PALEONTOLOGICAL RESOURCES ASSESSMENT REPORT

CHIPT CITRUS-BOYLE WAREHOUSE PROJECT

Assessor's Parcel Numbers 0251-151-03 to -07, -09, -10, -14 to -16, -18 to -22, and -39 to -44
City of Fontana, San Bernardino County, California

For Submittal to:

Planning Division
Department of Community Development
City of Fontana
8353 Sierra Avenue
Fontana, CA 92335

Prepared for:

MIG, Inc.
1650 Spruce Street, Suite 102
Riverside, CA 92507

Prepared by:

Ron Schmidtling, Principal Paleontologist
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Michael Hogan, Principal Investigator
Bai "Tom" Tang, Principal Investigator

September 18, 2023

CRM TECH Project No. 3903P
Approximately 15.44 acres
Fontana, Calif., 7.5' quadrangle; Section 19, T1S R5W, SBBM

EXECUTIVE SUMMARY

Between June 2022 and September 2023, at the request of MIG, Inc., CRM TECH performed a paleontological resources assessment on approximately 15.44 acres of partially developed rural land in the southern portion of the City of Fontana, San Bernardino County, California. The subject property of the study encompasses Assessor's Parcel Numbers 0251-151-03 to -07, -09, -10, -14 to -16, -18 to -22, and -39 to -44. These 21 contiguous parcels are located east of Citrus Avenue and between Slover Avenue and Boyle Avenue, in the southwest quarter of Section 19, T1S R5W, San Bernardino Baseline and Meridian.

The study is part of the environmental review process for the proposed CHIPT Citrus-Boyle Warehouse Project, which entails primarily the construction of two commercial warehouses measuring approximately 126,537 square feet and 167,588 square feet, respectively. The City of Fontana, 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 potentially disrupt or adversely affect any significant, nonrenewable paleontological resources, as mandated by CEQA.

In order to identify any paleontological resource localities that may exist in or near the project area and to assess the possibility for such resources to be encountered in future excavation and construction activities, CRM TECH initiated a records search at the appropriate repository, conducted a literature search, and carried out systematic field surveys of the project area, in accordance with the guidelines of the Society of Vertebrate Paleontology. Based on the findings from these research procedures, the proposed project's potential to impact significant paleontological resources is determined to be low for the Holocene-age surface sediments but high for the undisturbed Pleistocene-age sediments at depth.

Therefore, CRM TECH recommends that a paleontological resource impact mitigation program be developed and implemented during the project to prevent impacts on significant, nonrenewable paleontological resources or to reduce such impacts to a level less than significant. As the primary component of the mitigation program, periodic monitoring of earth-moving activities for evidence of significant, nonrenewable paleontological resources is recommended from the onset of earth-moving operations for the project, and continuous monitoring is recommended once excavations have reached the depth of five feet, or if older sediments are encountered at lesser depth.

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INTRODUCTION

Between June 2022 and September 2023, at the request of MIG, Inc., CRM TECH performed a paleontological resources assessment on approximately 15.44 acres of partially developed rural land in the southern portion of the City of Fontana, San Bernardino County, California (Fig. 1). The subject property of the study encompasses Assessor's Parcel Numbers 0251-151-03 to -07, -09, -10, -14 to -16, -18 to -22, and -39 to -44. These 21 contiguous parcels are located east of Citrus Avenue and between Slover Avenue and Boyle Avenue, in the southwest quarter of Section 19, T1S R5W, San Bernardino Baseline and Meridian (Figs. 2, 3).

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In order to identify any paleontological resource localities that may exist in or near the project area and to assess the possibility for such resources to be encountered in future excavation and construction activities, CRM TECH initiated a records search at the appropriate repository, reviewed pertinent geological literature, and carried out systematic field surveys on the project area. The following report is a complete account of these research procedures and the conclusion of the study. Personnel who participated in the study are named in the appropriate sections below, and their qualifications are provided in Appendix 1.

