Appendix 5.5-3 Paleontological Resources Technical Report

Appendices

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PALEOSERVICES
SAN DIEGO NATURAL HISTORY MUSEUM

Paleontological Resources Technical Report

Inland Valley Medical Center Expansion
City of Wildomar
Riverside County, California

November 6, 2020

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Executive Summary

This technical report provides an assessment of paleontological resources at the proposed Inland Valley Medical Center Expansion project (Project) site in the City of Wildomar, Riverside County, California. The purpose of this report is to identify and summarize paleontological resources that occur in the vicinity of the Project site, identify Project elements (if any) that may negatively impact paleontological resources, and provide, if necessary, recommendations to reduce any potential negative impacts to less than significant levels. The report includes the results of institutional records searches conducted at the San Diego Natural History Museum (SDNHM) and Western Science Center (WSC), and the paleontological field survey conducted of the Project site.

The existing 22.24-acre Inland Valley Medical Center (IVMC) site is roughly triangular, and is bordered to the east by Inland Valley Drive and an existing business park, to the southwest by Interstate (I-) 15, and to the northwest by a natural ravine. The Project proposes to construct a new 7-story, 232,626 square foot (SF) tower, modify existing Building I, modify existing Building A, and construct a new CUP, all located within the existing IVMC campus. As part of the Project, Buildings B-H and C will be demolished for the creation of new surface parking and the new tower, respectively.

Published geologic mapping and the geotechnical investigation report covering the Project site indicate that the site is primarily underlain by the middle to late Pleistocene-age (approximately 650,000 to 125,000 years old) Pauba Formation. In addition, based on geologic mapping of the site, the sandstone member of the late Pliocene- to middle Pleistocene-age (approximately 3.5 million to 650,000 years old) informal unit “sandstone and conglomerate of Wildomar area” (or, “sandstone of Wildomar area”) appears to underlies the Pauba Formation at relatively shallow depths within the Project site. According to the geotechnical investigation report, the Pauba Formation is overlain in areas of previous development by 1 to 11 feet of artificial fill. The paleontological field survey confirmed the conditions presented in published geologic maps in the few areas where sedimentary strata were exposed within the Project site. Only strata of the “sandstone of Wildomar area” were encountered in the northern portion of the Project site. Observed lithologies consisted of pale olive and pale reddish brown silty fine- to medium-grained sandstones, and brown and tan poorly sorted coarse- to very-coarse grained gritty sandstones with pebble lenses. The Pauba Formation was not directly observed within the Project site due to the presence of pavement, existing structures, landscaped vegetation, natural scrub vegetation, and artificial fill.

WSC reports one recorded fossil collection locality from the Pauba Formation within a 1-mile radius of the Project site, while SDNHM has four recorded fossil collection localities from the Pauba Formation within an expanded 5-mile radius of the site. All five of these localities are located in the City of Murrieta. On the whole, the Pauba Formation has produced a middle to late Irvingtonian-age fossil mammal assemblage, along with fossil remains of land snails, freshwater fish, amphibians, reptiles, and birds. The informal “sandstone of Wildomar area,” meanwhile, has produced large and diverse late Blancan and early to middle Irvingtonian land mammal assemblages from exposures along the northeast side of I-15 between Nutmeg Street and Los Alamos Road, between 1 and 3 miles southeast of the Project site. Also recovered from these exposures were fossil remains of freshwater clams and snails, amphibians, and reptiles.

A high paleontological sensitivity (category A) is assigned to both the Pauba Formation and “sandstone of Wildomar area” within the Project site, while any overlying artificial fill deposits are assigned a low paleontological sensitivity. Construction of the proposed Project has the potential to impact paleontological resources during earthwork exceeding the depths of any artificial fill present in previously developed areas of the Project site, where previously undisturbed deposits of the Pauba Formation and “sandstone of Wildomar area” are present. Thus, implementation of a paleontological mitigation program centered around paleontological monitoring is recommended, as outlined in the provided Mitigation Measures 1–7. Implementation of the paleontological mitigation program will reduce any Project-related impacts to paleontological resources to a level that is less than significant.

Contents

1.0 Introduction

1.1 Project Description

This technical report provides an assessment of paleontological resources for the proposed Inland Valley Medical Center Expansion project (Project) site, located in the southeastern portion of the City of Wildomar, Riverside County, California (Figure 1). The existing 22.24-acre Inland Valley Medical Center (IVMC) site is roughly triangular, and is bordered to the east by Inland Valley Drive and an existing business park, to the southwest by Interstate (I-) 15, and to the northwest by a natural ravine. The existing IVMC buildings include one- and two-story buildings: Buildings A, B-H, C, I, a Central Utility Plant (CUP), and an administrative building. The goal of the Project is to expand all services and critical ancillary support for 100 new patient beds, for a total of 202 patient beds at the expanded IVMC.

The Project proposes to construct a new 7-story, 232,626 square foot (SF) tower, modify existing Building I, modify existing Building A, and construct a new CUP, all located within the existing IVMC site. As part of the Project, Buildings B-H and C will be demolished for the creation of new surface parking and the new tower, respectively. Construction of the Project will be accomplished in three phases, as outlined below.

<u>Phase 1 – Enable and Make-Ready</u>

- Building C will be demolished to enable construction of the new tower.
- Curbs, gutters, asphalt paving, and trees will be removed.
- The parking area will be reconfigured and drainage will be improved with stormwater retention basins.
- Site utility upgrades and landscape improvements to accommodate the renovations and tower construction.

<u>Phase 2 – Hospital Expansion, Renovation of Existing Buildings, and Central Utility Plant</u>

- The new tower will be constructed during this phase of work. The new tower will connect to existing buildings A and I. The ground level will be the emergency department with direct access for walk-in patients and ambulances. Operating rooms will be located on the 2nd floor, with beds located on the remaining 5 floors of the tower.
- Modifications to Building A will include a new main entry canopy and lobby renovation, a connecting corridor linking the new entry with public elevators in the new tower, and renovated space for relocated departments.
- Modifications to Building I will include enclosure of the first floor open parking area to construct a new loading dock and materials management department.
- A new CUP will be constructed to serve the new tower and backfeed Buildings A and I.
- The south surface parking and the south section of the ring road will be completed.

<u>Phase 3 – Demolition of Building B-H, Eastern Parking Area and Associated Landscape</u>

- Building B-H and the existing CUP will be demolished.
- The east façade of Building A will be refreshed.
- The east parking lot will be constructed, the existing ground-level helipad will become a surface stormwater retention basin, and landscaping will be installed.

