



9 June 2017

Mr. Bill Lo
Sunmeadows, LLC
27127 Calle Arroyo, Suite 1910
San Juan Capistrano, California 92675

Subject: Paleontological Resource and Mitigation Monitoring Assessment, Roquet Ranch subdivision project, city of Colton, San Bernardino County, California (TTM 19983; APNs 116-701-101, -102, 116-702-101, -105, -121, -122, -123, and 116-703-118)

Dear Mr. Lo:

Site Location: A Paleontological Resource and Mitigation Monitoring Assessment has been completed for the site of the proposed Roquet Ranch housing subdivision project (Tentative Tract Map [TTM] 19983; Assessor's Parcel Numbers [APNs] 116-701-101, -102, 116-702-101, -105, -121, -122, -123, and 116-703-118). The proposed project site encompasses most of the southern half of La Loma Hills, which are bounded on the west and north by the Santa Ana River floodplain, on the east by residential neighborhoods west of La Cadena Drive and the Interstate 215 freeway, and north and northeast of mainly undeveloped properties north of the San Bernardino-Riverside County line in the city of Colton, San Bernardino County, California (Attachments 1 through 3). Outliers away from the main project area include along South Riverside Avenue, along Center Street west of Orange Street, along the Riverside County Flood Control District (RCFCD) channel, and along La Cadena Drive (Attachment 3). On the U. S. Geological Survey 7.5-minute, 1:24,000-scale San Bernardino South, California topographic quadrangle map, the primary project site occupies unsectioned lands of the old Jurupa (Stearns) Spanish Land Grant in parts of projected Section 36, Township [T.] 1 South and Range [R.] 5 West, Section 6 in T. 1 S. and R. 4 W., Section 1 in T. 2 S. and R. 5 W., and Section 6 in T. 2 S. and R. 4 W., San Bernardino Base and Meridian. The subject property encompasses approximately 336.2 acres and exhibits considerable topographic relief.

Geology: Geologically, the project site encompasses much of the southern half of La Loma Hills and overlooks the Santa Ana River floodplain to the west. La Loma Hills are predominantly composed of Cretaceous granitic rocks (tonalites to granodiorites) of the Box Springs plutonic complex (Attachment 4, after D. M. Morton and F. K. Miller, 2003, Geologic map of the San Bernardino 30' x 60' quadrangle, California: U. S. Geological Survey, Open-File Report 03-293, sheet 1 [scale 1:100,000]). The granitic rocks range from a porphyritic granodiorite (map unit

Kbg), through a heterogeneous granodiorite and tonalite (map unit Kbg), to a biotite-hornblende tonalite (map unit Kbft) (Attachment 4). The few sedimentary units, mainly exposed around the perimeter of the project site, include Quaternary (early to late Pleistocene) older alluvial valley deposits (map unit Qoa₃), and old and very old alluvial fan deposits (map units Qof₃ and Qvof₃) that consist of well consolidated, crudely stratified, texturally massive to faintly laminated, poorly sorted, fine- to very coarse-grained sand capped by A/AB/B soils having a Bt horizon as much as 1 to 2 meters thick (Morton and Miller, 2003, p. 125). The middle Pleistocene older alluvial fan sediments (Qof₃) in the northwest valley probably represent coarser clastic materials derived from upslope exposures on the steep hillside slopes, whereas those across much of the southern part of the site and to the east probably represent more distal, finer-grained fan sediments derived from the Box Mountains to the east of the site. These older fan sediments grade eastward into even older, early to middle Pleistocene, alluvial fan sediments (Qvof₃) derived from the Box Springs plutonic complex. Along the course of the Santa Ana River and its associated floodplain, all of the mapped sedimentary units adjacent to the project site are middle or late Holocene (“modern”) in age (late Holocene map units are Qw, Qw₁, Qw₂, and Qw₃ [Quaternary wash deposits], and Qa [Quaternary alluvial valley deposits] and Qyf₅ [Quaternary young alluvial fan deposits]). Middle Holocene map units include Quaternary young alluvial valley deposits (map unit Qya₃).

