May 17, 2024; Revised March 31, 2025

Meaghan Truman
EPD Solutions, Inc.
3333 Michelson Drive, Suite 500
Irvine, California 92612

Subject: Paleontological Assessment Review and Update for the Harvest Landing Retail Center & Business Park Project, City of Perris, Riverside County, California (APNs 305-060-036, -037, and -042; 305-070-004, -007, -008, and -088; 305-090-015 through -019, -026, -028, -030, -032, and -055 through -059; 305-100-008, -009, and -028; 305-110-001 through -007, -015, -016, -021 through -027, and -032 through -035; 305-120-004 through -008 and -020 through -026; 305-130-001 through -006 and -009; 305-140-012, -024 through -027, -031, -032, -034, -040, -041, -049, -050, and -052 through -061; 305-160-001, -002, -003, and -022 through -030; 305-170-018; 305-190-014, -019, -020, -028 through -031, and -033; 305-220-011, -020, -021, and -059 through -062; and 305-240-027)

Dear Ms. Truman:

This review and update of prior paleontological assessment reporting has been completed for the Harvest Landing Retail Center & Business Park Project, located along the east side of Interstate 215 in the city of Perris in Riverside County, California (Figures 1 and 2, attached). The project is situated within Sections 18 and 19 of Township 4 South, Range 3 West on the U.S. Geological Survey (USGS) (7.5-minute) *Perris*, *California* topographic quadrangle map (see Figure 2), and consists of 113 parcels totaling 358.28 acres. The development is proposed to include industrial and commercial uses, as well as necessary infrastructure improvements.

Updated research is utilized here to help assess the project's potential to impact significant paleontological resources. The scope of work included a review of existing records regarding recorded fossil localities potentially near the project site, the project site's regulatory and geologic setting, and the likelihood of the geologic unit(s) mapped at the project site to yield paleontological resources. This revised letter includes new geotechnical investigation reporting by Southern California Geotechnical (Sandoval et al. 2024).

Background

Original Assessment by Cogstone

In 2007, Cogstone Resource Management, Inc. (Cogstone), completed an Archaeological and Paleontological Resources Assessment for the Harvest Landing Project that totaled approximately 341 acres (Gust and Scott 2007). Cogstone indicated that most of the Harvest Landing project site is mapped as Pleistocene-aged very old alluvial fan deposits that are known to yield significant paleontological resources in Riverside and San Bernardino Counties. The report concluded that, based on a paleontological locality record search provided by the San Bernardino County Museum (SBCM) and an inventory of Pleistocene fossil localities throughout the region, a high potential exists for significant paleontological resources to be adversely impacted below a depth of six feet, and accordingly recommended full-time monitoring of earth disturbance activities starting at six feet deep at the Harvest Landing project site. The source of the six-foot depth threshold was not specifically identified, however.

Harvest Landing Specific Plan Draft EIR

The conclusions and recommendations of the 2007 Archaeological and Paleontological Resources Assessment were incorporated in the Harvest Landing Specific Plan Final Environmental Impact Report (EIR; The Planning Center 2008). Under Impact 5.5-3 in the Final EIR, seven mitigation measures are required for execution to reduce potential impacts to paleontological resources to a less than significant level. Notably, implementation for full-time monitoring was required beginning at six feet deep below the original ground surface in undisturbed sediments.

The Harvest Landing Specific Plan was subsequently adopted by the City of Perris City Council in April 2011.

Supplemental Assessment by Cogstone

In 2019, Cogstone issued a supplement to their earlier assessment (Knight and Scott 2019). The purpose of the supplemental report was to "amend the Specific Plan and process a tentative tract map among other entitlements" for various uses and improvements. For the supplement, Cogstone solicited a paleontological locality records search from the Western Science Center (WSC) to add additional information. The negative results of the WSC records search did not add new paleontological data in addition to those discussed by Gust and Scott (2007). Knight and Scott (2019) concluded that the alluvial deposits mapped at the project site are similar to those in other places in the region that have produced many species of Pleistocene-aged mammalian fossils. They stated that most of these fossil localities were found deeper than eight feet below the surface. The source(s) of the eight-foot depth threshold was not specifically identified, however.

