CORAL MOUNTAIN RESORT

DRAFT EIR

SCH# 2021020310

TECHNICAL APPENDICES

Paleontological Report
Appendix H

June 2021

PALEONTOLOGICAL RESOURCES ASSESSMENT REPORT

CORAL MOUNTAIN SPECIFIC PLAN

City of La Quinta
Riverside County, California

For Submittal to:

Department of Design and Development, Planning Division
City of La Quinta
78-495 Calle Tempico
La Quinta, CA 92253

Prepared for:

CM Wave Development, LLC
2440 Junction Place, Suite 200
Boulder, CO 80301

Prepared by:

Harry M. Quinn, Geologist/Paleontologist
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CRM TECH
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Bai "Tom" Tang, Principal Investigator
Michael Hogan, Principal Investigator

October 29, 2019

CRM TECH Contract #3511P
Approximately 385 acres
USGS Indio, La Quinta, Martinez Mtn., and Valerie, Calif., 7.5' quadrangles
Sections 27 and 28, T6S R7E, San Bernardino Baseline and Meridian

EXECUTIVE SUMMARY

Between June and October 2019, at the request of CM Wave Development, LLC, CRM TECH performed a paleontological resource assessment on an approximately 385-acre tract of rural land in the City of La Quinta, Riverside County, California. The study is part of the environmental review process for the proposed Coral Mountain Specific Plan, which proposes the development of an artificial wave facility, a hotel, residential units, open space for golf, farm, outdoor recreational amenities, and an open-air amphitheater as well as the eventual development of four separately planned communities. The subject property of the study encompasses the entire area designated for the project, located on the west side of Madison Street, between Avenue 58 and Avenue 60, within Sections 27 and 28 of T6S R7E, San Bernardino Baseline and Meridian.

The City of La Quinta, 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 records searches at the appropriate repositories, conducted a literature review, and carried out a systematic field survey of the project area. Findings from these research procedures indicate that the project's potential to impact significant paleontological resources appears to be low in the igneous rock formation in the southwestern corner of the project area, namely on the slopes of Coral Mountain, and in the previously disturbed surface soils in the rest of project area. However, the undisturbed subsurface lakebed sediments from Holocene Lake Cahuilla are considered to be of high paleontological sensitivity.

Based on these findings, CRM TECH recommends that a mitigation program be developed and implemented for the proposed project to prevent potential impact on paleontological resources or reduce such impact to a level less than significant. As the primary component of the mitigation program, all earth-moving operations reaching beyond the depth of two feet should be monitored periodically by a qualified paleontological monitor, and continuous monitoring will become necessary if undisturbed, potentially fossiliferous lakebed sediments are encountered. Under this condition, 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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INTRODUCTION

Between June and October 2019, at the request of CM Wave Development, LLC, CRM TECH performed a paleontological resource assessment on an approximately 385-acre tract of rural land in the City of La Quinta, Riverside County, California (Fig. 1). The study is part of the environmental review process for the proposed Coral Mountain Specific Plan, which proposes the development of an artificial wave facility, a hotel, residential units, open space for golf, farm, outdoor recreational amenities, and an open-air amphitheater as well as the eventual development of four separately planned communities. The subject property of the study encompasses the entire area designated for the project, located on the west side of Madison Street, between Avenue 58 and Avenue 60, within Sections 27 and 28 of T6S R7E, San Bernardino Baseline and Meridian (Figs. 2, 3).

The City of La Quinta, 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 records searches at the appropriate repositories, 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.

