposits from one area and those from another as well as the timing of geologic events. They can also provide information regarding evolutionary relationships, development trends, and environmental conditions.

Fossil resources generally occur only in areas of sedimentary rock (e.g., sandstone, siltstone, mudstone, claystone, or shale). Because of the infrequency of fossil preservation, fossils, particularly vertebrate fossils, are considered nonrenewable paleontological resources. Occasionally fossils may be exposed at the surface through the process of natural erosion or because of human disturbances; however, they generally lay buried beneath the surficial soils. Thus, the absence of fossils on the surface does not preclude the possibility of their being present within subsurface deposits, while the presence of fossils at the surface is often a good indication that more remains may be found in the subsurface.

SIGNIFICANCE CRITERIA

According to guidelines proposed by Scott and Springer (2003), paleontological resources can be considered to be of significant scientific interest if they meet one or more of the following criteria:

1. The fossils provide information on the evolutionary relationships and developmental trends exhibited among organisms, living or extinct;
2. The fossils provide data useful in determining the age(s) of the rock unit or sedimentary stratum, including data important in determining the depositional history of the region and the timing of geologic events therein;
3. The fossils provide data regarding the development of biological communities or the interactions between paleobotanical and paleozoological biota;
4. The fossils demonstrate unusual or spectacular circumstances in the history of life; and/or
5. The fossils are in short supply and/or in danger of being depleted or destroyed by the elements, vandalism, or commercial exploitation, and are not found in other geographic locations.

PALEONTOLOGICAL SENSITIVITY

The fossil record is unpredictable, and the preservation of organic remains is rare, requiring a particular sequence of events involving physical and biological factors. Skeletal tissue with a high percentage of mineral matter is the most readily preserved within the fossil record; soft tissues not intimately connected with the skeletal parts, however, are the least likely to be preserved (Raup and Stanley 1978). For this reason, the fossil record contains a biased selection not only of the types of organisms preserved but also of certain parts of the organisms themselves. As a consequence, paleontologists are unable to know with certainty, the quantity of fossils or the quality of their preservation that might be present within any given geologic unit.

Sedimentary units that are paleontologically sensitive are those geologic units (mappable rock formations) with a high potential to contain significant nonrenewable paleontological resources. More specifically, these are geologic units within which vertebrate fossils or significant invertebrate fossils have been determined by previous studies to be present or are likely to be present. These units include, but are not limited to, sedimentary formations that contain significant paleontological resources anywhere within their geographical extent as well as sedimentary rock units temporally or lithologically amenable to the preservation of fossils.

A geologic formation is defined as a stratigraphic unit identified by its lithic characteristics (e.g., grain size, texture, color, and mineral content) and stratigraphic position. There is a direct relationship between fossils and the geologic formations within which they are enclosed and, with sufficient knowledge of the geology and stratigraphy of a particular area, it is possible for paleontologists to reasonably determine the formation's potential to contain significant nonrenewable vertebrate, invertebrate, marine, or plant fossil remains.

The paleontological sensitivity for a geologic formation is determined by the potential for that formation to produce significant nonrenewable fossils. This determination is based on what fossil resources the particular geologic formation has produced in the past at other nearby locations. Determinations of paleontologic sensitivity must consider not only the potential for yielding vertebrate fossils but also the potential of yielding a few significant fossils that may provide new and significant taxonomic, phylogenetic, and/or stratigraphic data.

The Society of Vertebrate Paleontology issued a set of standard guidelines intended to assist paleontologists to assess and mitigate any adverse effects/impacts to nonrenewable paleontological resources. The guidelines defined four categories of paleontological sensitivity for geologic units that might be impacted by a proposed project, as listed below (Society of Vertebrate Paleontology 2010:1-2):

- **High Potential**: Rock units from which vertebrate or significant invertebrate, plant, or trace fossils have been recovered.
- **Undetermined Potential**: Rock units for which little information is available concerning their paleontological content, geologic age, and depositional environment.
- **Low Potential**: Rock units that are poorly represented by fossil specimens in institutional collections, or based on general scientific consensus only preserve fossils in rare circumstances.
- **No Potential**: Rock units that have no potential to contain significant paleontological resources, such as high-grade metamorphic rocks and plutonic igneous rocks.