Knight and Scott (2019) applied the U.S. Department of Interior, Bureau of Land Management's (BLM) Potential Fossil Yield Classification (PFYC) System to the geologic formations mapped at the project (early Pleistocene-aged very old alluvial fan deposits and Holocene to late Pleistocene-aged valley deposits), and concluded sediments shallower than eight

feet had a low paleontological sensitivity, while sediments deeper than eight feet have a moderate but patchy potential for fossils. Knight and Scott (2019) recommended full-time monitoring to commence at a depth of eight feet, revising the recommendation of six feet stated by Gust and Scott (2007).

Current Assessment Update

Regional Geology

Geomorphically, the project site is mostly flat with a gentle eastward gradient, situated within the western side of Perris Valley. Geologically, the project site is mapped as well-indurated, sandy, early Pleistocene-aged, very old alluvial fan deposits (brown areas labeled "$Qvof_a$" on Figure 3, attached, after Morton 2001, 2003). A miniscule area of Holocene and late Pleistocene-aged young alluvial-valley deposits (area colored yellow and labeled "Qyv_{sa}" on Figure 3) are mapped at the very east edge of the project site, and are composed of unconsolidated gray silts and sands that overlie the very old alluvial fan deposits at a shallow, diminishing depth.

Project Site Geology

Pacific Soils Engineering, Inc., summarized geotechnical investigations that were conducted at the project site (Gray et al. 2005). Results from investigative borings and trenches indicate that the project site is variably topped with deposits of undocumented fill that overlie very old alluvial fan deposits. The very old alluvial fan deposits were found to consist of various shades of brown, fine-grained sandy silt and silty, fine to medium-grained sand, with carbonate deposits. The upper three to five feet of the very old alluvial fan deposits were noted as highly weathered. Boring logs demonstrate that silty sands typically overlie dark brown sandy silts at a depth of about 15 to 20 feet. Carbonate blebs were noted in only three borings, first appearing at depths of 7.5, 10, and 15 feet.

More recent geotechnical investigations are summarized in a report by Southern California Geotechnical, which includes multiple soil borings and infiltration tests to a depth of 50 feet (Sandoval et al. 2024). Sandoval et al. (2024) identified the presence of younger alluvium at the surface of the project site, particularly in areas generally south of Orange Avenue and east of Indian Avenue, ranging from 2.5 to 5.5 feet thick. The younger alluvium is characterized as loose to very dense silty fine sands, silty fine to medium sands, fine sandy silts, clayey fine sands, and occasional layers of very stiff fine sandy clays and silty clays.

Underlying the younger alluvium, and at the surface when not covered by young alluvium, is older alluvium, at least to the total depth explored. The older alluvium is described as consisting of loose to very dense silty sands with varying clay content, sandy silts with varying clay content, clayey sands with varying silt content, and clayey silts. Additionally, layers of very stiff to hard fine sandy clays and silty clays are present (Sandoval et al. 2024). Calcareous nodules were commonly present in undisturbed older alluvium, as shallow as two feet deep.

Sandoval et al. (2024) did not speculate on the geologic age of the alluvial deposits at the project site. Although Sandoval et al. (2024) described the surface of the project site as disturbed

as a result of tilling from past agricultural activities, disturbed soils or artificial fill soils are not recorded in their borings logs.

Paleontological Records Search

Two updated paleontological locality records searches by the WSC and the SBCM were solicited for the project. The records search by the WSC (Stoneburg 2023; attached) found that no fossil localities are known by the WSC in the area of the proposed project, however "Pleistocene alluvial units are considered to be highly paleontologically sensitive." In addition, Stoneburg (2023) indicated "Any fossils recovered from the Harvest Landing Specific Plan Project area would be scientifically significant. Excavation activity associated with development of the area has the potential to impact the paleontologically sensitive Pleistocene sediments 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."