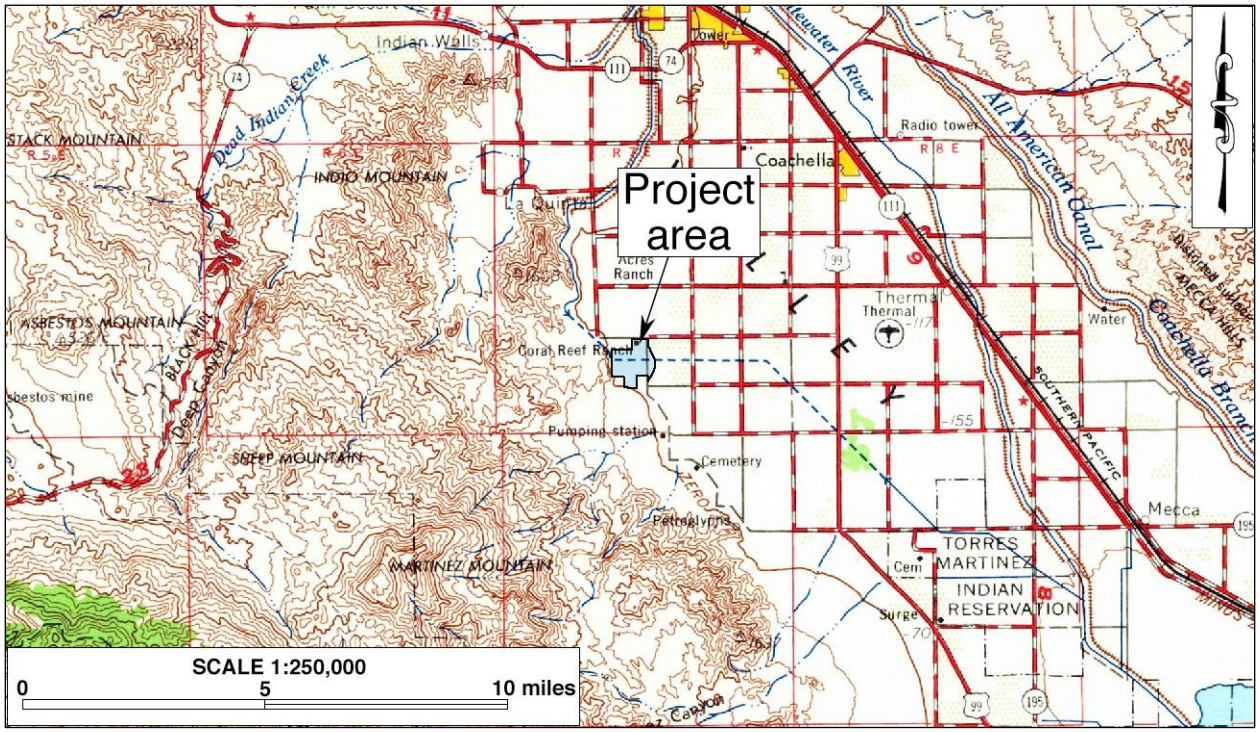

Figure 1. Project vicinity. (Based on USGS Santa Ana, Calif., 30'x60' quadrangle)

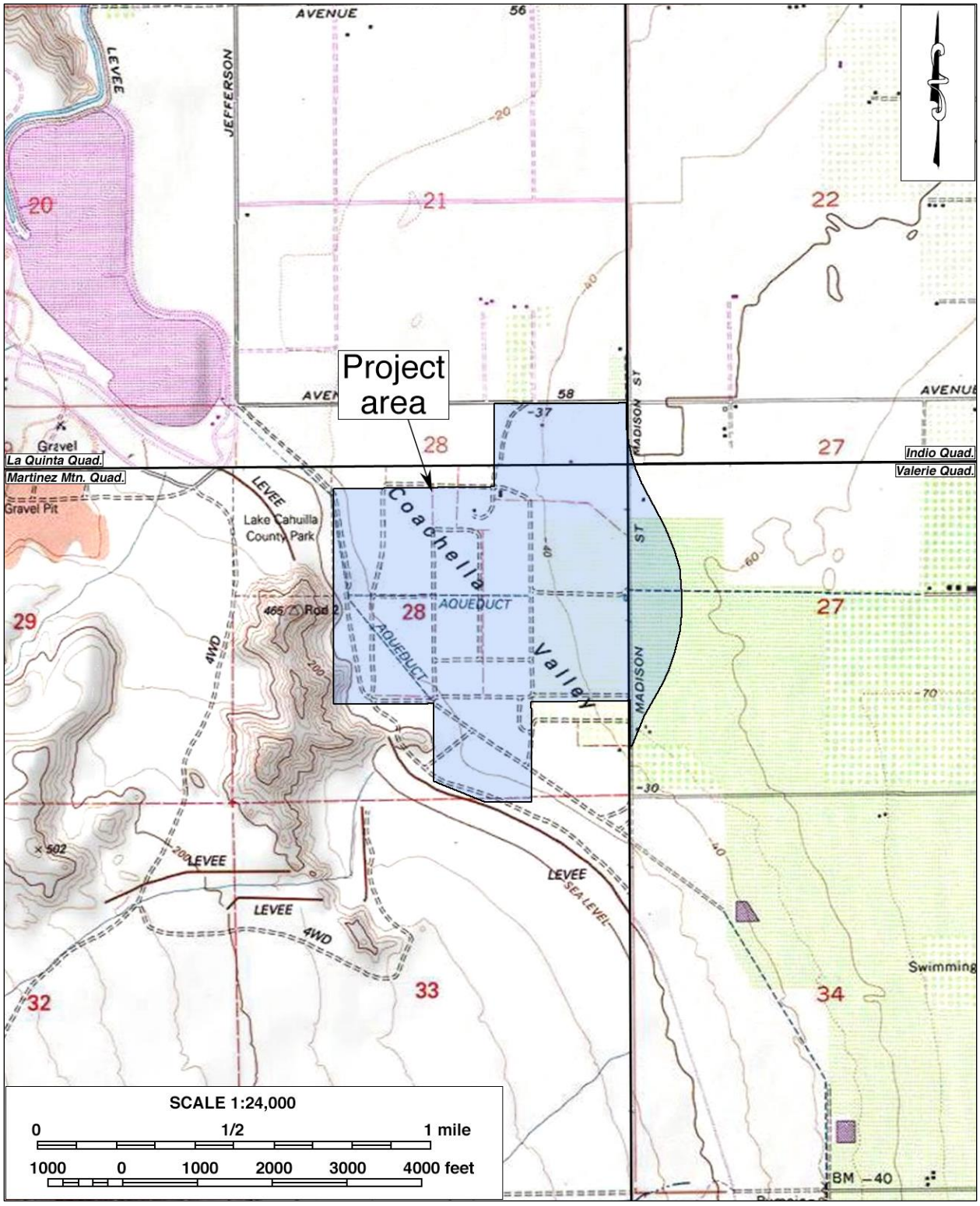

Figure 2. Project area. (Based on USGS Indio, La Quinta, Martinez Mtn., and Valerie, Calif., 7.5' quadrangles)