Paleontological Sensitivity: The degree of paleontological sensitivity of any particular area is based on a number of factors, including the geologic age of the sediments, the documented presence of fossiliferous resources on a site or in nearby areas, the presence of documented fossils within a particular geologic formation or lithostratigraphic unit, and whether or not the original depositional environment of the sediments is one that might have been conducive to the accumulation of organic remains that might have become fossilized over time. Late Quaternary (late Holocene, or “modern”) alluvial valley and alluvial fan deposits are generally considered to be too young geologically to contain significant nonrenewable paleontological resources (*i.e.*, fossils) and are thus typically assigned a low paleontological sensitivity. Older, Pleistocene (> 10,000 year old), alluvial valley and alluvial fan deposits in the Inland Empire, however, often yield important Ice Age terrestrial vertebrate fossils, such as mammoths, mastodons, giant ground sloths, extinct species of horse, bison, and camel, saber-toothed cats, and others (E. G. Scott, 2013, attached). These Pleistocene sediments are thus accorded a high paleontological resource sensitivity. The Holocene alluvial and wash deposits of the Santa Ana River floodplain west of the project area are too young to contain significant paleontological resources and are typically accorded a low paleontological sensitivity.

A paleontological sensitivity map generated by the Riverside County Land Information System for a nearby project just south of the Riverside County line ranks the same Quaternary (Pleistocene) sedimentary units as present on the margins of the Roquet Ranch project site (*i.e.*, Qof₃ and Qvof₃) as having a High Potential/Sensitivity (High A) for paleontological resources, a ranking that is “based on [the presence of] geologic formations or mappable rock units that contain fossilized body elements, and trace fossils such as tracks, nests and eggs. These fossils occur on or below the surface.”

Records Search: A paleontological literature review and collections and records search conducted for a nearby property (Bixby Highgrove housing subdivision) by the Curator of Paleontology in the Division of Geological Sciences at the San Bernardino County Museum in Redlands (E. G. Scott, 2013) is attached. The records search did not identify any previously recorded fossil

localities within the project boundaries, nor within a one-mile radius of the project site, which would encompass the southern part of the current project site. However, on the basis of the numerous known vertebrate fossil localities from Quaternary (Pleistocene) alluvial and alluvial fan deposits across the Inland Empire, the San Bernardino County Museum regards the alluvial fan deposits as having a high potential to contain significant paleontological resources, and thus recommended that a program be implemented to “mitigate impacts to [these] nonrenewable paleontological resources.” A copy of the collections and records search report is attached (E. G. Scott, 2013).

Paleontological Survey: Foot surveys of the Roquet Ranch property and off-site improvement areas were conducted by staff of Brian F. Smith and Associates, Inc. on March 7, 2014, May 6, 2015, and July 5 to 8, 2016. No fossils or fossiliferous sediments were observed in any of the Quaternary sedimentary exposures in the northwest valley area, nor in the southwestern, southern, or southeastern parts of the subject property. Areas of granitic outcrops were excluded from the survey, given that fossils are never present in igneous (granitic) rocks.

Recommendations: The existence of Quaternary older alluvial valley and alluvial fan sediments around the project site (Qoa₃, Qof₃, and Qvof₃ on Attachment 4), the known abundance of terrestrial vertebrate fossils from these types of sediments in the Inland Empire of Riverside County and San Bernardino County, and the High Potential/Sensitivity (High A) assigned to these Quaternary sediments for yielding paleontological resources (Scott, 2013, attached) all support the recommendation that full-time paleontological monitoring be required during all mass grading and excavation activities where these geologic units are mapped within the Roquet Ranch project area in order to mitigate any adverse impacts (loss or destruction) to potential nonrenewable paleontological resources. A Paleontological Mitigation Monitoring and Reporting Program (MMRP) consistent with the provisions of the California Environmental Quality Act (CEQA), those of the City of Colton and the County of San Bernardino, and those of the draft guidelines of the Society of Vertebrate Paleontology should be implemented for any mass grading and excavation-related activities, including utility trenching, during construction within the Area of Potential Effect (APE) in the project area. Areas mapped as exposing granitic rocks need not be monitored for paleontological resources.

If you have any questions concerning this evaluation, please feel free to contact us at our Poway address. Thank you for the opportunity to have provided paleontological services for this project.