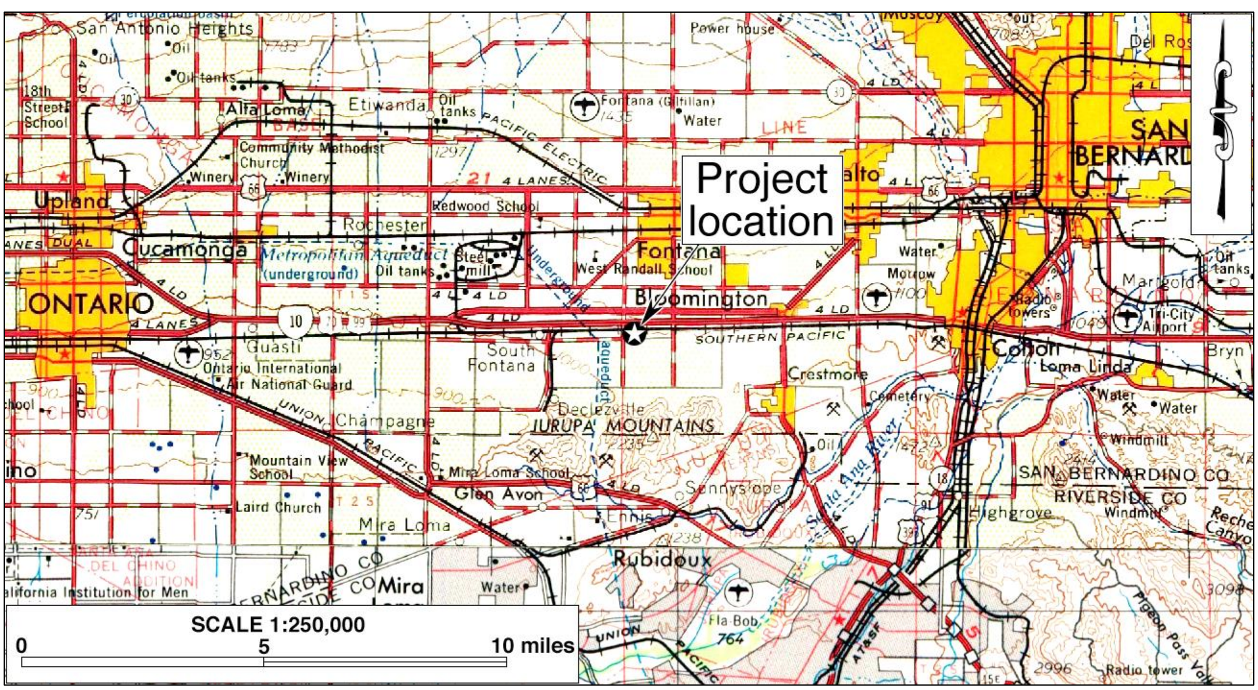

Figure 1. Project vicinity. (Based on USGS San Bernardino, Calif., 120'x60' quadrangle, 1969 edition)