SETTING

The City of Perris lies in the northern portion of the Peninsular Ranges Province, which is bounded on the north by the Transverse Ranges Province, on the northeast by the Colorado Desert Province, and on the west by the Pacific Ocean (Jenkins 1980:40-41; Harms 1996:131). Extending southward to the southern tip of Baja California, the Peninsular Ranges Province is made up of a series of northwest-southeast trending structural blocks consisting of uplifted mountains that are separated by valley basins that have developed along the intervening fault zones (Jahns 1954:Plate 3; Harden 2004:465).

The mountains are made up mainly of igneous intrusive rocks, metasedimentary rocks, and some metavolcanic rocks (Harden 2004:466-468). The non-crystalline rocks in the western portion of the mountains consist of both metavolcanic and metasedimentary rocks that are mainly of Mesozoic age, while the eastern portion contains mainly metasedimentary rocks of Paleozoic and older age (*ibid*. 471-472). The crystalline basement rocks are present in both the western and the eastern portions and consist mainly of Mesozoic-age granitic rocks with some scattered gabbroic intrusions (*ibid*. 466-468).

The project area is located in the western portion of the Perris Valley, one of the many tectonically controlled valleys within the valley-and-ridge systems in the Perris Block, and a few miles from an outcropping of basement rocks that form part of Mount Russell near the Perris Reservoir to the east. Lying between the San Jacinto and Elsinore-Chino fault zones (English 1926), the Perris Block is considered to have been active since Pliocene time (Woodford et al. 1971:3421). Colluvial/alluvial sediments of varying thickness derived from the erosion of the elevated portions of the region cover the low-lying areas of the block, which are filled with nonmarine sediments of upper Pliocene through Recent ages (Mann 1955:Plate 1; Kennedy 1977:5), and the ridges are composed of plutonic igneous rocks, metasedimentary rocks, and late-stage intrusive dikes.

The project area is part of a formerly agrarian area on the northern edge of the Perris city limits that has been undergoing rapid transformation into an industrial park over the past two decades (Google Earth 2005-2023). It encompasses a rectangular-shaped parcel of former agricultural land surrounded by recently constructed warehouses. The elevation of this location is roughly 1,460 feet above mean sea level. The terrain is generally level, and the surface soils are composed of tan-brown to red-brown clayey silt with little to no gravel or cobbles. The ground surface has been disturbed by past agricultural use and recent ripping of the surface soils, but all visible sediments appear to be homogenous. In its native state, the vegetation community in the project vicinity would be coastal sage scrub, but the agricultural use of this property has eliminated all signs of native vegetation with only foxtails and other small ruderal grasses present on the surface today (Fig. 4).

METHODS AND PROCEDURES

RECORDS SEARCH

The records search service for this study was provided by the Western Science Center (WSC) in Hemet. California, which is one of the local institutions that maintain files on regional

Figure 4. Overview of the current natural setting of the project area. (Photograph taken on May 18, 2023; view to the northeast)

paleontological localities as well as supporting maps and documents. The records search results were used to identify previously completed paleontological resource assessments as well as known paleontological localities within a one-mile radius of the project area.

LITERATURE REVIEW

In conjunction with the records searches, CRM TECH paleontologist Deirdre Encarnación pursued a literature review on the project area under the direction of principal paleontologist Ron Schmidtling. Sources consulted during the review include primarily topographic, geologic, and soil maps of the Perris area, published geologic literature pertaining to the project location, preliminary paleontological sensitivity assessment by the general plans of the County of Riverside and the City of Perris, aerial and satellite images available at the Nationwide Environmental Title Research (NETR) Online website and through the Google Earth software, and other materials in the CRM TECH library, including unpublished reports produced during similar surveys in the vicinity.