1.2 Scope of Work

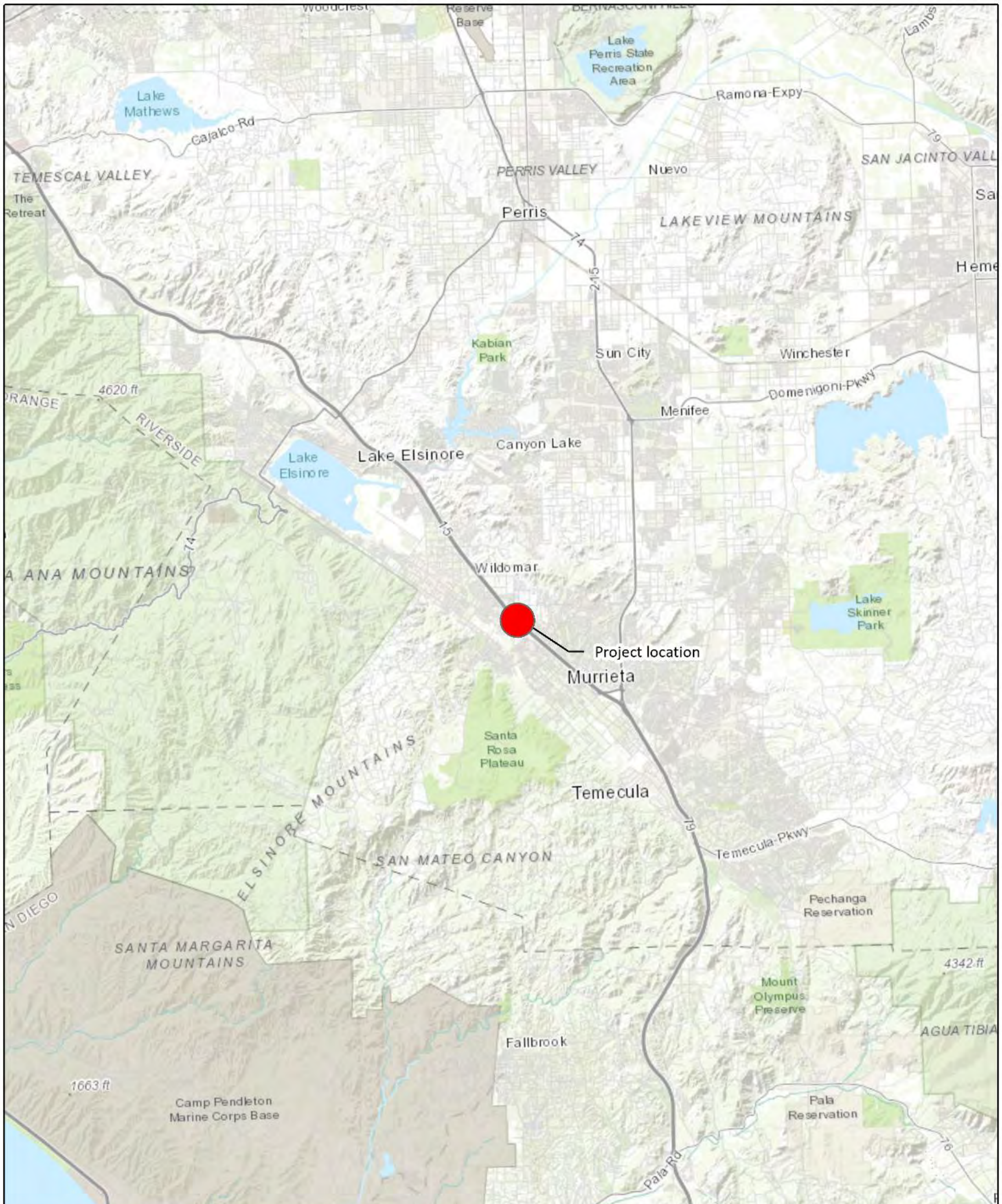
Because the Project site occurs in an area partially underlain by native sedimentary deposits, a paleontological resource assessment was conducted in order to satisfy City of Wildomar and County of Riverside requirements and to evaluate whether the proposed Project has the potential to negatively impact paleontological resources. The assessment addresses potential impacts to paleontological resources that may occur during construction of the proposed Project by summarizing existing paleontological resource data at the Project site, evaluating the significance of these resources, examining potential Project-related impacts to paleontological resources, and, if necessary, suggesting mitigation measures to reduce impacts to paleontological resources to less than significant levels. The assessment also includes the results of a literature review of relevant geological and paleontological reports, institutional records searches of the paleontological collections at the San Diego Natural History Museum (SDNHM) and Western Science Center (WSC), and the paleontological field survey. This technical report was prepared by Katie M. McComas and Thomas A. Deméré of the Department of PaleoServices, SDNHM.

1.3 Definition of Paleontological Resources

As defined here, paleontological resources (i.e., fossils) are the buried remains and/or traces of prehistoric organisms (i.e., animals, plants, and microbes). Body fossils such as bones, teeth, shells, leaves, and wood, as well as trace fossils such as tracks, trails, burrows, and footprints, are found in the geologic units/formations within which they were originally buried. The primary factor determining whether an object is a fossil or not is not how the organic remain or trace is preserved (e.g., "petrified"), but rather the age of the organic remain or trace. Although typically it is assumed that fossils must be older than ~11,700 years (i.e., the generally accepted end of the last glacial period of the Pleistocene Epoch), organic remains older than recorded human history and/or older than middle Holocene (about 5,000 radiocarbon years) can also be considered to represent fossils (SVP, 2010).

Fossils are considered important scientific and educational resources because they serve as direct and indirect evidence of prehistoric life and are used to understand the history of life on Earth, the nature of past environments and climates, the membership and structure of ancient ecosystems, and the pattern and process of organic evolution and extinction. In addition, fossils are considered to be non-renewable resources because typically the organisms they represent no longer exist. Thus, once destroyed, a particular fossil can never be replaced.

Finally, paleontological resources can be thought of as including not only the actual fossil remains and traces, but also the fossil collection localities and the geologic units containing those localities. The locality includes both the geographic and stratigraphic context of fossils—the place on the earth and stratum (deposited during a particular time in earth's history) from which the fossils were collected. Localities themselves may persist for decades, in the case of a fossil-bearing outcrop that is protected from natural or human impacts, or may be temporarily exposed and ultimately destroyed, as is the case for fossil-bearing strata uncovered by erosion or construction. Localities are documented with a set of coordinates and a measured stratigraphic section tied to elevation detailing the lithology of the fossil-bearing stratum as well as that of overlying and underlying strata. This information provides essential context for any future scientific study and educational use of the recovered fossils.