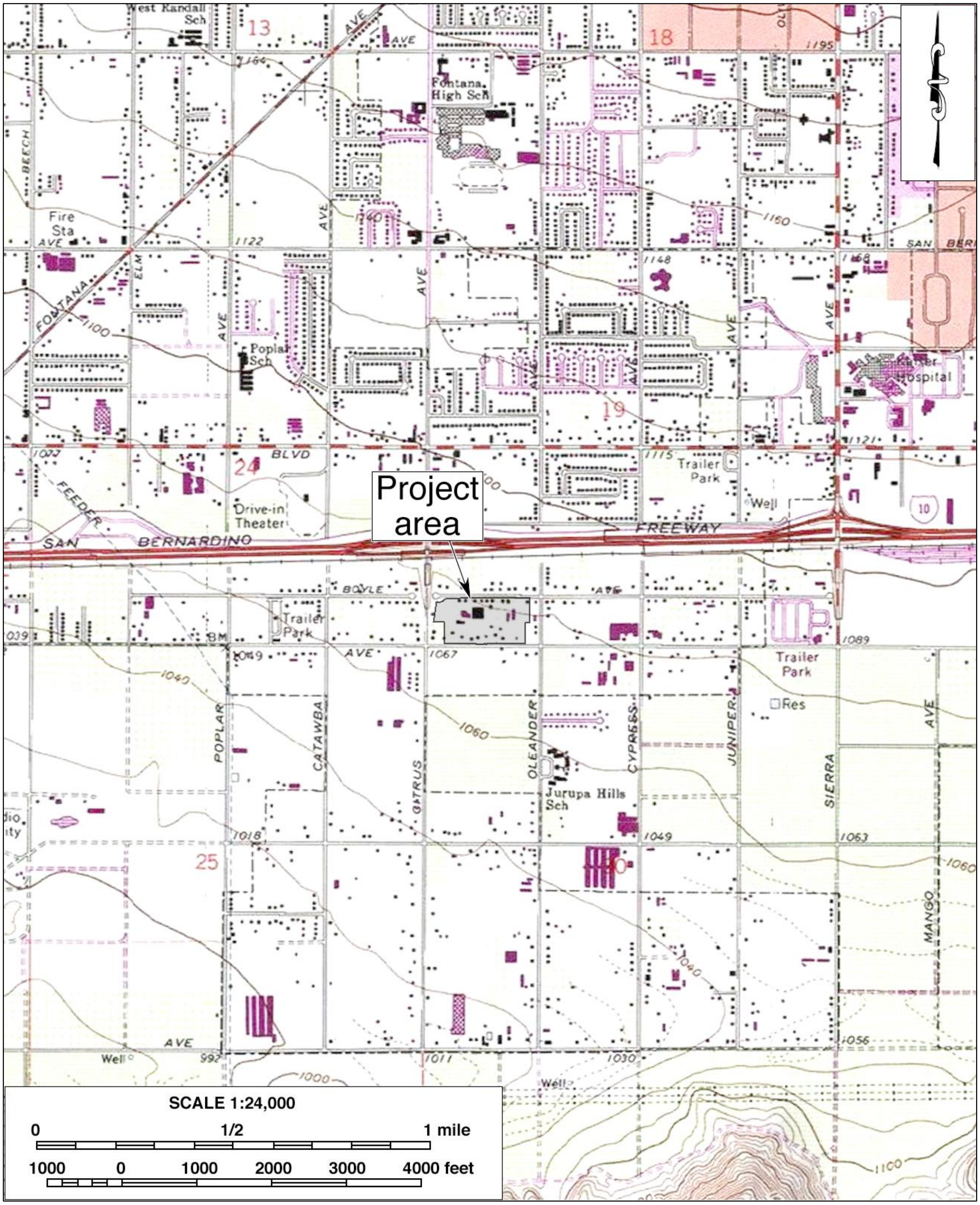

Figure 2. Project area. (Based on USGS Fontana, Calif., 7.5' quadrangle, 1980 edition)

Figure 3. Recent satellite image of the project area. (Based on Google Earth imagery)

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 Eric Scott and Kathleen Springer (2003:6) of the San Bernardino County Museum, 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 biotas;
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

REGIONAL GEOLOGIC SETTING

The project area is located in the northern portion of the Peninsular Ranges geomorphologic province, which is bounded on the north by the Transverse Ranges province, on the east by the Colorado Desert province, and on the west by the Pacific Ocean (Jenkins 1980:40-41; Harms 1996:150). The Peninsular Ranges province extends southward to the southern tip of Baja California (Jahns 1954).