Sincerely,

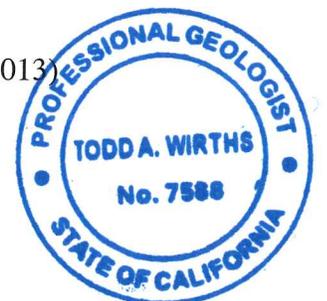


George L. Kennedy, Ph.D.
Senior Paleontologist



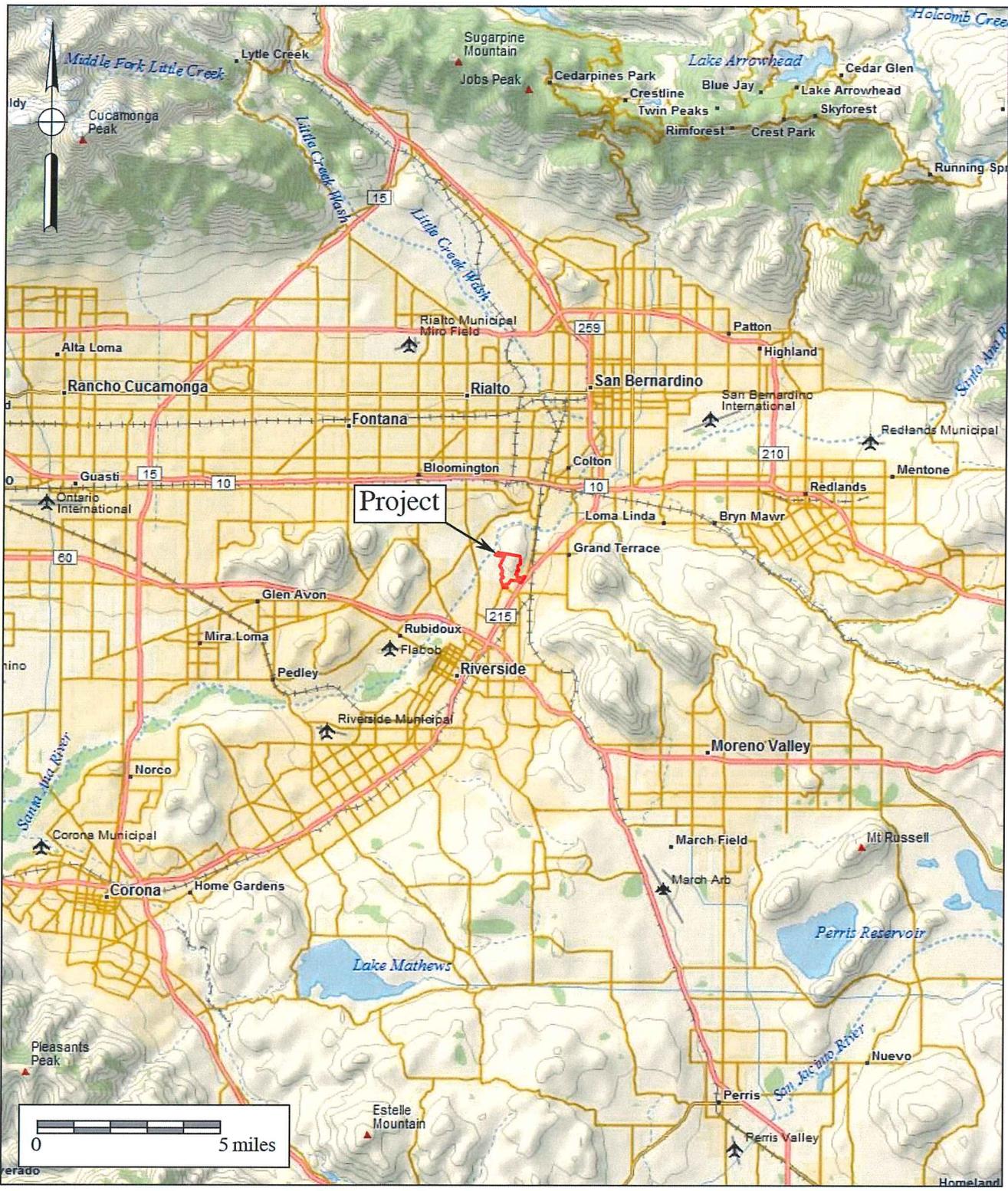
Todd A. Wirths, M.S.
California Professional Geologist No. 7588

Attachments: Index maps, geologic map, SBCM records search report (Scott, 2013)



References:

- Morton, D. M., and Miller, F. K. 2003. Geologic map of the San Bernardino 30' X 60' quadrangle, California (Version 1.0). U. S. Geological Survey Open-File Report 03-293: sheets 1-5 (scale 1:100,000) and pamphlet, pages 1-189.
- Scott, E. G. 2013. Paleontology records review, Bixby Highgrove Project, Riverside County, California. Unpublished paleontological report prepared for Brian F. Smith and Associates, Inc., Poway, California, by the Division of Geological Sciences, San Bernardino County Museum, Redlands, California.