Another paleontological locality records search was conducted by the SBCM (Kottkamp 2024; attached). While no localities were known from within one mile of the project site, significant fossils are known just 1.25 miles to the north-northeast (SBCM localities 5.3.298 – 300), consisting of the bones of a pond turtle (*Actinemys* cf. *pallida*), Pacific mastodon (*Mammut pacificus*), extinct horse (*Equus* sp.), and extinct bison (*Bison* sp.). Kottkamp (2024) notes that these late Pleistocene-aged (Rancholabrean) fossils were recovered as redeposited materials in the Perris Valley Storm Drain as a result of a thunderstorm. In this area of Perris, the Perris Valley Storm Drain cuts through what is geologically mapped by Morton (2003) as Holocene and late Pleistocene-aged young alluvial-valley deposits ("Qyv_{sa}" on Figure 3). While Kottkamp did not speculate on the depositional scenario or depths associated with the fossils, presumably they were eroded out of the storm drain walls and (partially?) reburied. This would indicate that fossil-bearing, late Pleistocene-aged deposits underlie Holocene cover sediments at a relatively shallow depth in this area. In their recent paper erecting the new mastodon species *Mammut pacificus*, Dooley et al. (2019) describe the mastodon remains that comprise SBCM locality 5.3.298: "Partial cranium with left and right tusks, M2 [second molar], and M3 [third molar], sacrum, and several additional vertebrae and ribs." Significantly, these remains were included as part of their analysis to distinguish a Pacific coast species of mastodon separate from the long-established species *Mammut americanum* found throughout North America (outside of California and Idaho).

Holocene alluvium is generally considered to be geologically too young to contain significant nonrenewable paleontological resources (*i.e.,* fossils) and thus is typically assigned a low paleontological sensitivity. Pleistocene (over 11,700 years old) alluvial and alluvial fan deposits in western Riverside County, however, are known to yield important terrestrial vertebrate fossils, such as mammoths, mastodons, giant ground sloths, horses, bison, camels, saber-toothed cats, and others (Jefferson 1991; Stoneburg 2023; Kottkamp 2024). These Pleistocene sediments are thus accorded a high paleontological resource sensitivity (City of Perris 2005; County of Riverside 2015).

City of Perris General Plan

The City of Perris has allocated requirements addressing paleontological resources in the Conservation Element of the City of Perris General Plan (City of Perris 2005:26–27 [Exhibit CN-7]). The Conservation Element "provides goals and policies as a framework for the management, preservation, and use of the City's resources" (City of Perris 2005). Goals, policies, and implementation measures specific to paleontological resources are as follows:

> **Measure IV.A.4**: In Area 1 and Area 2 shown on the Paleontological Sensitivity Map [Exhibit CN-7], paleontological monitoring of all projects requiring subsurface excavations will be required once any excavation begins. In Areas 4 and 5, paleontological monitoring will be required once subsurface excavations reach 5 feet in depth, with monitoring levels reduced if appropriate, at the discretion of a certified Project Paleontologist. (City of Perris 2005:47)

Based on the Paleontological Sensitivity Map (Exhibit CN-7) in the Conservation Element of the City's General Plan (City of Perris 2005), the Harvest Landing Retail Center & Business Park Project site is located within Area 1, which is defined by the presence of older Pleistocene alluvium mapped at the surface and requires paleontological monitoring once any excavation begins.