Sources: World Topographic Map, Esri et al., 2020

PALEOSERVICES

Figure 1: Overview Map, Inland Valley Medical Center Expansion
Wildomar, Riverside County, California

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scale in miles

Figure 2: Project Site Plan, Inland Valley Medical Center Expansion, City of Wildomar, Riverside County, California

1.3.1 Definition of Significant Paleontological Resources

The California Environmental Quality Act (CEQA, Public Resources Code Section 21000 et seq.) dictates that a paleontological resource is considered significant if it “has yielded, or may be likely to yield, information important in prehistory or history” (Section 15064.5, [a][3][D]). The Society of Vertebrate Paleontology (SVP) has further defined significant paleontological resources as consisting of “fossils and fossiliferous deposits[…]consisting of identifiable vertebrate fossils, large or small, uncommon invertebrate, plant, and trace fossils, and other data that provide taphonomic, taxonomic, phylogenetic, paleoecologic, stratigraphic, and/or biochronologic information” (SVP, 2010).

1.4 Regulatory Framework

Paleontological resources are considered scientifically and educationally significant nonrenewable resources, and as such they are protected under a variety of federal (e.g., Antiquities Act of 1906; National Environmental Policy Act of 1969; Federal Land Policy Management Act of 1976; Paleontological Resources Preservation Act of 2009), state (e.g., California Environmental Quality Act [CEQA]; Public Resources Code), and local (City of Wildomar; County of Riverside) laws, regulations, and ordinances, outlined below.

1.4.1 Federal

The American Antiquities Act of 1906 (P.L. 59–209, 34 Stat. 225, 16 U.S.C. 431–433) establishes a penalty for disturbing or excavating any historic or prehistoric ruin or monument or object of antiquity on federal lands. The act also establishes a permit requirement for collection of antiquities on federal lands. Although not specifically addressing paleontological resources, the act is considered relevant to such resources by number of federal agencies that consider fossils to be objects of antiquity.

The National Environmental Policy Act (NEPA) of 1969 (P.L. 91–190, 83 Stat. 852, 42 U.S.C. 4321–4347) recognizes the continuing responsibility of the Federal Government to “preserve important historic, cultural, and natural aspects of our national heritage...” (Sec. 101 [42 U.S.C. § 4321]) (#382). As with the American Antiquities Act, NEPA does not specifically address paleontological resources but is interpreted by many federal agencies to be applicable to such resources. For example, the BLM and the USFS both view NEPA as one of the major laws protecting paleontological resources on public lands.

The Federal Land Policy and Management Act (FLPMA) of 1976 (P.L. 94–579, 90 Stat. 2744, 43 U.S.C. 1701–1785) defines significant fossils as: unique, rare or particularly well-preserved; an unusual assemblage of common fossils; being of high scientific interest; or providing important new data concerning [1] evolutionary trends, [2] development of biological communities, [3] interaction between or among organisms, [4] unusual or spectacular circumstances in the history of life, [5] or anatomical structure.

The Paleontological Resources Preservation Act (PRPA) of 2009 (P.L. 111–11, 123 Stat. 991, H.R. 146) is the first statute to directly address the management and protection of paleontological resources on federal lands. This law essentially codifies collecting polices of federal land management agencies. It allows reasonable amounts of common invertebrate and plant fossils to be casually collected with negligible disturbance. In addition, it requires protection and preservation of uncommon invertebrate and plants and all vertebrate fossils, including imprints, molds, casts, etc. The PRPA further describes requirements for permitting collection on federal lands, stipulations regarding the use of paleontological resources in education, continued federal ownership of recovered paleontological resources, and standards for acceptable repositories of collected specimens and associated data. The PRPA also provides for criminal and civil penalties for unauthorized removal of paleontological resources from federal lands.

1.4.2 State

The California Environmental Quality Act (CEQA, Public Resources Code Section 21000 *et seq.*) protects paleontological resources on both state and private lands in California. This act requires the identification of environmental impacts of a proposed project, the determination of significance of the impacts, and the identification of alternative and/or mitigation measures to reduce adverse environmental impacts. The Guidelines for the Implementation of CEQA (Title 14, Chapter 3, California Code of Regulations: 15000 *et seq*.) outlines these necessary procedures for complying with CEQA. Paleontological resources are specifically included as a question in the CEQA Environmental Checklist (Section 15023, Appendix G): “Will the proposed project directly or indirectly destroy a unique paleontological resource or site or unique geologic feature.” Also applicable to paleontological resources is the checklist question: “Does the project have the potential to… eliminate important examples of major periods of California history or pre-history.”

Other state requirements for paleontological resource management are included in the Public Resources Code (Chapter 1.7), Section 5097.5 and 30244. These statutes prohibit the removal of any paleontological site or feature on public lands without permission of the jurisdictional agency, defines the removal of paleontological sites or features as a misdemeanor, and requires reasonable mitigation of adverse impacts to paleontological resources from developments on public (state) lands.

1.4.3 Local

The County of Riverside General Plan contains extensive information, policies, guidelines, and recommendations concerning the treatment of paleontological resources (County of Riverside, 2015).

The City of Wildomar has incorporated the County of Riverside’s General Plan, and therefore adopts its policies, guidelines, and recommendations regarding paleontological resources.

2.0 Methods

2.1 Paleontological Records Searches and Literature Review

Paleontological records searches were conducted at the SDNHM and WSC in order to determine if any documented fossil collection localities occur within the Project site or immediate surrounding area. The SDNHM records search involved examination of the paleontological database for any records of known fossil collection localities from sedimentary deposits similar to those underlying the Project site within an expanded 5-mile radius. A records search of the paleontological collections at WSC was also requested (WSC, 2020; Appendix).

Additionally, a review was conducted of relevant published geologic maps (e.g., Kennedy et al., 2003; Morton and Miller, 2006), published geological and paleontological reports (e.g., Bell, 1993; Pajak et al., 1996; Reynolds et al., 1990), and other relevant literature (e.g., unpublished paleontological mitigation reports). This approach was followed in recognition of the direct relationship between paleontological resources and the geologic units within which they are entombed. Knowing the geologic history of a particular area and the fossil productivity of geologic units that occur in that area, makes it is possible to predict where fossils may, or may not, be encountered.