More specifically, the City of Fontana is situated in the San Bernardino Valley, a structurally depressed trough filled with sediments of Miocene through Recent age (Clarke 1978-1979). The San Bernardino Valley is one of the many tectonically controlled valleys within the valley-and-ridge systems in the Perris Block, which was defined by English (1926) as a region between the San Jacinto and Elsinore-Chino fault zones. The block is bounded on the north by the Cucamonga (San Gabriel) Fault and on the south by a vaguely delineated boundary near the southern end of the Temecula Valley (*ibid*.). It is considered to have been active since Pliocene times (Woodford et al. 1971:3421). The Plio-Pleistocene-age non-marine sediments filling the valleys have produced a few vertebrate fossils as well as invertebrate fossil remains (Mann 1955:13).

CURRENT NATURAL SETTING

The City of Fontana is located in the central portion of the San Bernardino Valley, a broad inland valley defined by the San Gabriel and San Bernardino Mountain Ranges on the north and a series of low rocky hills on the south. The natural environment of the region is characterized by its temperate Mediterranean climate, with the average maximum temperature in July reaching 95º Fahrenheit and

Figure 4. Overview of the western portion of the project area. (Photograph taken on August 1, 2022; view to the northeast)

Figure 5. Overview of the eastern portion of the project area. (Photograph taken on August 1, 2022; view to the west)

the average minimum temperature in January hovering around 46º. Rainfall is typically less than 15 inches annually, most of which occurs between November and March.

The project area consists of approximately 15.44 acres of partially developed land bounded by Boyle Avenue on the north, Slover Avenue on the south, and residential and commercial properties to the east along Oleander Avenue. There are several single-family residences along Boyle and Slover Avenues, and a large metal warehouse stands in an open area in the interior of the project area (Fig. 3). The surrounding land use is largely the same as the project property, but the area is experiencing rapid change to large-scale commercial development.

Elevations in the project area range approximately between 1,072 and 1,084 feet above sea level over relatively level terrain. The native soils are brown loam and are very dark grayish brown in color, composed of active alluvial-channel deposits from the late Holocene Epoch (Morton 2003). The ground surface has been greatly disturbed by past agricultural operations and construction activities, with some areas covered with concrete, asphalt, or imported gravel (Figs. 4, 5). The existing vegetation consists mainly of landscaping plants, such as palms, citrus trees, trees of heaven, and various grasses and bushes.

METHODS AND PROCEDURES

RECORDS SEARCH

The paleontological records search service for this study was provided by the Regional Paleontological Locality Inventory located at the San Bernardino County Museum in Redlands. This institution maintains files of regional paleontological localities as well as supporting maps and documents. The records search results were used to identify known previously performed paleontological resource assessments as well as known paleontological localities within a one-mile radius of the project location. A copy of the records search results is attached to this report in Appendix 2.

LITERATURE REVIEW

In conjunction with the records search, CRM TECH field director Daniel Ballester and report writer Breidy Q. Vilcahuaman pursued a literature review on the project area and vicinity under the direction of principal paleontologist Ron C. Schmidtling. Sources consulted during the review include primarily topographic, geologic, and soil maps of the City of Fontana, published geologic literature pertaining to the project location, and other materials in the CRM TECH library, including unpublished reports generated by other similar surveys in the vicinity.

FIELD SURVEY

On August 1, 2022, CRM TECH paleontological surveyor Nina Gallardo carried out the intensive-level field survey of the project area. Where practicable, primarily in open areas not covered by pavement, the survey was completed by walking a series of parallel north-south transects spaced 15 meters (approximately 50 feet) apart. In areas occupied by buildings and other built-environment features, the survey followed meandering lines placed opportunistically wherever the ground was exposed. In this way, the ground surface in the area was carefully examined to determine the soil types, to verify the geological formations, and to look for any indications of paleontological remains.

Where the surface soil was exposed, ground visibility was very good (85-90%), but this was limited to roughly 30% of the total acreage surveyed on that day. Considering the extent of past ground disturbance on the property, however, the survey was considered adequate for the purpose of this study in spite of the limitations of surface visibility. After additional parcels were incorporated into the project area in 2023, CRM TECH archaeologist Hunter O'Donnell carried out a similar field survey on August 14, 2023, with good ground visibility due to recent mechanical clearing.