Conclusions

This paleontological assessment update letter found that no paleontological resources are known from within or in the immediate area of the Harvest Landing Retail Center & Business Park Project site, however redeposited fossil bones of late Pleistocene age were discovered just over one mile to the north-northeast in a storm water channel. The presence of these fossils demonstrates that Holocene-aged surficial deposits transition to older deposits of late Pleistocene age at a relatively shallow depth(s). Geologically, the project site is mapped as early Pleistocene very old alluvial fan deposits. The very old alluvial fan deposits have the potential to yield Pleistocene vertebrate fossils, based on regional data and the nearby SBCM localities at the storm water channel. These conclusions do not differ significantly from Cogstone's reporting (Gust and Scott 2007; Knight and Scott 2019).

Gust and Scott (2007) stated the very old alluvial fan deposits mapped at the project site have a high potential to contain significant fossils and recommended an excavation depth of six feet to initiate full-time monitoring. The six-foot depth threshold was based on information from and as a result of the records search, however, no data or citation was provided to correlate depths and fossil potential. Furthermore, the inclusion of fossils from the Pauba Formation as an equivalent source of paleontological resources may not be appropriate. While the Pauba Formation and the very old alluvial fan deposits are approximately similar in age, the Pauba Formation consists of tectonically deformed and uplifted strata and is known to produce fossils from natural outcrops.

Cogstone (Knight and Scott 2019) employed the BLM's PFYC System to assign levels of paleontological sensitivity to the formations mapped at the project site, and determined deposits above eight feet deep had a low sensitivity, while deeper deposits "have a moderate to patchy potential for fossils (PFYC 3a) due to similar deposits producing fossils near the project area" despite no new data being provided to buttress this change of sensitivity from Gust and Scott (2007). While the PFYC System is sound, the appropriateness of using federal guidelines for the project is questionable since the federal government is not the regulatory agency. In addition, the PFYC System does not assign depth thresholds to its sensitivity levels. The eight-foot threshold Knight and Scott (2019) propose is from their re-interpretation(?) of the same fossil data provided in Gust and Scott (2007). In summary, Knight and Scott (2019) did not supply any new data, other than a letter from the WSC with negative results (no fossils nearby).

The City of Perris General Plan Conservation Element provides paleontological requirements for monitoring start depths at different areas of the city, depending on the mapped geology. In accordance with the geology mapped at the project site, the assigned start depth is from the surface. The findings and conclusions contained herein do not disagree with this requirement.

Recommendations

Based on the conclusions above, it is recommended that the project adhere to the requirements of the City of Perris General Plan Conservation Element for paleontological resources. Therefore, full-time paleontological monitoring is still required in undisturbed very old alluvial fan deposits at the project site, however, the start depth should be from the surface, in accordance with the City of Perris General Plan Conservation Element. A paleontological resource impact mitigation program (PRIMP) is recommended for the project. The PRIMP should be approved by the City of Perris prior to the approval of any grading permits.

If you have any questions regarding this letter, please contact our office.

Sincerely,



Todd Wirths, M.S., P.G. No. 7588
Senior Paleontologist, California Professional Geologist

Attachments:

Attachment A – Figures 1 through 3
Attachment B – Fossil Locality Records Search Letters

References

City of Perris. 2005. Conservation Element, City of Perris General Plan. Electronic document, https://www.cityofperris.org/departments/development-services/general-plan.