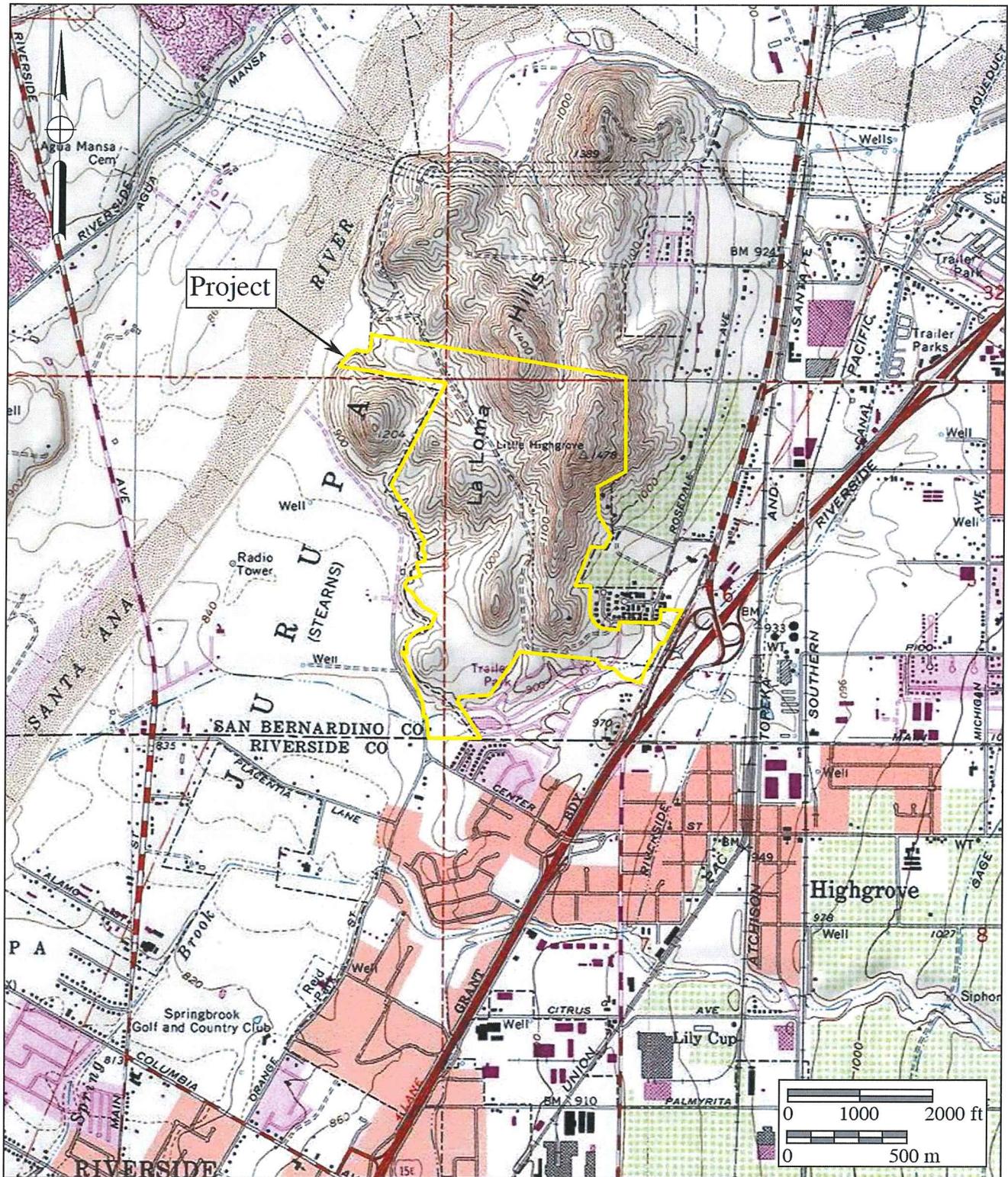
Attachment 1

General Location Map

The Roquet Ranch Project

DeLorme World Base Map Service (1:250,000 series)