FIELD SURVEY

On May 18, 2023, CRM TECH crew chief Hunter O'Donnell and paleontological surveyor Alondra Garcia carried out the field survey of the project area. The survey was completed on foot at an

intensive level by walking a series of parallel north-south transects at 15-meter (approximately 50-foot) intervals. In this way, the ground surface in the entire project area was systematically examined to determine soil types, verify the geological formations, and search for indications of paleontological remains. Ground visibility was generally poor (approximately 30-50%) due to the vegetative cover. In light of the extent of past ground disturbances in the project area, the visibility is considered adequate for the survey effort.

RESULTS AND FINDINGS

RECORDS SEARCH

The records search by the WSC identified no known paleontological localities within the project area or a one-mile radius (Stoneburg 2023; see Appendix 2). According to the WSC, the soils in the project area consist primarily of alluvial sand and clay deposits from the Holocene Epoch (*ibid*.). Although these soils have a high preservation value, the preserved materials are not likely to represent fossil remains based on their relatively recent date of deposition. If development requires substantial excavation depths, however, there would be an increased likelihood of impacting Pleistocene-age alluvial sediments, which are known to be fossiliferous (*ibid*.).

The WSC notes that the presence of fossil material in near-surface soils is unlikely but further states that any fossil specimen discovered at depth in the project vicinity would be considered scientifically significant (Stoneburg 2023). Based on this assessment, the WSC recommends that caution be observed during development activities within the project area (*ibid.*).

LITERATURE REVIEW

The surface geology within the project area was mapped by Rogers (1965) as *Qal*, or alluvium of Holocene age. This is the same material mapped as the surface material in the Domenigoni Valley, the site of important vertebrate paleontological finds in recent decades (Springer and Scott 1994:47A; Springer et al. 1998:79A; Springer et al. 1999:77A). Most of these fossil remains were recovered from depths greater than 10 feet below the surface, unearthed because of the deep excavation required for a major reservoir construction, which is much deeper than normally required for typical real estate development projects except in such case as deep cuts for utility installation.

More recently, Morton (2003) mapped the surface geology in the project area as entirely $Qvof_a$ (Fig. 5), namely alluvial fan deposits of early to middle Pleistocene age, which is well-known for their paleontological sensitivity. Correspondingly, the County of Riverside's paleontological sensitivity map classifies the project location as high sensitivity ("High B"; RCIT n.d.).

> High B is a sensitivity equivalent to High A, but is based on the occurrence of fossils at a specified depth below the surface. This category indicates fossils that are likely to be encountered at or below 4 feet of depth and may be impacted during construction activities. (County of Riverside 2015:4.9-11).

Similarly, the City of Perris General Plan identifies the project area as a part of Area No. 1, which is defined as Pleistocene-aged older valley sediments and is considered to be of high sensitivity for paleontological resources (City of Perris 2008:Exhibit CN-7).