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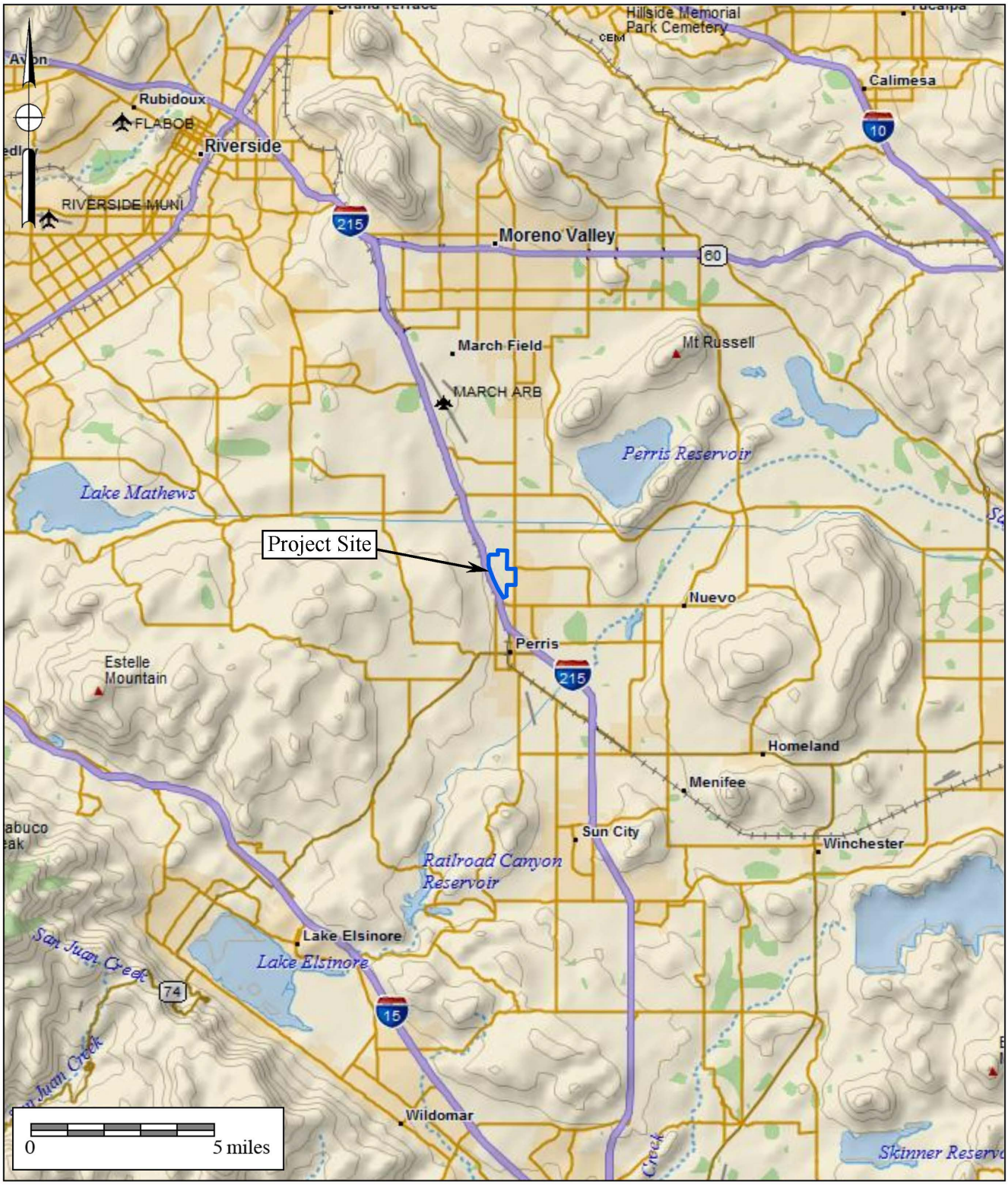
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Stoneburg, B.E. 2023. Paleontological locality record search letter for the Harvest Landing Specific Plan. Unpublished letter prepared for BFSA Environmental Services, a Perennial Company, Poway, California, by the Western Science Center, Hemet, California. (attached)