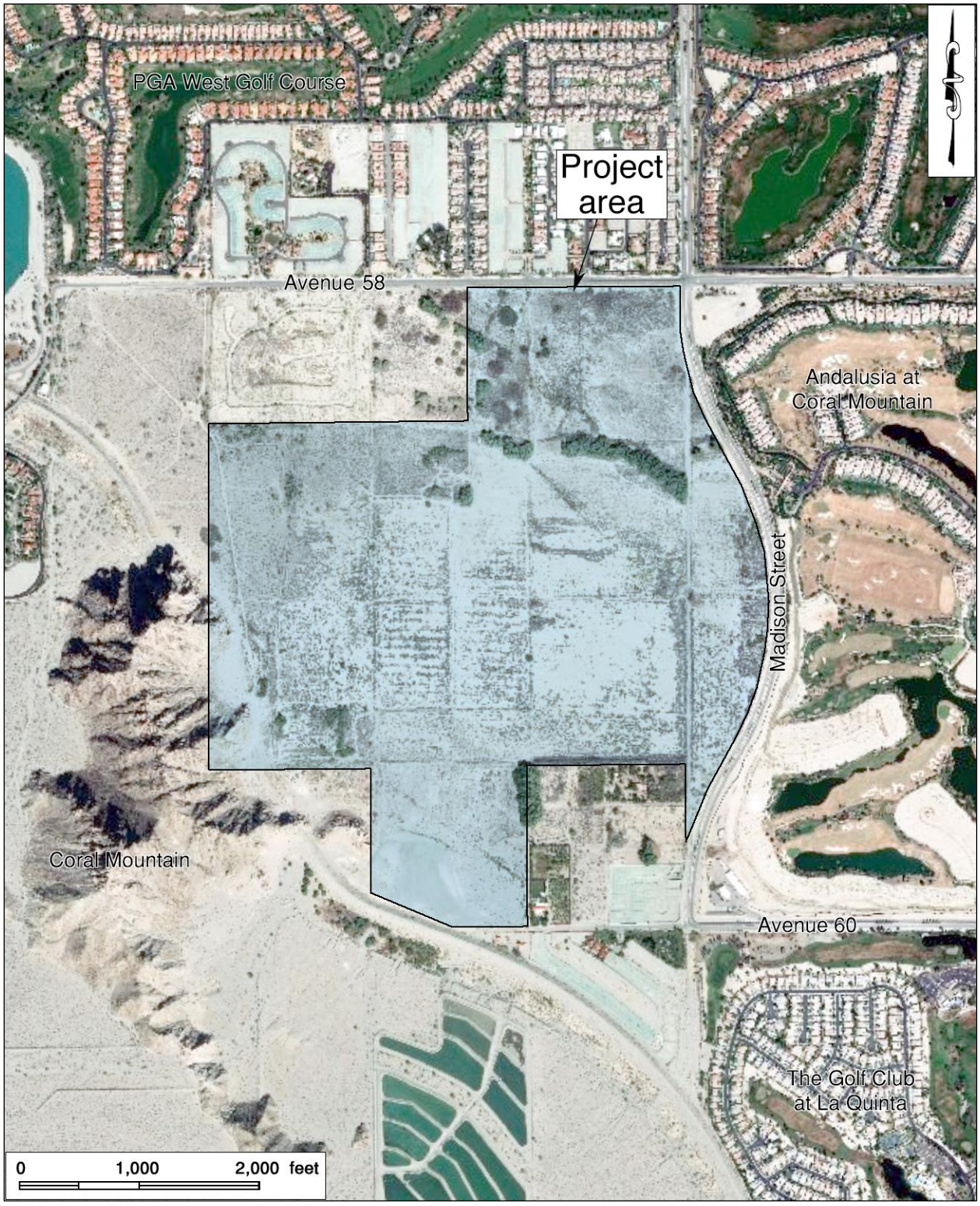

Figure 3. Aerial view of the project area.

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, which is typically regarded as older than approximately 12,000 years, the generally accepted temporal boundary marking the end of the last late Pleistocene (circa 2.6 million to 12,000 years B.P.) glaciation and the beginning of the current Holocene epoch (circa 12,000 years B.P. to the present).

Common fossil remains include marine shells; the bones and teeth of fish, amphibians, reptiles, and mammals; leaf 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) 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 situated in the Coachella Valley, which occupies the northwestern portion of the Colorado Desert geomorphic province (Jenkins 1980:40-41; Harms 1996:iii; Harden 2004:63-64). To the southeast from the Coachella Valley, the Colorado Desert province widens through the Imperial Valley and into Mexico, where it becomes the Gulf of California. A major feature in the Coachella Valley is the San Andreas Fault Zone, which runs along the northeastern edge of the valley. The project location lies on the opposite side of the valley and in the eastern foothills of the Santa Rosa Mountains, between the San Andreas Fault Zone and the roughly parallel San Jacinto Fault Zone to the west, which extends along the southwestern side of the mountain range.

Another major feature found in the Colorado Desert province is the Salton Trough, a 180-mile-long structural depression containing the present-day Salton Sea. This depression extends from the San Gorgonio Pass area southward into Mexico. During the late Miocene and early Pliocene, this trough was a northward extension of the Gulf of California (Powell 1995). By late Pleistocene and Holocene times, the northwestern portion of this trough was filled with over 4,000 feet of sediments (Proctor 1968). While the term "Salton Trough" refers to the entire structural depression from the San Gorgonio Pass to the Gulf of California, the term "Salton Basin" is used to describe the portion of the area that drains directly into present-day Salton Sea (Harms 1996:117).

Elevations within the Colorado Desert geomorphic province tend to be low, while those of the surrounding provinces can be quite high. This configuration has made for local to regional rapid filling of the basin, especially along its margins, with coarse clastic sediments. Such coarse sediments afford only local environments for the preservation of vertebrate remains. However, some scattered vertebrate fossils have been found in these fluvial derived clastic sediments.