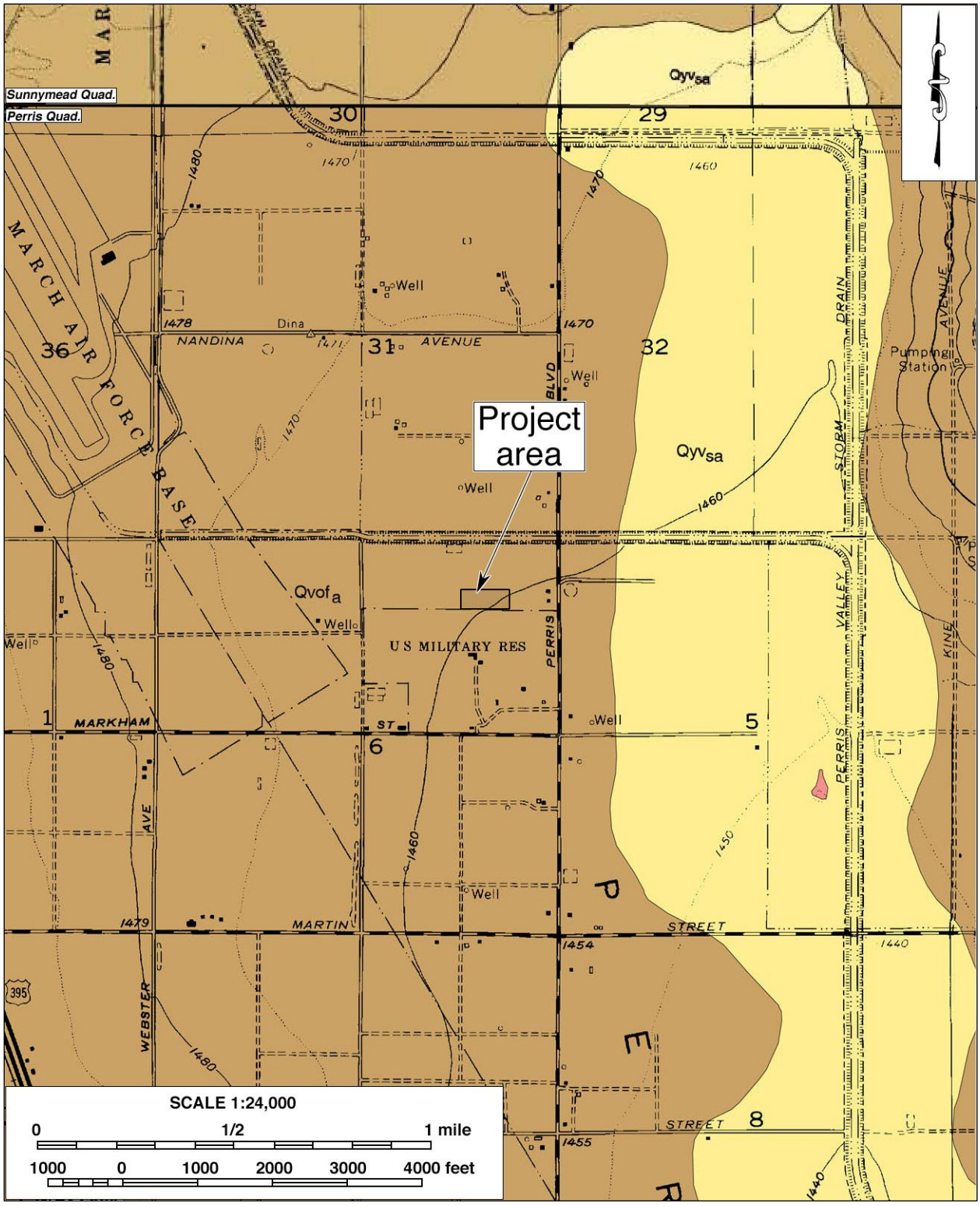

Figure 5. Geologic map of the project vicinity. (Based on Morton and Matti 2001 and Morton 2003)

FIELD SURVEY

Throughout the course of the field survey, no notable surface manifestation of any paleontological remains was observed within the project area. While surface visibility was somewhat limited by the presence of vegetative ground cover, in light of past agricultural operations, evidence of grading and clearing on the property, and the resulting ground disturbance, no intact fossil remains had been anticipated on the surface or in shallow deposits prior to the survey.

DISCUSSION

The results of the records search and the literature review indicate a consensus among recent studies that the project area is situated upon exposures of alluvium of Holocene age, which is not considered paleontologically sensitive. Furthermore, past agricultural activities and earth-moving operations have left the surface sediments extensively disturbed. However, these surface sediments sit on top of Pleistocene-age alluvium, which has a high potential to contain significant, nonrenewable fossil remains, especially in undisturbed subsurface sediments, and are known to have yielded significant fossils elsewhere in Riverside County. Based on the presence of Pleistocene sediments at unknown depth, the County of Riverside categorizes the property in the "High B" category of paleontological sensitivity. Further earth-moving operation at depth, therefore, may potentially disrupt or adversely affect paleontological resources.