ATTACHMENT A

Figures 1 through 3

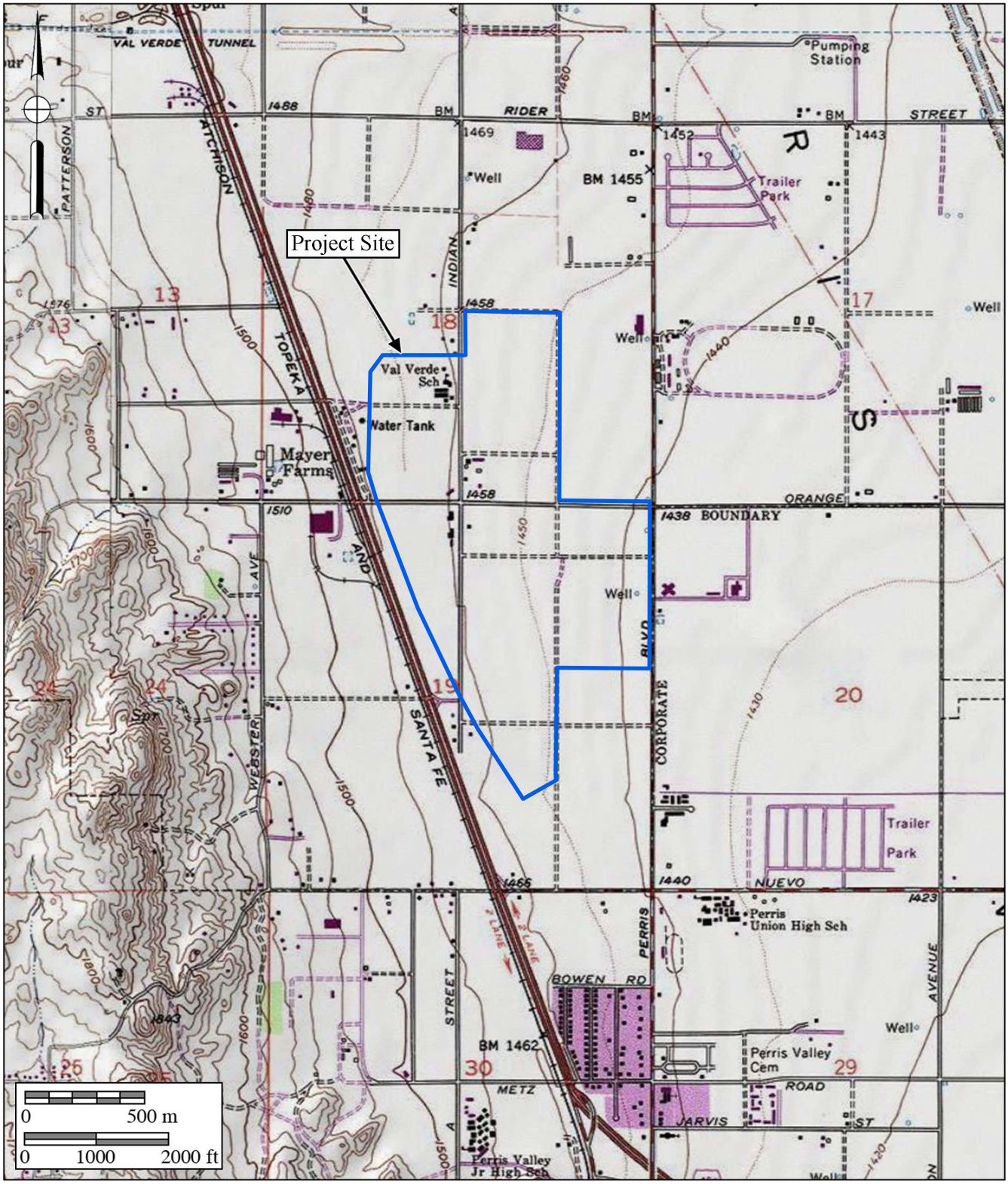


BFSA Environmental Services
A Perennial Company

Figure 1
General Location Map

The Harvest Landing Retail Center & Business Park Project

DeLorme (1:250,000 series)