2.2 Paleontological Field Survey

A paleontological field survey of the Project site was conducted on November 5, 2020, by Katie M. McComas and Todd W. Ryan of the Department of PaleoServices, SDNHM. The purpose of the field survey was to confirm the published geologic mapping, to field check the results of the literature and records searches, and to determine the paleontological potential/sensitivity of the strata present within the Project site. The field survey included inspection of available natural and man-made exposures within the Project site in order to collect stratigraphic data (e.g., bedding type, thickness, geologic contacts), detailed lithologic descriptions of strata (e.g., color, sorting of grains, texture, sedimentary structures, and grain size of sedimentary rocks), and prospect for any fossilized remains present at the surface.

During the survey, the field paleontologists were equipped with standard field equipment (e.g., rock hammer, camera, hand lens, tape measure) and an iPhone loaded with Esri's Collector app that was used to view relevant maps and collect field data. Collected field data included waypoints that were keyed to field notes and photographs.

2.3 Paleontological Resource Assessment Criteria

The County of Riverside has developed standards for assessing paleontological potential/sensitivity that are based, in part, on the standards set forth by Society of Vertebrate Paleontology (SVP, 2010), and that also take into account the possibility for adverse impacts due to human influence. The County recognizes a tripartite scale: High Potential (High A and High B subcategories), Low Potential, and Undetermined Potential.

The specific criteria for each scale of Paleontological Sensitivity is outlined below.

2.3.1 High Potential/Sensitivity

High sensitivity is assigned to geologic units known to contain paleontological localities with rare, well-preserved, critical fossil materials for stratigraphic or paleoenvironmental interpretation, and fossils providing important information about the paleobiology and evolutionary history (phylogeny) of animal and plant groups. Generally speaking, highly sensitive formations produce vertebrate fossil remains or are considered to have the potential to produce such remains.

In Riverside County, High Paleontological Potential A is assigned to rock units present immediately at the surface, while High Paleontological Potential B is assigned to rock units found at a depth of 4 feet or greater below existing grade.

2.3.2 Low Potential/Sensitivity

Low sensitivity is assigned to geologic units that, based on their relative youthful age and/or high-energy depositional history, are judged unlikely to produce important fossil remains. Typically, low sensitivity formations produce invertebrate fossil remains in low abundance. Low paleontological potential is also assigned to geologic formations that are entirely igneous in origin and therefore have no potential for producing fossil remains, or to artificial fill materials which lose the stratigraphic/geologic context of any contained organic remains (e.g., fossils).

2.3.3 Undetermined Potential/Sensitivity

Undetermined sensitivity is assigned to geologic units that exhibit geologic features and preservational conditions that suggest significant fossils could be present, but little information about the geology and/or paleontological resources of the unit or the area is known. This may indicate the unit or area is poorly studied, and field surveys may be useful for more precisely determining the paleontological sensitivity.

2.4 Paleontological Impact Analysis

Direct impacts to paleontological resources occur when earthwork activities (e.g., mass grading, utility trenching), cut into the geologic units within which fossils are buried, and physically destroy the fossil remains. As such, only earthwork activities that will disturb potentially fossil-bearing sedimentary deposits (i.e., those rated with a high or undetermined paleontological sensitivity) have the potential to significantly impact paleontological resources. Paleontological mitigation typically is recommended to reduce any negative impacts to paleontological resources to less than significant levels.

The purpose of the impact analysis is to determine which (if any) of the proposed Project-related earthwork activities may disturb potentially fossil-bearing geologic units, and where and at what depths this earthwork will occur. The paleontological impact analysis involved analysis of available project documents, and comparison with geological and paleontological data gathered during the records searches and literature review.

3.0 Results

3.1 Results of the Records Searches and Literature Review

3.1.1 Project Geology

Geologic setting: The Project site is located within the Perris Block of the Peninsular Ranges Geomorphic Province (English, 1926; Norris and Webb, 1990). This structural block is surficially expressed as a relatively low relief, weathered basin punctuated by hills and small mountains, and is surrounded by the Sana Ana Mountains to the west and south, the San Jacinto Mountains to the east, and the San Gabriel and San Bernardino Mountains to the north. The Perris Block is a fault-controlled region, with the San Jacinto Fault to the northeast and the Elsinore Fault Zone to the southwest. Faulting is responsible for the uplift of the surrounding mountain ranges, and the down drop of the Perris Block, and, locally, for the formation of the Elsinore-Temecula trough during the Pleistocene (Mann, 1955). As a consequence, the surrounding mountain ranges are actively being eroded, and the sediments derived from this erosion are being deposited in the basin lowlands as alluvial fans and/or stream channel deposits. These surficial deposits overlie a deeply weathered mass of Cretaceous plutonic igneous rocks of the Peninsular Ranges Batholith and older metasedimentary basement rocks.

Project-specific geology: The Project site lies just north of the Wildomar Fault, part of the Elsinore Fault Zone, and is primarily underlain by the sandstone member of the middle to late Pleistocene-age (approximately 650,000 to 125,000 years old) Pauba Formation (Qps) (Kennedy et al., 2003; Morton and Miller, 2006; NOVA, 2019). The sandstone member of the Pauba Formation generally consists of brown, moderately to well indurated, cross-bedded siltstone and sandstone with sparse cobble and boulder conglomerate horizons (Kennedy et al., 2003; Morton and Miller, 2006). In addition, based on geologic mapping of the site, the sandstone member of the late Pliocene- to middle Pleistocene-age (approximately 3.5 million to 650,000 years old) informal unit “sandstone and conglomerate of Wildomar area” (or, “sandstone of Wildomar area”; QTws) appears to underlie the Pauba Formation at relatively shallow depths within the Project site. This geologic unit generally consists of pale yellowish green, friable, caliche-rich, medium-grained sandstone (Kennedy et al., 2003; Morton and Miller, 2006). According to the geotechnical investigation report, the Pauba Formation is overlain in areas of previous site development by 1 to 11 feet of silty and sandy artificial fill (NOVA, 2019).