RESULTS AND FINDINGS

RECORDS SEARCH

The paleontological records search by the San Bernardino County Museum identified no known paleontological localities within or adjacent to the project area (Kottkamp 2022; see Appendix 2). However, paleontological localities have been reported nearby, ranging in distance approximately from two miles to five miles, from subsurface sediment lithologies similar to those known to occur at the project location. The nearest locality, SBCM 5.1.11, is located two miles southwest of the project area and consists of the remains of the extinct saber-toothed cat, *Smilodon* sp., found approximately five feet below the surface during trenching operations for a pipeline project (*ibid.*:1).

LITERATURE REVIEW

The surface geology within the project area has been mapped by several studies. Jahns (1954:Plate 3) mapped it as *Qal*, defined as alluvial fan, flood plain, swamp, lake, and sand dune deposits of Recent age. Morton (1976:Plate 1B) mapped the surface geology as *Qf*, or alluvial fan deposits of Holocene age. According to his stratigraphic column sequence, the *Qf* rests with variable thickness on top of *Qal* and/or *Qao*, which are described as alluvium of Holocene age and older, undifferentiated alluvium of Pleistocene age, respectively (*ibid*.). These *Qao* sediments consist of older alluvium that ranges from unconsolidated alluvial fan deposits to indurated decomposed clay-rich alluvium (*ibid*.). Clarke (1978-1979:Plate 2) mapped the surface geology as *Qf*, namely alluvial fan deposits of late Quaternary age. Bortugno and Spittler (1986) mapped the surface geology at the project location as *Qyl*, or younger fan deposits of Holocene age.

Woodruff and Brock (1980:Map Sheet 7) mapped the surface soils within the project area as *TuB*. This type of soils belongs to the Tujunga Series, specifically the Tujunga loamy sand, 0 to 5 percent slopes (*ibid*.:26). These soils develop on nearly level to gently sloping broad alluvial fans composed mainly of granitic alluvium (*ibid*.). More recently, Morton (2003) mapped the surface geology as *Qyf1*, or younger alluvial fan deposits of Holocene to late Pleistocene age (Fig. 6). He showed some outcrops of *Qof2* to the south of the project area and some scattered outcrops of *Qof3* to the west, which were described as alluvial fan deposits of late to middle Pleistocene age (*ibid.*).

FIELD SURVEY

The field survey yielded negative findings for potential paleontological resources, and no surficial indications of any fossil remains were observed within or adjacent to the project area. The survey confirms that the ground surface has been extensively disturbed by agricultural, construction, and demolition activities and is currently littered with building debris, domestic refuse, and concrete slab foundations left by demolished buildings. No observed soils on the property demonstrated any paleontological interest.

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, nonrenewable 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.

The results of the research procedures completed during this study indicate that the project area contains surface sediments of Holocene age and alluvial fan origin. Holocene-age sediments in the project vicinity tend to rest directly on top of older, Pleistocene-age sediments. The thickness of the Recent sediments is unknown, but it may be determined from on-site soil boring logs should they be available. While no fossil localities were reported in the project area or in the immediate vicinity,