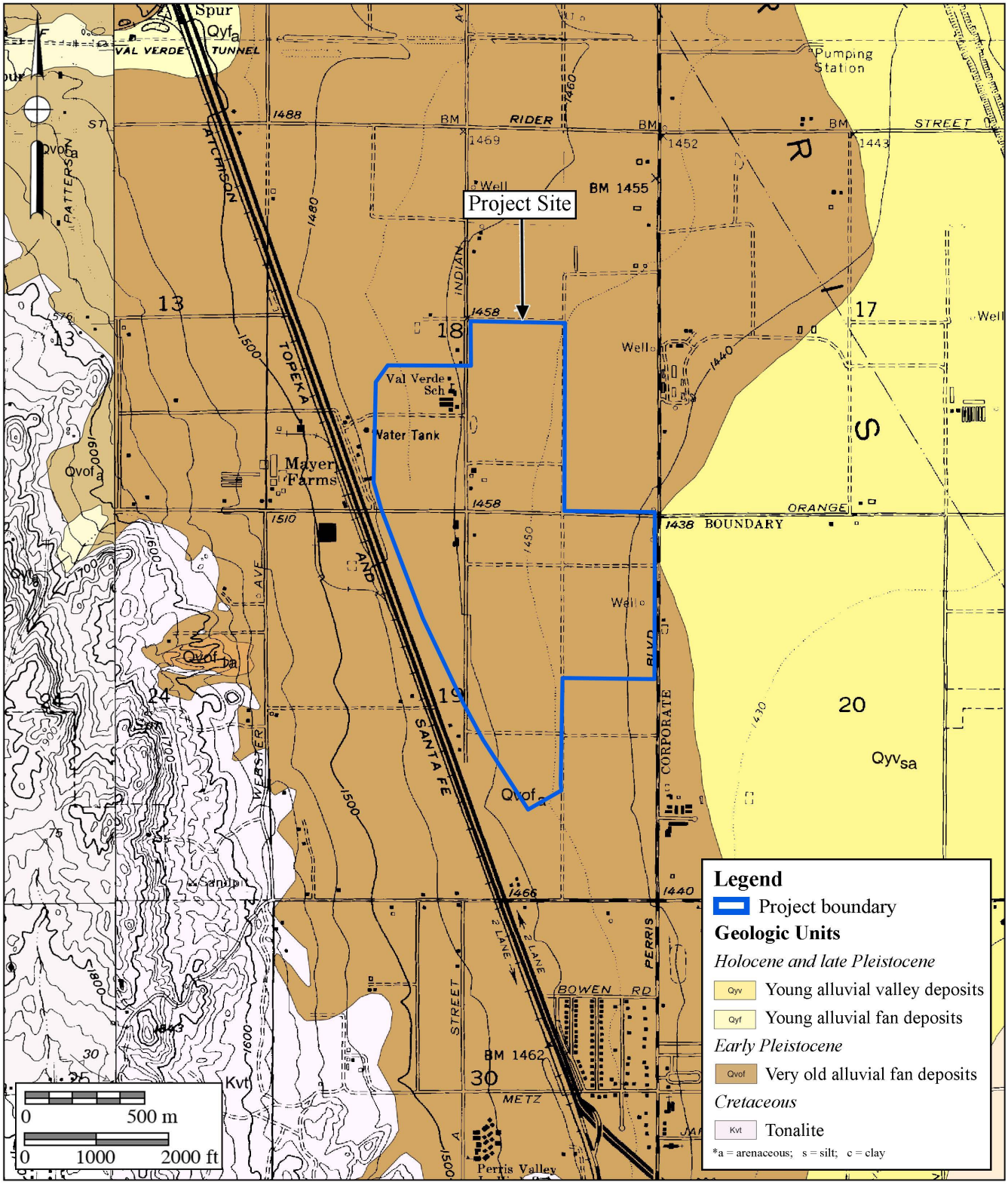


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Figure 2
Project Location Map

The Harvest Landing Retail Center & Business Park Project

USGS *Perris* and *Steele Peak* Quadrangles (7.5-minute series)