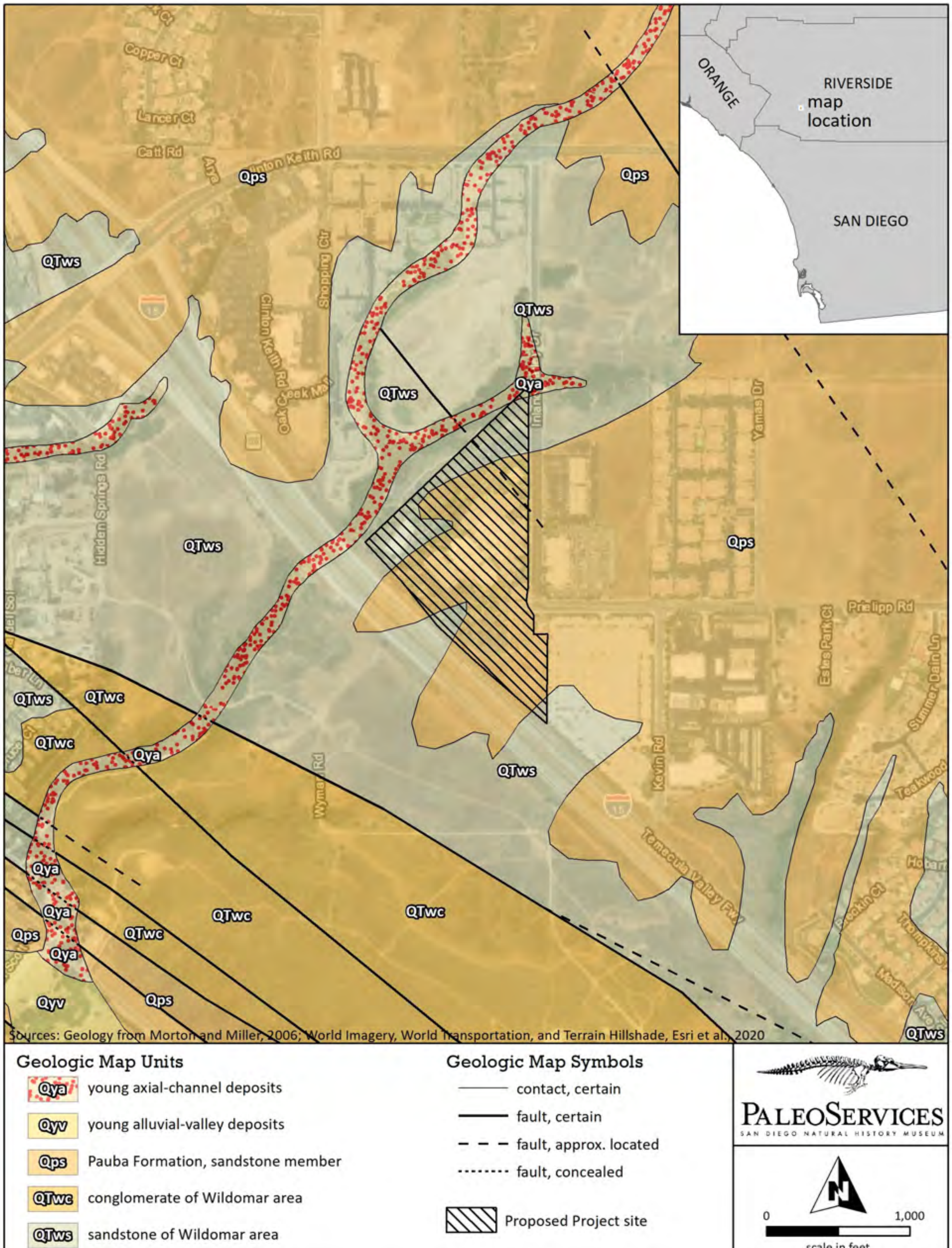

Figure 3: Geologic Map, Inland Valley Medical Center Expansion, City of Wildomar, Riverside County, California

3.1.2 Project Paleontology

A records search request of paleontological collections data at the WSC generated a response that there is one recorded WSC fossil collection locality within a one mile radius of the Project site, which was documented in sandstone deposits of the Pauba Formation during construction of the Grizzly Ridge residential development, located approximately 0.75 miles south of the Project site (WSC, 2020; Appendix). This locality produced fossil remains of a Pacific mastodon (*Mammut pacificus*).

An internal records search of the paleontological collections data at the SDNHM determined that there are no SDNHM fossil collection localities known from within a one mile radius of the Project site (SDNHM unpublished paleontological collections data). However, there are a total of four localities from the Pauba Formation documented within an expanded 5-mile radius of the Project site. Two of these localities (SDSNH Localities 4564 and 4565) were recovered during paleontological monitoring of construction of the Copper Creek housing development, located 1.75 miles south of the Project site, along the west side of Washington Avenue north of Magnolia Street/Nighthawk Way in the City of Murrieta. A partial dentary of an extinct camel (*Camelops* sp.) and a molar and tusk fragments of a mammoth (*Mammuthus* sp.) were recovered from these localities. Two additional localities (SDSNH Localities 5522 and 5522) were recovered during paleontological monitoring of construction of the Meadowlane housing development, located 3.9 miles southeast of the Project site, east of the intersection of Adams Avenue and Hawthorne Street in central Murrieta. Fossil remains of an extinct horse (*Equus* sp.) were recovered from these localities, including a partial skull with upper cheek teeth, a lower molar, upper cheek tooth fragments, and a partial scapula. A partial vertebra of an unidentified mammal was also recovered.

Additional fossil localities producing significant vertebrate fossils have been documented from the Pauba Formation in western Riverside County. The Pauba Formation produced a large middle to late Irvingtonian North American Land Mammal Age (NALMA) (middle to late Pleistocene) vertebrate fauna from a composite locality located east of I-15 and south of Santa Gertrudis Creek, approximately 7 miles southeast of the Project site (Pajak et al., 1996). This composite locality produced remains of ground sloth (*Paramylodon harlani*), pocket gopher (*Thomomys bottae*), vole (*Microtus* sp.), sabertoothed cat (*Smilodon fatalis*), horse (*Equus bautistensis*), tapir (*Tapirus californicus*), deer (*Odocoileus* sp.), pronghorn (*Antilocapra* sp.), and mammoth (*Mammuthus* sp. cf. *M. meridionalis* or *M. imperator*) (Pajak et al., 1996). Also recovered from the Pauba Formation elsewhere in western Riverside County are fossil remains of land snail (*Succinea* sp.), stickleback (*Gasterosteus aculeatus*), chub (*Gila* sp.), toad (*Bufo* sp.), frog (*Rana* sp.), pond turtle (*Clemmys* sp.), side-blotched lizard (*?Uta stansburiana*), skink (*Eumeces* sp.), kingsnake (*Lampropeltis* sp.), rattlesnake (*Crotalus* sp.), unidentified birds (Aves), rabbit (*Lepus* sp.), cottontail (*Sylvilagus* sp.), shrew (*Sorex* sp.), ground squirrel (*Ammospermophilus* sp.), kangaroo rat (*Dipodomys* sp.), pocket mouse (*Perognathus* sp.), harvest mouse (*Reithrodontomys* sp.), deer mouse (*Peromyscus* sp.), wood rat (*Neotoma* sp.), fox (*Vulpes* sp.), camel (*Camelops* sp.), llama (*Hemiauchenia* sp.), and mastodon (*Mammut* sp.) (Jefferson, 2010; Pajak et al., 1996; Reynolds and Reynolds, 1990b).