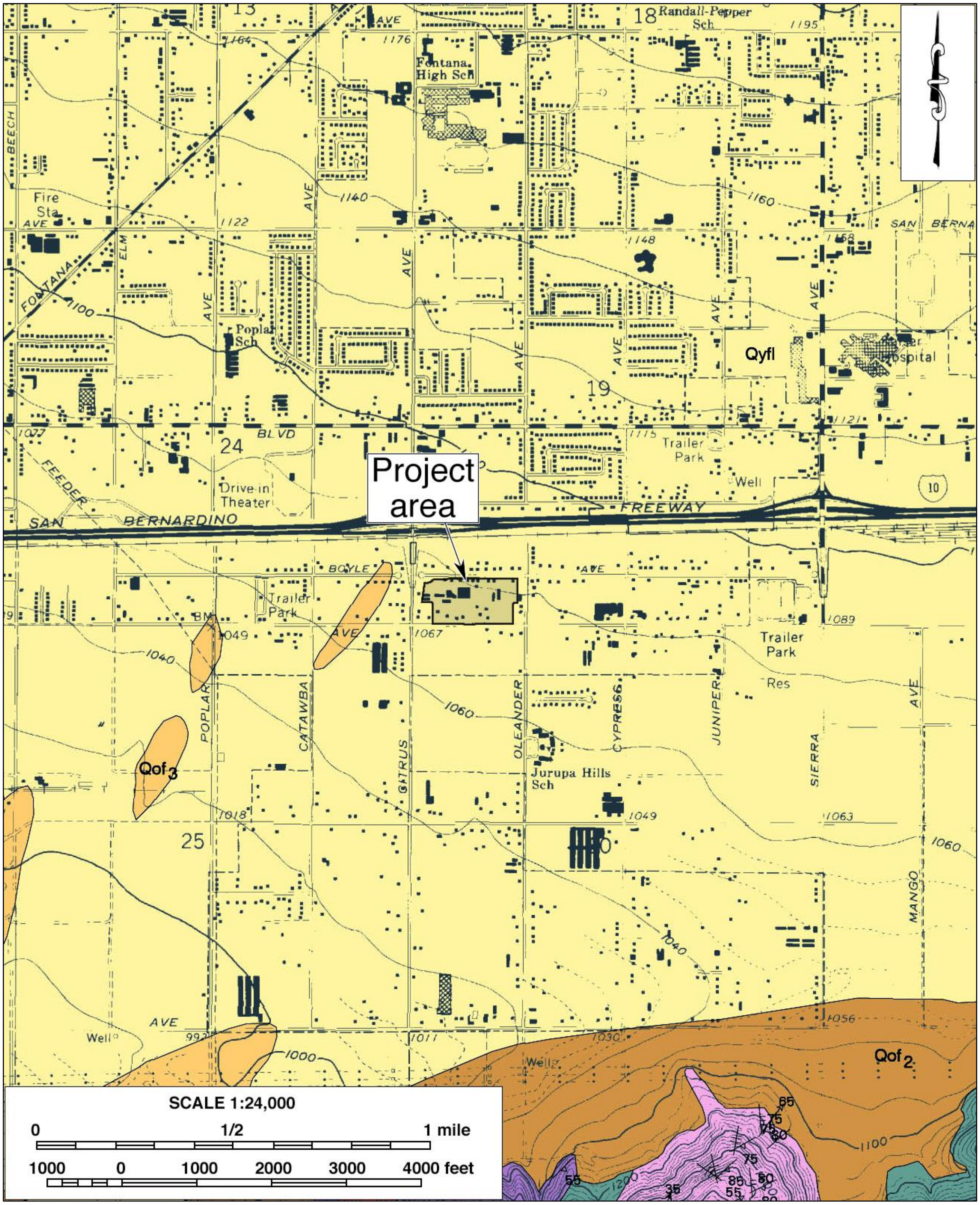

Figure 6. Geologic map of the project vicinity. (Source: Morton 2003)

sediments similar to those present under the ground surface at this location have produced significant fossils of extinct Ice Age animals in other portions of the San Bernardino Valley.

Based on these findings, the proposed project's potential to impact significant paleontological resources is determined to be low for the Holocene-age surface sediments but high for the undisturbed Pleistocene-age sediments at depth. Therefore, CRM TECH recommends that a paleontological resource impact mitigation program be developed and implemented during the project to prevent such impacts or reduce them to a level less than significant. The program should be developed in accordance with the provisions of CEQA as well as the proposed guidelines of the Society of Vertebrate Paleontology (2010), and should include, but not be limited to, the following:

As the primary component of the mitigation program, periodic monitoring of earth-moving activities for evidence of significant, nonrenewable paleontological resources is recommended from the onset of earth-moving operations for the project, and continuous monitoring is recommended once excavations have reached the depth of five feet, or if older sediments are encountered at lesser depth. The program should be developed in accordance with the provisions of CEQA as well as the proposed guidelines of the Society of Vertebrate Paleontology (2010), and should include, but not be limited to, the following:

- Periodic monitoring of earth-moving activities should be required during earth-moving operations for the project, and continuous monitoring will become necessary once ground disturbance reaches the depth of five feet or if the older sediments are encountered at lesser depth. 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.
- Collected samples of sediment should be processed to recover small fossils, and all recovered specimens 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 Fontana, would signify completion of the program to mitigate potential impacts on paleontological resources.