CONCLUSION AND RECOMMENDATIONS

CEQA guidelines (Title 14 CCR App. G, Sec. V(c)) require that public agencies in the State of California determine whether a proposed project would "directly or indirectly destroy a unique paleontological resource" during the environmental review process. The present study, conducted in compliance with this provision, is designed to identify any significant, non-renewable paleontological resources that may exist within or adjacent to the project area, and to assess the possibility for such resources to be encountered in future excavation and construction activities.

Based on the research results presented above, the proposed project's potential to impact significant, nonrenewable paleontological resources is low in the previously disturbed surface and near-surface soils of Holocene age but high in the subsurface deposits of older Pleistocene alluvial sediments. Therefore, CRM TECH recommends that a paleontological resource impact mitigation program be developed and implemented during the project to prevent impacts on such resources or reduce them to a level less than significant. The mitigation program should be formulated in accordance with the provisions of CEQA (Scott and Springer 2003) as well as the proposed guidelines of the Society of Vertebrate Paleontology (2010), and should include but not be limited to the following components:

- All earth-moving operations within the project area reaching beyond the depth of three feet below the current ground surface should be monitored periodically by a qualified paleontological monitor to identify potentially fossil-bearing sediments when they are encountered, at which time continuous monitoring will become necessary. The monitor should be prepared to quickly salvage fossils as they are unearthed to avoid construction delays and should collect samples of

sediments that are likely to contain fossil remains of small vertebrates or in vertebrates. However, the monitor must have the power to temporarily halt or divert grading equipment to allow for the removal of abundant or large specimens.

- Samples of sediment should be collected and processed to recover small fossils, and all fossil remains should be identified and curated at a repository with permanent retrievable storage.
- A report of findings, including an itemized inventory of recovered specimens, should be prepared upon completion of the procedures outlined above. The report should include a discussion of the significance of the paleontological findings, if any. The report and the inventory, when submitted to the City of Perris, would signify completion of the program to mitigate potential impacts on paleontological resources.

Under these conditions, CRM TECH further recommends that the proposed project may be cleared to proceed in compliance with CEQA provisions on paleontological resources.

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APPENDIX 1

PERSONNEL QUALIFICATIONS

PROJECT PALEONTOLOGIST/REPORT WRITER
Deirdre Encarnación, M.A.

Education

2003	M.A., Anthropology, San Diego State University, California.
2000	B.A., Anthropology, minor in Biology, with honors; San Diego State University, California.
2021	Certificate of Specialization, Kumeyaay Studies, Cuyamaca College, California.
2001	Archaeological Field School, San Diego State University.
2000	Archaeological Field School, San Diego State University.

Professional Experience

2004-	Project Archaeologist/Report Writer, CRM TECH, Riverside/Colton, California.
2016-	Archaeological Consultant, Friends of Maha'ulepu, Koloa, Hawai'i.
2001-2003	Part-time Lecturer, San Diego State University, California.
2001	Research Assistant for Dr. Lynn Gamble, San Diego State University.
2001	Archaeological Collection Catalog, SDSU Foundation.

PROJECT PALEONTOLOGIST
Hunter C. O'Donnell, B.A.

Education

2016-	M.A. Program, Applied Archaeology, California State University, San Bernardino.
2015	B.A. (*cum laude*), Anthropology, California State University, San Bernardino.
2012	A.A., Social and Behavioral Sciences, Mt. San Antonio College, Walnut, California.
2011	A.A., Natural Sciences and Mathematics, Mt. San Antonio College, Walnut, California.
2014	Archaeological Field School, Santa Rosa Mountains; supervised by Bill Sapp of the United States Forest Service and Daniel McCarthy of the San Manuel Band of Mission Indians.