Strata referred to the informal “sandstone of Wildomar area” geologic unit, meanwhile, have produced vertebrate fossil assemblages representative of the late Blancan NALMA (late Pliocene and earliest Pleistocene) and the early to middle Irvingtonian NALMA (early to middle Pleistocene). Vertebrate fossils have been recovered from the “sandstone of Wildomar area” in a series of localities from exposures located along the northeast side of I-15 between Nutmeg Street and Los Alamos Road, between 1 and 3 miles southeast of the Project site (Bell, 1993; Pajak et al., 1996; Reynolds et al., 1990; Reynolds and Reynolds, 1990a; Scott and Cox, 1993). The late Blancan fauna includes frogs (*Rana* sp., *Hyla* sp.), toad (*Bufo* sp.), salamander (Plethiodontinae), giant tortoise (*Geochelone* sp.), pond turtle (*?Clemmys* sp.), whipsnake (*Masticophis* sp.), gopher snake (*Pituophis melanoleucus*), rattlesnake (*Crotalus* sp.), mole (cf. *Scapanus* sp.), rabbit (Leporinae), pocket gopher (*Thomomys bottae*), kangaroo rat (*?Dipodomys* sp.), pocket mouse (*Perognathus* sp.), deer mouse (*Peromyscus* sp.), wood rat (*Paraneotoma fossilis*), cotton rat (*Sigmodon* sp.), vole (*Mimomys parvus*), coyote (*Canis latrans*), horse (*Equus* sp.), and pronghorn (*Antilocapra* sp.) (Reynolds and Reynolds, 1990a). The diverse Irvingtonian fauna includes stickleback (*Gasterosteus aculeatus*), spadefoot toad (*Scaphiopus* sp.), frog (*Rana* sp., *Hyla* sp.), toad (*Bufo* sp.), tortoise (*Geochelone* sp.), pond turtle (*?Clemmys* sp.), banded gecko (*Coleonyx variegatus*), horned lizard (*Phrynosoma* sp.), spiny lizard (*Sceloporus* sp.), side-blotched lizard (*Uta stansburiana*), whiptail lizard (*Cnemidophorus* sp.), skink (*Eumeces* sp.), alligator lizard (*Gerrhonotus*), legless lizard (*Anniella pulchra*), whipsnake or racer (*Masticophis* or *Coluber*), patch-nosed snake (*?Salvadora* sp.), ringneck snake (*Diadophis punctatus*), gopher snake (*?Thamnophis* sp.), kingsnake or ratsnake (Lampropeltinae), rattlesnake (*Crotalus* sp.), unidentified birds (Aves), bat (Vespertilionidae), mole (*Scapanus* sp.), shrew (*Sorex* sp.), cat (Felidae), skunk (cf. *Mephitis* sp.), weasel (*Mustela* sp. cf. *M. frenata*), badger (*Taxidea* sp.), wolf (*Canis* sp.), fox (*Vulpes* sp.), short-faced bear (*Arctodus simus*), squirrel (*Spermophilus* sp.), ground squirrel (*Ammospermophilus* sp.), chipmunk (cf. *Eutamias* sp.), pocket gopher (*Thomomys* sp.), pocket mouse (*Perognathus* sp.), kangaroo rat (*Dipodomys* sp.), deer mouse (*Peromyscus* sp.), grasshopper mouse (*Onychomys torridus*), wood rat (*Neotoma* sp.), harvest mouse (*?Reithrodontomys* sp.), cotton rat (*Sigmodon* sp.), vole (*Cleithrionomys* sp., *Microtus* sp.), porcupine (*Coendu cascoensis*), rabbit (*Hypolagus* sp., *Lepus* sp., *Sylvilagus* sp.), camel (*Camelops* sp.), llama (*Hemiauchenia* sp.), antelope (*?Tetrameryx* sp.), pronghorn (*Antilocapra* sp.), deer (*Odocoileus* sp.), peccary (*Platygonus bicalcaratus*), horse (*Equus* sp. cf. *E. bautistensis*, *Equus* sp.), mastodon (*Mammut* sp.), mammoth (cf. *Mammuthus* sp.), and ground sloth (*Megalonyx wheatleyi*) (Bell, 1993; Reynolds et al., 1990; Scott and Cox, 1993). The fauna also includes freshwater clams and snails (*Pisidium* sp., *Gyraulus* sp., *Amnicola* sp., *Physa* sp., *Vertigo* sp., *Pupilla* sp., *Succinea* sp., *Vallonia* sp.) (Reynolds et al., 1990).

3.2 Results of the Paleontological Field Survey

As observed during the paleontological field survey, the topographic surface of the Project site slopes imperceptibly downhill from north to south, and primarily lies level with or just above I-15 and Inland Valley Drive. The central portion of the Project site is occupied by several existing large 1 to 2 story buildings, while the majority of the remaining Project site is covered by paved roadways, surface parking, a ground-level helipad, and landscaping (Figure 4). The southern portion of the site is occupied by an elevated pad that appears to be composed of fill. The only outcrops of native sedimentary strata (not previously disturbed or displaced) identified during the survey were located in the northern portion of the Project site, along Inland Valley Drive (at the northeast corner of the northern parking lot) and in the steep slope along the northwestern border of the site.

Only strata of the “sandstone of Wildomar area” were encountered in the northern portion of the Project site, confirming the published geologic mapping of Kennedy et al. (1993) and Morton and Miller (2006). Observed lithologies consisted of well indurated pale olive and pale reddish brown silty fine- to medium-grained sandstones, and poorly indurated brown and tan poorly sorted coarse- to very-coarse grained gritty sandstones with pebble lenses (Figures 5 and 6). The Pauba Formation was not directly observed within the Project site due to the presence of pavement, existing structures, landscaped vegetation, natural scrub vegetation, and artificial fill.

No fossils were encountered during the paleontological field survey.

Figure 4. Overviews of the existing development at the Project site. <u>Top:</u> View facing southeast toward existing Building B-H, with the ground-level helipad visible in the foreground. <u>Bottom left:</u> View of the rear of existing Building I. <u>Bottom right:</u> View of the southern parking lot facing south towards I-15.

Figure 5. Strata of the “sandstone of Wildomar area” located in a small exposure along Inland Valley Drive, with finer-grained silty sandstones visible at left, and a lens of coarse-grained sandstone with grit and pebbles at right.