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APPENDIX 1

PERSONNEL QUALIFICATIONS

PRINCIPAL PALEONTOLOGIST
Ron Schmidtling, M.S.

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.

PALEONTOLOGICAL SURVEYOR/FIELD DIRECTOR
Daniel Ballester, M.S.

Education

2013	M.S., Geographic Information System (GIS), University of Redlands, California.
1998	B.A., Anthropology, California State University, San Bernardino.
1997	Archaeological Field School, University of Las Vegas and University of California, Riverside.
1994	University of Puerto Rico, Rio Piedras, Puerto Rico.

- Cross-trained in paleontological field procedures and identifications by CRM TECH Geologist/Paleontologist Harry M. Quinn.

Professional Experience

2002-	Field Director, CRM TECH, Riverside/Colton, California.
1999-2002	Project Archaeologist/Field Paleontologist, CRM TECH, Riverside, California.
1998-1999	Field Crew, K.E.A. Environmental, San Diego, California.
1998	Field Crew, A.S.M. Affiliates, Encinitas, California.
1998	Field Crew, Archaeological Research Unit, University of California, Riverside.

PALEONTOLOGICAL SURVEYOR/
Nina Gallardo, B.A.

Education

2004	B.A., Anthropology/Law and Society, University of California, Riverside.

Professional Experience

2004-	Project Archaeologist, CRM TECH, Riverside/Colton, California.

Honors and Awards

2000-2002	Dean’s Honors List, University of California, Riverside.

REPORT WRITER
Breidy Q. Vilcahuaman, M.A., RPA

Education

2018	M.A., Anthropology, Georgia State University, Atlanta, Georgia.
2005	B.A., Anthropology, University Nacional del Centro del Peru.

Professional Experience

2022-	Project Archaeologist, CRM TECH, Colton, California.
2021-2022	Archaeological Technician, Applied Earthwork, Inc., Hemet, California.
2021	Archaeologist/Crew Chief, Historical Research Associates, Inc., Portland, Oregon.
2020-2021	Archaeological/Paleontological Technician, Cogstone Resource Management, Orange, California.
2020	Archaeological Technician, McKenna et al., Whittier, California.

PALEONTOLOGICAL SURVEYOR
Hunter C. O'Donnell, B.A.

Education

2018	M.A. (anticipated), 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

2016-	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.

APPENDIX 2

RECORDS SEARCH RESULTS

2024 Orange Tree Lane, Redlands, California 92374 | Phone: 909.798.8608
www.SBCounty.gov

SAN BERNARDINO COUNTY

Museum
Division of Earth Science

Scott Kottkamp
Curator of Earth Science

8 July, 2022

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

PALEONTOLOGY RECORDS REVIEW for proposed sites of CRM Tech Boyle Southwest and Citrus Avenue projects, Fontana, San Bernardino County, California

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Dear Ms. Gallardo,

The Division of Earth Science of the San Bernardino County Museum (SBCM) has completed a record search for the above-named projects in San Bernardino County, California. The proposed project sites (Boyle Southwest and Citrus Avenue) are in the City of Fontana, California as shown on the United States Geological Survey (USGS) 7.5 minute Fontana, California quadrangle.