At elevations ranging approximately from 50 feet above to 60 feet below mean sea level, the project area would have been on the shoreline of Holocene Lake Cahuilla, a series of freshwater lakes that once filled portions of the Salton Trough, including parts of the Coachella Valley. The lake formed when water from the Colorado River flowed into the basin and then through Baja California to the Gulf of California (Rogers 1965; Waters 1983). The shoreline of the last ancient lake to fill the basin, at its high stand prior to desiccation around 1700 A.D., reached the elevation of approximately 42 feet above mean sea level (Wilke 1978; Waters 1983). This elevation places most of the project area well within the lakebed sediments.

CURRENT NATURAL SETTING

The project area is located on the southcentral outskirts of the City of La Quinta and includes a portion of a rocky knoll known as Coral Mountain (Fig. 4). The surrounding land uses feature primarily existing residential development associated with golf courses to the north and the east and vacant land to the south and the west (Fig. 3). Much of the land within project boundaries has been farmed in the past, with the exceptions of the northeastern corner, the southernmost portion, and the far western edge near Coral Mountain (Fig. 3).

Figure 4. Overview of the current natural setting of the project area. (Photograph taken on August 9, 2019; view to the east)

A partially collapsed adobe house is located near the center of the project area, along with concrete pads and footings left by demolished residential and agricultural buildings. Several unpaved roads traverse throughout the project area. A large stockpile of soil sits in the southernmost portion, apparently removed from a retention basin located to the south of the property, across an earthen levee.

The terrain in most of the project area is relatively level due to the past agricultural operations, with the exception of the portion in and around Coral Mountain (Fig. 4). The northeastern portion does not appear to have been farmed but has also been cleared of vegetation. The terrain in this area is somewhat uneven. On the western edge, the land remains in a native creosote bush scrub state. A large amount of tufa has formed on the boulders and rocks at the base of Coral Mountain during the various stands of ancient Lake Cahuilla.

Soils in the former agricultural fields consists of fine- to medium-grained sands mixed with silt, clay, and freshwater shells. Beyond the agricultural fields, soils in the westernmost portion of the project area feature fine- to coarse-grained sands with rocks, boulders, and some freshwater shells. Fine-grained clay is exposed in some areas, especially near the former shoreline of Holocene Lake Cahuilla. Vegetation on the property includes creosote bush, mesquite, palo verde, brittlebush, saltbush, tumbleweed, and other small desert shrubs and grasses. Introduced landscaping trees such as tamarisk, eucalyptus, cottonwood, and palm are found near the former residences.

METHODS AND PROCEDURES

RECORDS SEARCHES

On July 3, 2019, CRM TECH sent written requests for records searches to the San Bernardino County Museum (SBCM) in Redlands and the Natural History Museum of Los Angeles County (NHMLAC) in Los Angeles. These institutions maintain files of regional paleontological localities as well as supporting maps and documents. The NHMLAC replied on July 17, but to date the SBCM has not been able to provide the data. As a result, past records search results from the SBCM on other properties nearby were consulted for pertinent information. The purpose of the records searches is to identify previously completed paleontological resource studies as well as known paleontological localities within a one-mile radius of the project area. In addition, the Riverside County Land Information System was also consulted for information on the County's overall paleontological sensitivity assessment of the project location.

LITERATURE REVIEW

In conjunction with the records searches, CRM TECH report writer Ben Kerridge pursued a literature review on the project area and vicinity, under the direction of project geologist/ paleontologist Harry M. Quinn, California Professional Geologist #3477. Sources consulted during the review include primarily topographic, geologic, and soil maps of the Coachella Valley region, published geologic literature pertaining to the project location, and other materials in the CRM TECH library, including unpublished reports produced during similar surveys in the vicinity.

FIELD SURVEY

On August 6-9, 2019, CRM TECH field director Daniel Ballester and paleontological surveyors Sal Boites, Sabrina Fajardo, Nina Gallardo, Ben Kerridge, Hunter O'Donnell, Michael Richards, and Damien Tietjen carried out the field survey of the project area. The survey was completed on foot by walking a series of parallel transects oriented north-south or east-west and spaced 15 meters (approximately 50 feet) apart. In this way, the entire project area was systematically examined for any indications of paleontological remains and to verify the geological formations and the soil types. Ground visibility ranged from poor (5-10%) in areas of dense vegetation, such as in the northeast corner of the property, to excellent (90%) in most of the other areas.

RESULTS AND FINDINGS

RECORDS SEARCHES

The records search by the NHMLAC identified no previously discovered paleontological localities within the project area but did identify nearby localities from sediment lithologies similar to those present both on the surface and at depth in the project area (McLeod 2019; see App. 2). Past records searches from the SBCM (Scott 2008a; Scott 2008b; Gilbert 2018) reported similar findings, stating that the geological units within the project area had produced fossil localities in the surrounding region.

According the NHMLAC, the southwestern portion of the project area is situated on bedrock exposures of intrusive igneous rocks that would not contain recognizable fossil remains (McLeod 2019). The rest of the project area is situated upon late Pleistocene or Holocene fluvial and lacustrine deposits known as Lake Cahuilla beds (*ibid.*). These deposits have produced fossils of diatoms, snails, crustaceans, land plants, and clams as well as terrestrial and freshwater vertebrate fossils nearby the project area (*ibid.*). Past records searches by the SBCM for nearby projects also reported fossil localities from the Lake Cahuilla beds that included fossil remains of, in addition to the types listed by the NHMLAC, sponges, ostracods, mollusks, fish, mastodons, ground sloths, and other large mammals (Scott 2008a; Scott 2008b; Gilbert 2018).