Figure 6. Strata of the “sandstone of Wildomar area” as exposed in the steep slope along the northwestern border of the Project site, consisting of tan, massive, poorly consolidated, coarse- to very coarse-grained gritty sandstone.

3.3 Results of the Paleontological Resource Assessment

The County of Riverside General Plan (County of Riverside, 2015; incorporated by the City of Wildomar) assigns the sedimentary deposits in the Project site and vicinity a high paleontological potential/sensitivity (category A). The high paleontological potential/sensitivity (category A) rating assigned to the Pauba Formation and "sandstone of Wildomar area" by the County of Riverside is supported by the known occurrence of fossils in the vicinity of the Project site (see Section 3.1.2 and Appendix), and elsewhere in western Riverside County. Unmapped artificial fill deposits present within the Project site (overlying the Pauba Formation in areas of previous construction) are assigned a low paleontological potential/sensitivity rating, because any fossil remains present within artificial fill have been displaced from their original stratigraphic context (Figure 7).

3.4 Results of the Paleontological Impact Analysis

As currently outlined, the Project proposes to construct a new 7-story, 232,626 SF tower, modify existing Building I, modify existing Building A, and construct a new CUP, all located within the existing IVMC site. As part of the Project, Buildings B-H and C will be demolished for the creation of new surface parking and the new tower, respectively. An analysis of the proposed Project components, based on the preliminary grading plans for the Project, is provided below and summarized in Table 1:

<u>Phase 1 – Enable and Make-Ready</u>: During Phase 1, existing Building C will be demolished, and existing curbs, gutters, asphalt, and trees will be removed to prepare the site for construction. These activities are anticipated to take place entirely within previously disturbed sediments (artificial fill) and/or topsoil. Similarly, reconfiguration of the parking area and landscaping improvements are anticipated to require little or no excavation exceeding the depths of artificial fill and topsoil. The construction of stormwater retention basins, however, is anticipated to require excavation extending up to 10 feet below ground surface (bgs). In addition, any subgrade site utility upgrades will require excavation estimated to extend several feet bgs.

Construction of stormwater retention basins and any subgrade site utility upgrades have the potential to impact strata of the Pauba Formation and underlying "sandstone of Wildomar area."

<u>Phase 2 – Hospital Expansion, Renovation of Existing Buildings, and Central Utility Plant</u>: During Phase 2, the new tower and CUP will be constructed. Based on the recommendations for remedial grading in the geotechnical investigation report (NOVA, 2019), the upper 5 feet or 3 feet below the deepest planned foundation element (whichever is greater) of sediment should be removed within the tower limits and extending laterally outward at least 5 feet from the tower footprint. Excavation of elevator pits, foundation footings, and subgrade utilities are anticipated to be the deepest required earthwork for the tower. Remedial grading is also recommended for the new CUP, extending below the depth of any existing fill and laterally at least 3 feet beyond the CUP footprint. Modifications to Buildings A and I are not anticipated to require any subgrade excavations, as they are designed to modify existing at-grade or above grade structures. Finally, construction of the south surface parking and the south section of the ring road is anticipated to require minor grading extending up to several feet bgs.

Construction of the new tower will certainly impact the Pauba Formation and underlying "sandstone of Wildomar area." Construction of the new CUP has the potential to impact the Pauba Formation and underlying "sandstone of Wildomar area." Construction of the south surface parking lot and south section of the ring road have the potential to impact the Pauba

Formation and underlying "sandstone of Wildomar area" where excavations exceeding 2 feet bgs are required, based on the presence of at least 2 feet of artificial fill in this area.

Phase 3 – Demolition of Building B-H, Eastern Parking Area and Associated Landscape: During Phase 3, existing Building B-H and the existing CUP will be demolished, the east parking lot will be constructed, and new landscaping will be installed. These activities are all anticipated to take place entirely within previously disturbed sediments (artificial fill) and/or topsoil. The refresh of the east façade of Building A is expected to take place at-grade or above grade, and will therefore not require any subgrade excavations. Finally, construction of a stormwater retention basin at the location of the existing ground-level helipad will involve excavations extending up to 6 feet bgs.

Construction of the new stormwater retention basin in the northern portion of the Project site has the potential to impact the Pauba Formation and underlying "sandstone of Wildomar area."

Table 1. Summary of Project components, anticipated earthwork and associated impacts, and paleontological monitoring recommendations.

Project Components	Anticipated Earthwork	Impact Analysis	Monitoring recommended?
Phase 1 – Enable and Make-Ready			
Demolish Building C	No significant earthwork anticipated	No impacts anticipated	No
Removal of curbs, gutters, asphalt paving, and trees	No significant earthwork anticipated	No impacts anticipated	No
Reconfigure parking area	No significant earthwork anticipated	No impacts anticipated	No
Construct stormwater retention basins	Excavation of basins	Impacts anticipated	Yes
Upgrade site utilities	Trenching for any subgrade utilities	Impacts anticipated	Yes
Landscape improvements	No significant earthwork anticipated	No impacts anticipated	No
Phase 2 – Hospital Expansion, Renovation of Existing Building, and Central Utility Plant			
New tower construction	Excavation for building foundation, subgrade utilities, and elevator pit	Impacts anticipated	Yes
Renovation of Building A	No significant earthwork anticipated	No impacts anticipated	No
Renovation of Building I	No significant earthwork anticipated	No impacts anticipated	No
Construct new CUP	Grading for the creation of a level building pad and the installation of subgrade utilities	Impacts anticipated	Yes
Construct new south surface parking and south section of ring road	Minor grading anticipated	Impacts possible for earthwork extending more than 2 feet bgs	No (<2 ft bgs); Yes (>2 ft bgs)
Phase 3 – Demolition of Building B-H, Eastern Parking Area and Associated Landscape			
Demolish Building B-H and existing CUP	No significant earthwork anticipated	No impacts anticipated	No
Refresh Building A façade	No significant earthwork anticipated	No impacts anticipated	No
Construct east parking lot	No significant earthwork anticipated	No impacts anticipated	No
Construct surface stormwater retention basin	Excavation of basin	Impacts anticipated	Yes
Landscaping	No significant earthwork anticipated	No impacts anticipated	No

Figure 7: Paleontological Potential Map, Inland Valley Medical Center Expansion, City of Wildomar, Riverside County, CA

4.0 Recommendations & Conclusions

Implementation of a paleontological mitigation program, in the form of paleontological monitoring, is recommended for earthwork at the Project site that will directly impact previously undisturbed deposits of the Pauba Formation or the underlying "sandstone of Wildomar area." Implementation of the following mitigation measures will reduce any Project-related impacts to paleontological resources to a level that is less than significant. The below outlined mitigation measures are based on established industry best practices (Murphey et al., 2019).