Geologic mapping of that region done by Morton (2003) and Dibblee et al. (2004) indicates the entire project site is situated atop latest Pleistocene and Holocene age alluvial fan deposits of the Lytle Creek Fan (Qyfl in Morton, Qa [young Quaternary alluvium] in Dibblee), comprised of an unconsolidated and poorly sorted mixture of sand, clay, and gravel covered by soil. This unit covers most of the surface in the Bloomington and Fontana area, and the alluvium's average grain size coarsens as one moves northward. These deposits are unlikely to be fossiliferous themselves, but directly overlie older Pleistocene alluvial deposits that are (Qoa). Qa sourced from the Jurupa Hills may also be a component of the sediment at the project sites.

Qoa mostly consists of fan deposits sourced from the mountain ranges and hills in and around the San Bernardino Valley, and was deposited between ~1,8 million to ~11,000 years ago.

Qoa is variable in its precise lithology, and often appears similar to units of Holocene age except slightly more consolidated. Pleistocene age alluvial deposits have been found to be highly fossiliferous in the local area, yielding the remains of mastodons, mammoths, *Smilodon*, camels, horses, bison, and ground sloths, as well as microfossils including rodents (Reynolds and Reynolds, 1991). Reynolds and Reynolds (1991) found that Pleistocene sediments in northwestern Riverside County generally lie about 5 – 15 feet below recent Holocene surface sediments. Overall thickness of Pleistocene-age alluvium exceeds several hundred feet in much of the region; the only other units found at or near the surface within 5 miles of the project sites are non-fossiliferous igneous and metamorphic rocks of Cretaceous or Paleozoic age (Morton, 2003; Dibblee et al., 2004).

For this review, I conducted a search of the Regional Paleontological Locality Inventory (RPLI) at the SBCM. The results of this search indicate that no paleontological resources have been discovered within the proposed project sites. The nearest locality, SBCM 5.1.11, is approximately 2 miles southwest of the proposed project sites. Permineralized bones of the saber-toothed cat *Smilodon* sp. were unearthed there, from 5 feet below the surface at an elevation of 1000 feet, during the excavation of a pipeline trench. SBCM 5.1.11 is covered with Qa at the surface, overlaying Qoa (where the *Smilodon* was found) by only a few feet.

Eight other localities, SBCM 5.1.14 – 5.1.21, are in a half-mile wide flood control basin located 3.5 miles from the project sites' midpoint. Each locality corresponds to a distinct unit of Qoa, which range in grain size from clay to very-fine sand and in color from olive-grey to yellow. All units' sediments are moist to wet. These units begin at the surface alongside the basin's edge, and the deepest corresponds to 21 feet below surface. Taxa found at these sites include: *Gyraulus* sp.; *Stagnicola* sp.; indeterminate Gastropoda; indeterminate Bivalvia; *Sylvilagus* sp.; *Thomomys* sp.; *Neotoma* sp.; *Microtus californicus*; *Mammut americanum*; *Bison* sp.; *Camelops hesternus*; *Equus* sp.; and many indeterminate mammalian bones, bone fragments, and enamel shards. Bones and enamel are preserved via permineralization, while invertebrate shells are either casts or recrystallized. Vertebrate fossils are incomplete to fragmentary, especially for larger animals, and often have taphonomic wear patterns suggesting fluvial transport. By comparison, the mollusk taxa identified are endemic to low energy waters, such as lakes or calm riversides. The fine sediments constituting the fossiliferous units also correlate with a lacustrine or low-energy fluvial depositional environment. Similar fossil assemblages to those present at SBCM 5.1.14 – 5.1.21 have been found in Qoa throughout the San Bernardino Valley.

Lastly, SBCM locality 5.1.22 is located approximately 5 miles southeast of the project sites. Permineralized *Mammut pacificus* bones were discovered at site 5.1.22, near the Santa Ana River, within a ditch filled with late Pleistocene age alluvium. The mastodon bones were unearthed from sand approximately 25 feet below the surface, during excavation of the ditch in 1916.

This records search covers only the paleontological records of the San Bernardino County Museum. 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.

Please do not hesitate to contact us with any further questions that you may have.

Sincerely,

Scott Kottkamp

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