The NHMLAC states that excavations into the igneous rock outcrops in the southwestern portion of the project area will not need to be monitored (McLeod 2019). Regarding the remainder of the project area, the NHMLAC maintains that any shallow excavations in the uppermost layers of surface soils are unlikely to uncover significant vertebrate fossils, but deeper excavations extending into the Lake Cahuilla bed deposits may well encounter significant fossil vertebrate remains (*ibid.*). Past records searches by the SBCM mirror this assessment of the former lakebed deposits in that excavations in these soils have a high potential to impact significant nonrenewable paleontological resources (Scott 2008a; Scott 2008b; Gilbert 2018).

LITERATURE REVIEW

Rogers (1965) maps the surface geology in the project area as mainly *Ql* and *Qal*, or lakebed deposits and alluvium of Recent age, with some *Gr*, or Mesozoic granitic rocks, in the vicinity of Coral Mountain. Lancaster (2012) shows the surface geology to be composed of *gr* (granitic and other intrusive rocks), *Qyf* (young alluvial fan deposits, slightly to moderately consolidated, moderately dissected boulder, cobble, gravel, sand and silt deposits from valleys or canyons), *Qw* (alluvial wash deposits, unconsolidated sandy and gravelly sediments deposited in recently active channels of streams and rivers, sometimes containing loose silt and sand), and *Qya* (young alluvial valley deposits, unconsolidated to slightly consolidated, undissected to slightly dissected clay, silt, sand, and gravel along stream valleys and alluvial flats of larger rivers). Dibblee (2008) identifies the surface geology as mostly *Qa* (alluvial sand and clay of valley areas and of Holocene age) with a small area of *qdi* (light gray, massive to gneissoid quartz diorite of cretaceous age) in the southwestern corner (Fig. 5).

The Riverside County paleontological sensitivity map classifies the project location as *High Potential (High Sensitivity A)* in the northeastern half, *Undetermined Potential* in much of the southwestern half, and Low Potential in the exposed igneous outcrops in the southwestern corner (RCIT n.d.). *High Sensitivity A* is defined as "sedimentary rock units with high potential for containing significant non-renewable paleontological resources…based on geologic formations or mapped rock units that are known to contain or have the correct age and depositional conditions to contain significant paleontological resources. These include rocks of Silurian or Devonian age and younger that have potential to contain remains of fossil fish, and Mesozoic and Cenozoic rocks that contain fossilized body elements and trace fossils such as tracks, nests and eggs" (County of Riverside 2015:4.9-4.11). *Undetermined Potential* is defined as areas underlain by sedimentary units for which insufficient literature is available to make a determination of paleontological sensitivity (*ibid.*). *Low Potential* is defined as "lands for which previous field surveys and