4.1 Mitigation Measures

1. Prior to the start of earthwork, a qualified Project Paleontologist shall be retained to oversee the paleontological monitoring program and shall attend the pre-construction meeting to consult with Project contractors concerning excavation schedules, paleontological field techniques, and safety issues. In addition, a professional repository shall be designated to receive and curate any discovered fossils.

   A qualified Project Paleontologist is defined as an individual with an M.S. or Ph.D. in paleontology or geology that is experienced with paleontological procedures and techniques, who is knowledgeable in the geology and paleontology of Riverside County, and who has worked as a paleontological mitigation project supervisor for at least one year.

   A professional repository is defined as a recognized paleontological specimen repository (e.g., an AAM-accredited museum or university) with a permanent curator, and should be capable of storing fossils in a facility with adequate security against theft, loss, damage, fire, pests, and adverse climate conditions.

2. A paleontological monitor shall be on-site during all earthwork operations impacting previously undisturbed deposits of the Pauba Formation (Qps) or underlying "sandstone of Wildomar area" (QTws). The paleontological monitor shall be equipped to salvage fossils as they are unearthed, to avoid construction delays, and to remove samples of sediments that are likely to contain small fossil invertebrates and vertebrates. Monitors shall be empowered to temporarily halt or divert equipment to allow removal of abundant or large specimens. Paleontological monitoring may be reduced (e.g., part-time monitoring or spot-checking) or eliminated, at the discretion of the Project Paleontologist and in consultation with appropriate agencies (e.g., Project proponent, City of Wildomar representatives). Changes to the paleontological monitoring schedule shall be based on the results of the mitigation program as it unfolds during site development, and current and anticipated conditions in the field.

   A paleontological monitor is defined as an individual with a college degree in paleontology or geology who has experience in the recognition and salvage of fossil materials. The paleontological monitor should work under the direction of the Project Paleontologist.

3. If fossils are discovered, the Project Paleontologist (or paleontological monitor) shall make an initial assessment to determine their significance. All identifiable vertebrate fossils (large or small) and uncommon invertebrate, plant, and trace fossils are considered to be significant and shall be recovered (SVP, 2010). Representative samples of common invertebrate, plant, and trace fossils shall also be recovered. Although fossil salvage can often be completed in a relatively short period of time, the Project Paleontologist (or paleontological monitor) shall be allowed to temporarily direct, divert, or halt earthwork at his or her discretion during the initial assessment phase if additional time is required to salvage fossils. If it is determined by the Project Paleontologist that the fossil(s) should be recovered, the recovery shall be completed in a timely manner. Some fossil specimens (e.g., a large mammal skeleton) may require an

extended salvage period. Because of the potential for the recovery of small fossil remains (e.g., isolated teeth of small vertebrates), it may be necessary to collect bulk-matrix samples for screen washing.

4. In the event that fossils are discovered during a period when a paleontological monitor is not on site (i.e., an inadvertent discovery), earthwork within the vicinity of the discovery site shall temporarily halt, and the Project Paleontologist shall be contacted to evaluate the significance of the discovery. If the inadvertent discovery is determined to be significant, the fossils shall be recovered, as outlined in Mitigation Measure 3.
5. Fossil remains collected during monitoring and salvage shall be cleaned, repaired, sorted, taxonomically identified, and cataloged as part of the mitigation program. Fossil preparation may also include screen-washing of bulk matrix samples for microfossils or other laboratory analyses (e.g., radiometric carbon dating), if warranted in the discretion of the Project Paleontologist. Fossil preparation and curation activities may be conducted at the laboratory of the contracted Project Paleontologist, at an appropriate outside agency, and/or at the designated repository, and shall follow the standards of the designated repository.
6. Prepared fossils, along with copies of all pertinent field notes, photos, and maps, shall be curated at a professional repository (e.g., Western Science Center, San Diego Natural History Museum). The Project Paleontologist shall have a written repository agreement with the professional repository prior to the initiation of mitigation activities.
7. A final summary report shall be completed at the conclusion of the monitoring and curation phases of work, and shall summarize the results of the mitigation program. A copy of the paleontological monitoring report should be submitted to the City of Wildomar and to the designated museum repository. The report and specimen inventory, when submitted to the City of Wildomar with confirmation of the curation of recovered specimens into an established, accredited repository, will signify completion of the program to mitigate impacts to paleontological resources.

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Appendix

Records Search Results: Western Science Center

WESTERN SCIENCE CENTER

San Diego Natural History Museum
Katie McComas
P.O. Box 121390
San Diego, CA 92101

November 3, 2020

Dear Ms. McComas,

This letter presents the results of a record search conducted for the Inland Valley Medical Center Project in the city of Murrieta, Riverside County, California. The project site is located east of Interstate 15, west of Inland Valley Drive, and south of Clinton Keith Road in Section 6 of Township 7 South, Range 3 West on the Murrieta CA USGS 7.5 minute topographic quadrangle.

The geologic units underlying the project area is mapped entirely as sandstone deposits dating from the Late Pliocene to the Pleistocene with the majority of the project area falling on sandstone associated with the Pleistocene Pauba Formation (Kennedy & Morton, 1993). Pleistocene sedimentary units are considered to be of high paleontological sensitivity, and the Pauba Formation in particularly is well documented to be paleontologically sensitive. The Western Science Center does not have localities within the project area, but does have a fossil locality associated with the Principe Collection within a one mile radius. The Principe Collection is a salvage collection that does not have precise locality data or a report, but has been identified to the project area in which it was found. Principe Locality 12 is associated with the Grizzly Ridge Housing Development in Murrieta and contained multiple fossil specimens including those associated with Pacific mastodon (*Mammut pacificus*).

Any fossils recovered from the Inland Valley Medical Center Project area would be scientifically significant. Excavation activity associated with development of the area has the potential to impact the paleontologically sensitive Pleistocene sedimentary units and it is the recommendation of the Western Science Center that a paleontological resource mitigation plan be put in place to monitor, salvage, and curate any recovered fossils associated with the current study area.

If you have any questions, or would like further information about the Principe Collection, please feel free to contact me at dradford@westerncentermuseum.org

Sincerely,

Darla Radford
Collections Manager

2345 Searl Parkway ♦ Hemet, CA 92543 ♦ phone 951.791.0033 ♦ fax 951.791.0032 ♦ WesternScienceCenter.org