Professional Experience

2017-	Project Archaeologist, CRM TECH, Colton, California.
2016-2018	Graduate Research Assistant, Applied Archaeology, California State University, San Bernardino.
2016-2017	Cultural Intern, Cultural Department, Pechanga Band of Luiseño Indians, Temecula, California.
2015	Archaeological Intern, U.S. Bureau of Land Management, Barstow, California.
2015	Peer Research Consultant: African Archaeology, California State University, San Bernardino.

RON SCHMIDTLING, M.S.
Principal Paleontologist

Education

1995	M.S., Geology, University of California, Los Angeles.
1991	Pasadena City College, Pasadena, California.
1985	B.A., Archaeology, Paleontology, Ancient Folklore, and Art History, University of Southern Mississippi, Hattiesburg.

Professional Experience:

2020-	Principal Paleontologist, CRM TECH, Colton, California.
2014-	Instructor of Earth Science, History of Life, Ecology, and Evolutionary Biology, Columbia College Hollywood, Reseda, California.
2013, 2015	Volunteer, excavation of a camarasaur and a diplodocid in southern Utah, Natural History Museum of Los Angeles County, California.
1993-2014	Consultant, Getty Conservation Institute, Brentwood, California.

- Geological Consultant on the Renaissance Bronze Project, characterizing constituents of bronze core material;
- Paleontological Consultant for Antiquities/Conservation, identifying the foraminifera and mineral constituents of a limestone torso of Aphrodite;
- Scientific Consultant on the Brentwood Site Building Project, testing building materials for their suitability in the museum galleries.

1999-2001	Archaeological and Paleontological Monitor, Michael Brandman Associates, Irvine, California.
1997	Department of Archaeology, University of California, Los Angeles.
1994	Scientific Illustrator and Teaching Assistant, Department of Earth and Space Sciences and Department of Biological Sciences, University of California, Los Angeles.

Memberships

AAPS (Association of Applied Paleontological Sciences), USA; CSEOL (Center for the Study of Evolution and the Origin of Life), Department of Earth Sciences, University of California, Los Angeles.

Publications and Reports

Author, co-author, and contributor on numerous paleontological publications and paleontological resource management reports.

APPENDIX 2

RECORDS SEARCH RESULTS

WESTERN SCIENCE CENTER

April 28th, 2023

CRM Tech
Nina Gallardo
1016 E. Cooley Drive, Suite A/B
Colton, CA 92324

Dear Ms. Gallardo,

This letter presents the results of a record search conducted for the Proposed Brew Harley Knox-Perris Project in the City of Perris, Riverside County, CA. The project area is located south of Harley Knox Blvd, north of W. Markham Street, west of N. Perris Blvd, and east of Indian Avenue on Township 4 South, Range 4 West, Section 6 on the *Perris, CA* USGS 7.5 minute quadrangle.

The geologic units underlying this project are mapped primarily as alluvial sand and clay from the Holocene epoch (Dibblee and Minch 2003). Holocene alluvial units are considered to be of high preservation value, but material found is unlikely to be fossil material due to the relatively modern associated dates of the deposits. However, if development requires any substantial depth of disturbance, the likelihood of reaching Pleistocene alluvial sediments would increase. The Western Science Center does not have localities within the project area or within a 1 mile radius.

While the presence of any fossil material is unlikely, if excavation activity disturbs deeper sediment dating to the earliest parts of the Holocene or Late Pleistocene periods, the material would be scientifically significant. Excavation activity associated with the development of the project area is unlikely to be paleontologically sensitive, but caution during development should be observed.

If you have any questions, or would like further information, please feel free to contact me at bstoneburg@westerncentermuseum.org.

Sincerely,

Brittney Elizabeth Stoneburg, MSc
Collections Manager