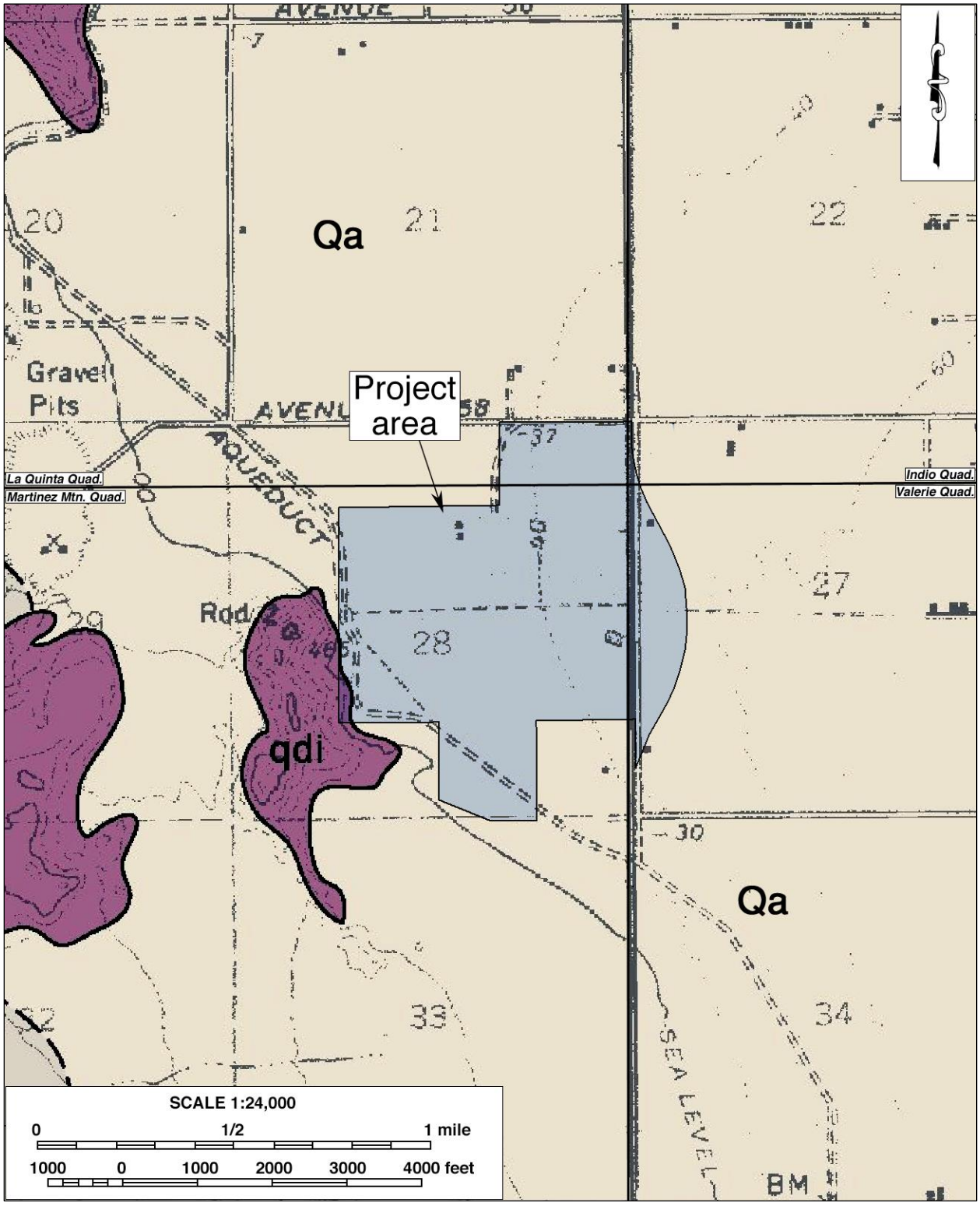

Figure 5. Geologic map of the project vicinity. (Source: Dibblee 2008)

documentation demonstrate as having a low potential for containing significant paleontological resources subject to adverse impacts" (*ibid.*). According to the County, "surface geology, such as soils, are not always indicative of subsurface geology or the potential for paleontological resources. For instance, an area mapped as soil type '*Qal*' may actually be a thin surficial layer of non-fossiliferous sediments which covers fossil-rich Pleistocene sediments" (*ibid.*).

FIELD SURVEY

The field survey of the project area encountered no surface manifestation of any vertebrate fossil remains. As mentioned above, the surface soils contained freshwater shells, especially in the former agricultural fields. The presence of these molluscan remains provides additional evidence that the sediments in the project area can be attributed to the Lake Cahuilla lakebed sequence. Fine-grained clay was observed in some areas, especially near the former lakeshore. Much of the surface soils have been impacted by past agricultural and construction activities, with dirt roads, earthen levees, residential debris, discarded refuse, and other evidence of human activities observed over most of the property.

DISCUSSION

The results of the record searches, the literature research, and the pedestrian field survey indicate that the project area contains Mesozoic intrusive igneous outcrops at Coral Mountain in the southwestern corner and sediments deposited within the lakebed of Holocene Lake Cahuilla over the remainder of the property (Rogers 1965; Dibblee 2008; Lancaster 2012; RCIT n.d.). The records search results identified fossil localities from these lakebed lithological units in the vicinity of the project area that contained species ranging from diatoms to terrestrial mammals such as mastodon and ground sloth (Scott 2008a; Scott 2008b; Gilbert 2018; McLeod 2019).

The NHMLAC's final conclusion regarding the paleontological sensitivity of the project area is that excavations in the igneous rocks will not encounter fossil remains, but that substantial excavations in the sedimentary deposits in the project area "should be monitored closely to quickly and professionally recover any fossil remains discovered" (McLeod 2019). Field observations did not encounter any surface manifestations of vertebrate fossil remains but did encounter significant concentrations of freshwater shells in the surface soils, which showed evidence of agricultural and other disturbances.

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.

The results of the study indicate that the potential for the proposed project to impact significant paleontological resources appears to be low in the igneous rock formation in the southwestern corner of the project area, namely on the slopes of Coral Mountain, and in the previously disturbed surface soils in the rest of project area. However, the undisturbed subsurface lakebed sediments from Holocene Lake Cahuilla are considered to be of high paleontological sensitivity.

Therefore, CRM TECH recommends that a mitigation program be developed and implemented for the proposed project to prevent potential impact on paleontological resources or reduce such impact to a level less than significant. The mitigation 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:

- All earth-moving operations reaching beyond the depth of two feet should be monitored periodically by a qualified paleontological monitor, and continuous monitoring will become necessary if undisturbed, potentially fossiliferous lakebed sediments are encountered. The monitor should be prepared to quickly salvage fossils, if they are unearthed, to avoid construction delays, but must have the power to temporarily halt or divert construction equipment to allow for removal of abundant or large specimens.
- Samples of sediments should be collected and processed to recover small fossil remains.
- Recovered specimens should be identified and curated at a repository with permanent retrievable storage that would allow for further research in the future.
- A report of findings, including an itemized inventory of recovered specimens and a discussion of their significance when appropriate, should be prepared upon completion of the research procedures outlined above. The approval of the report and the inventory by the City of La Quinta would signify completion of the mitigation program.

Under this condition, 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 GEOLOGIST/PALEONTOLOGIST
Harry M. Quinn, M.S., California Professional Geologist #3477

Education

1968 M.S., Geology, University of Southern California, Los Angeles, California.
1964 B.S, Geology, Long Beach State College, Long Beach.
1962 A.A., Los Angeles Harbor College, Wilmington, California.

- Graduate work oriented toward invertebrate paleontology; M.S. thesis completed as a stratigraphic paleontology project on the Precambrian and Lower Cambrian rocks of Eastern California.