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Figure 3
Geologic Map

The Harvest Landing Retail Center & Business Park Project

Geology after Morton (2001 and 2003)

ATTACHMENT B

Fossil Locality Records Search Letters:
Western Science Center and
San Bernardino County Museum

WESTERN SCIENCE CENTER

December 5th, 2023

BFSA Environmental Services
Todd Wirths
14010 Poway Road, Suite A
Poway, California 92064

Dear Mr. Wirths,

This letter presents the results of a record search conducted for the Harvest Landing Specific Plan Project located in the City of Perris, Riverside County, California. The project site is located between Interstate 215 and N Perris Blvd in Township 4 South, Range 3 West, Sections 18 and 19 on the *Perris, CA* USGS 7.5 minute quadrangle.

The geologic units underlying this project are mapped primarily as very old Pleistocene-aged alluvial fan deposits (Morton, 2003). Pleistocene alluvial units are considered to be highly paleontologically sensitive. The Western Science Center does not have any localities within one mile of the project area.

Any fossils recovered from the Harvest Landing Specific Plan Project area would be scientifically significant. Excavation activity associated with development of the area has the potential to impact the paleontologically sensitive Pleistocene sediments 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, please feel free to contact me at bstoneburg@westerncentermuseum.org.

Sincerely,

Brittney Elizabeth Stoneburg, MSc
Collections Manager

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

SAN BERNARDINO COUNTY

Museum
Division of Earth Science

David Myers
Director

Scott Kottkamp
Curator of Earth Science

1 May 2024

BFSA Environmental Services
Attn: Todd Wirths
14010 Poway Rd.
Poway, CA 92064

PALEONTOLOGY RECORDS REVIEW for proposed site of Harvest Landing Specific Plan, Perris, Riverside County, California

Dear Mr. Wirths,

The Division of Earth Science of the San Bernardino County Museum (SBCM) has completed a record search for the above-named project in Riverside County, California. The proposed project site (Harvest Landing) is in the city of Perris, California, as shown on the United States Geological Survey (USGS) 7.5-minute Perris, California, quadrangle.

Geologic mapping of the region done by Dibblee and Minch (2003) indicates the project site is located atop Holocene age alluvial fan deposits (Qa) capped by a thin layer of grey soil. Holocene age sediments are not expected to be fossiliferous, though they may contain subfossils. Nearby surface exposures of older Pleistocene age alluvium (Qoa) occur nearby the project site, suggesting such older units may underlie the project area (Dibblee and Minch, 2003). Pleistocene age Quaternary alluvial deposits in northwestern Riverside County have yielded the remains of †*Mammut pacificus*, †*Mammuthus columbi*, †*Smilodon*, Camelidae, *Equus*, *Bison*, ground sloths, microfossils including lagomorphs and rodents, and plants (Jefferson 1991; Reynolds and Reynolds 1991; Springer and Scott 1994).

For this review, I conducted a search of the Regional Paleontological Locality Inventory (RPLI) at the SBCM. The results of this search indicate that no paleontological localities were found within the proposed project site, nor within a 1-mile radius from the project's perimeter.

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The nearest SBCM localities, 5.3.298 – 300, are situated 1.25 miles north-northeast of the project site within the Perris Valley Storm Drain. These localities consisted of *ex-situ* clayey and silty medium-grained sand washed and redeposited into the storm drain by a thunderstorm. The wash sediments were found to contain unaltered to lightly permineralized Rancholabrean age bones, including those of *Actinemys* cf. *pallida*, †*Mammut pacificus*, *Equus* sp., and *Bison* sp.

This records search covers only the paleontological records of the San Bernardino County Museum. It is not intended to be a thorough paleontological survey of the proposed project area covering other institutional records, a literature survey, or any potential on-site survey.

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

Sincerely,



Scott Kottkamp, Curator of Earth Science
Division of Earth Science
San Bernardino County Museum

Literature Cited

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