Professional Experience

2000- Project Paleontologist, CRM TECH, Riverside/Colton, California.
1998- Project Archaeologist, CRM TECH, Riverside/Colton, California.
1992-1998 Independent Geological/Geoarchaeological/Environmental Consultant, Pinyon Pines, California.
1994-1996 Environmental Geologist, E.C E.S., Inc, Redlands, California.
1988-1992 Project Geologist/Director of Environmental Services, STE, San Bernardino, California.
1987-1988 Senior Geologist, Jirsa Environmental Services, Norco, California.
1986 Consulting Petroleum Geologist, LOCO Exploration, Inc. Aurora, Colorado.
1978-1986 Senior Exploration Geologist, Tenneco Oil E & P, Englewood, Colorado.
1965-1978 Exploration and Development Geologist, Texaco, Inc., Los Angeles, California.

Previous Work Experience in Paleontology

1969-1973 Attended Texaco company-wide seminars designed to acquaint all paleontological laboratories with the capability of one another and the procedures of mutual assistance in solving correlation and paleo-environmental reconstruction problems.

1967-1968 Attended Texaco seminars on Carboniferous coral zonation techniques and Carboniferous smaller foraminifera zonation techniques for Alaska and Nevada.

1966-1972, 1974, 1975 Conducted stratigraphic section measuring and field paleontological identification in Alaska for stratigraphic controls. Pursued more detailed fossil identification in the paleontological laboratory to establish closer stratigraphic controls, mainly with Paleozoic and Mesozoic rocks and some Tertiary rocks, including both megafossil and microfossil identification, as well as fossil plant identification.

1965 Conducted stratigraphic section measuring and field paleontological identification in Nevada for stratigraphic controls. Pursued more detailed fossil identification in the paleontological laboratory to establish closer stratigraphic controls, mainly with Paleozoic rocks and some Mesozoic and Tertiary rocks. The Tertiary work included identification of ostracods from the Humboldt and Sheep Pass Formations and vertebrate and plant remains from Miocene alluvial sediments.

Memberships

Society of Vertebrate Paleontology; American Association of Petroleum Geologists; Association of Environmental Professionals; Rocky Mountain Association of Geologists, Pacific Section; Society of Economic Paleontologists and Mineralogists; San Bernardino County Museum.

Publications in Geology

Five publications in Geology concerning an oil field study, a ground water and earthquake study, a report on the geology of the Santa Rosa Mountain area, and papers on vertebrate and invertebrate Holocene Lake Cahuilla faunas.

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/GIS Specialist, CRM TECH, Riverside/Colton, California.
1999-2002	Project Paleontologist/Archaeologist, 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/REPORT WRITER
Ben Kerridge, M.A.

Education

2014	Geoarchaeological Field School, Institute for Field Research, Kephallenia, Greece.
2010	M.A., Anthropology, California State University, Fullerton.
2009	Project Management Training, Project Management Institute/CH2M HILL, Santa Ana, California.
2004	B.A., Anthropology, California State University, Fullerton.

Professional Experience

2015-	Project Archaeologist/Report Writer, CRM TECH, Colton, California.
2015	Teaching Assistant, Institute for Field Research, Kephallenia, Greece.
2009-2014	Publications Delivery Manager, CH2M HILL, Santa Ana, California.
2010-	Naturalist, Newport Bay Conservancy, Newport Beach, California.
2006-2009	Technical Publishing Specialist, CH2M HILL, Santa Ana, California.
2002-2006	English Composition/College Preparation Tutor, various locations, California.

PALEONTOLOGICAL SURVEYOR
Salvadore Z. Boites, M.A.

Education

2013	M.A., Applied Anthropology, California State University, Long Beach.
2003	B.A., Anthropology/Sociology, University of California, Riverside.
1996-1998	Archaeological Field School, Fullerton Community College, Fullerton, California.

Professional Experience

2014-	Project Archaeologist, CRM TECH, Colton, California.
2010-2011	Adjunct Instructor, Anthropology, Everest College, Anaheim, California.
2003-2008	Project Archaeologist, CRM TECH, Riverside/Colton, California.
2001-2002	Teaching Assistant, Moreno Elementary School, Moreno Valley, California.
1999-2003	Research Assistant, Anthropology Department, University of California, Riverside.

Research Interests

Cultural Resource Management, Applied Archaeology/Anthropology, Indigenous Cultural Identity, Poly-culturalism.

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

Education

2020	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.

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.

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

Cultural Resources Management Reports

Co-author of and contributor to numerous cultural resources management reports since 2004.

PALEONTOLOGICAL SURVEYOR
Damien Tietjen, B.A.

Education

2002 GIS Certification, University of California, Riverside.
1996 B.A., Archaeology, College of Wooster, Wooster, Ohio.

2014 HAZWOPER Training (40 hours).
2012 NFPA 70E Electrical Safety Training (8 hours).
2004 10th Annual GI/GIS Workshop, Warsaw, Poland.

Professional Experience

2014- Project Archaeologist, CRM TECH, Colton, California.
2008-2014 Archaeologist/Environmental Compliance Monitor/GIS Specialist, Environmental Science Associates (ESA), Palms Springs, California.

PALEONTOLOGICAL SURVEYOR
Michael D. Richards, M.A., Registered Professional Archaeologist

Education

2002	M.A., Anthropology, California State University, Northridge (CSUN).
1986	B.A., Anthropology: University of California, Los Angeles (UCLA).
1982	A.A., Los Angeles Valley College, Los Angeles, California.

2015	Section 106 workshop.
2000	CSUN "Olmec" field excavation and lab analysis; La Venta, Mexico.
1999	Rock art recording, UCLA Extension; Little Lake, California.
1998	Rock art symposium, UCLA Extension.

Professional Experience

2016-2018	Co-Principal Investigator/Archaeologist, LSA Associates Inc.
2012-2016	Co-Principal Investigator/Archaeologist, ICF International (Jones & Stokes).
2010-2012	Co-Principal Investigator/Archaeologist, various CRM firms (on call).
2007-2010	Principal Investigator/Field Director/Crew Chief, ASM Affiliates, Inc.
2004-2007	Project Manager/Co-Principal Investigator, ArchaeoPaleo Resource Management, Inc.
2003-2004	Staff Archaeologist/Crew Chief, SRI, Inc.
2000-2003	Project Archaeologist/Field Director, Ancient Enterprises (Clewlow, Jr.).
1999-2000	Staff Archaeologist/Lab Crew Chief, CSC/Edwards Air Force Base.

Memberships

Society for American Archaeology; Society for California Archaeology; Archaeological Institute of America; Conejo Open Space Trails Advisory Committee; Conejo Valley Historical Society.

PALEONTOLOGICAL SURVEYOR
Sabrina Fajardo, B.S.

Education

2019	B.S., Anthropology, University of California, Riverside.
2018	Sanisera Archaeological Institute for International Field Schools, Menorca, Balearic Islands

Professional Experience

2019-	Project Archaeologist, CRM TECH, Riverside/Colton, California.
2017-	Information Officer, Eastern Information Center, University of California, Riverside.
2015-2017	AVID Tutor, Palm Middle School, Moreno Valley, California.

APPENDIX 2

RECORDS SEARCH RESULTS

Natural History Museum
of Los Angeles County
900 Exposition Boulevard
Los Angeles, CA 90007

tel 213-763-3466
nhm.org
Vertebrate Paleontology Section
Telephone: (213) 763-3325

e-mail: smcleod@nhm.org

17 July 2019

CRM Tech
1016 East Cooley Drive, Suite B
Colton, CA 92324

Attn: Nina Gallardo, Project Archaeologist

re: Paleontological resources for the proposed Wave at Coral Mountain Project, CRM TECH No. 3511P, in the City of La Quinta, Riverside County, project area

Dear Nina:

I have conducted a thorough search of our paleontology collection records for the locality and specimen data for the proposed Wave at Coral Mountain Project, CRM TECH No. 3511P, in the City of La Quinta, Riverside County, project area as outlined on the portions of the La Quinta, Indio, Martinez Mountain, and Valerie USGS topographic quadrangle maps that you sent to me via e-mail on 3 July 2019. We do not have any vertebrate fossil localities that lie directly within the proposed project area boundaries, but we do have localities nearby from the same deposits that occur in the proposed project area.

In the elevated terrain in the southwestern portion of the proposed project area there are bedrock exposures of intrusive igneous rock that will not contain recognizable fossils. Otherwise, surface deposits in the proposed project area are composed of soil on top of late Pleistocene or Holocene lacustrine and fluvial deposits known as the Lake Cahuilla beds. Immediately north of the northeastern border of the proposed project area on both sides of Madison Street north of 58th Avenue we have several fossil localities in the Lake Cahuilla beds. Localities LACM 6252, 6253, and 6255 were collected in a single trench site west of Madison Street. They produced a significant fauna of terrestrial and freshwater vertebrates (see attachment) as well as diatoms, land plants, clams, snails and crustaceans. A trench to the east of Madison Street produced a similar fauna so was not collected. A single jaw of the bighorn sheep *Ovis canadensis* was recovered from LACM 6256, another locality just to the east of Madison Street.

RECEIVED
JUL 19 2019

Excavations in the igneous rocks exposed in the elevated terrain in the southwestern portion of the proposed project area will not uncover any recognizable fossils. Any significant excavations below the uppermost layers of soil and younger Quaternary Alluvium in the rest of the proposed project area though may well encounter significant fossil remains from the Quaternary Lake Cahuilla beds. Any substantial excavations in the sedimentary deposits in the proposed project area, therefore, should be monitored closely to quickly and professionally recover any fossil remains discovered while not impeding development. Also, sediment samples should be collected and processed to determine the small fossil potential in the proposed project area. Any fossil materials uncovered during mitigation activities 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

enclosures: attachment; invoice

Vertebrate fossil taxa from the PGA West Tom Weiskopf Signature Golf Course
Trench 1 sites - LACM 6252, 6253 and 6255

Osteichthyes		
Cypriniformes		
Catostomidae		
Xyrauchen	*texanus*	razorback sucker
Cyprinidae		
Gila	*elegans*	bonytail
Cyprinodon	*macularius*	desert pupfish
Reptilia		
Squamata		
Iguanidae		
Phrynosoma	*platyrhinos*	desert horned lizard
Sceloporus	*magister*	desert spiny lizard
Uma	*inornata*	Coachella Valley fringe-toed lizard
Urosaurus	*graciosus*	long-tailed brush lizard
Colubridae		
Chionactis	*occipitalis*	western shovel-nosed snake
Hypsiglena	*torquata*	night snake
Pituophis	*melanoleucus*	gopher snake
Sonora	*semiannulata*	western ground snake
Crotalidae		
Crotalus	*cerastes*	sidewinder rattlesnake
Aves		
Passeriformes		advanced land birds
Mammalia		
Lagomorpha		
Leporidae		
Sylvilagus		cottontail rabbit
Rodentia		
Cricetidae		
Neotoma	*lepida*	desert wood rat
Peromyscus		white-footed mouse
Heteromyidae		
Dipodomys		kangaroo rat
Perognathus	*longimembris*	pocket mouse
Sciuridae		
Ammospermophilus	*leucurus*	antelope ground squirrel