Project

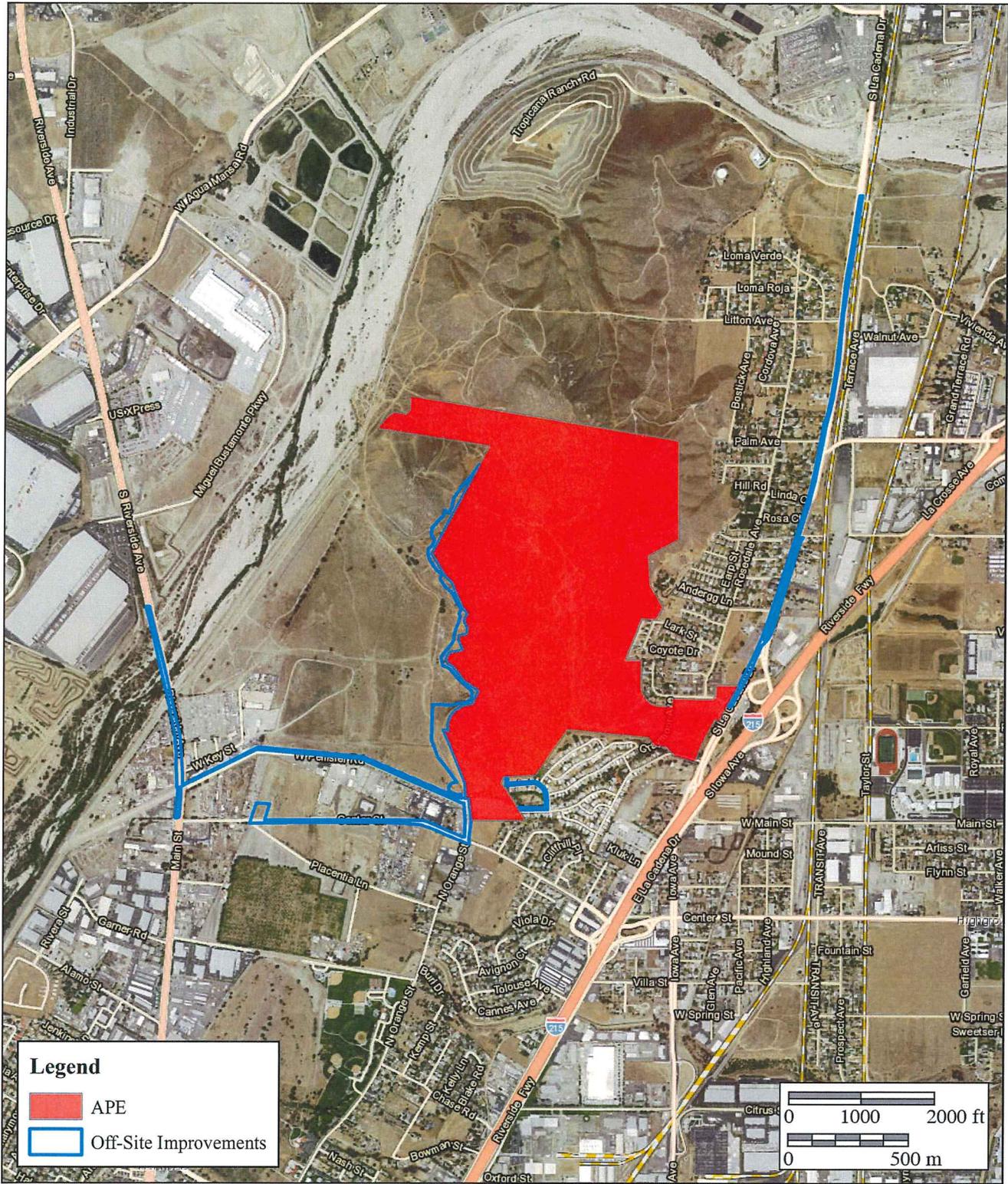
Attachment 2

Project Location Map

The Roquet Ranch Project

USGS San Bernardino South Quadrangle (7.5-minute series)

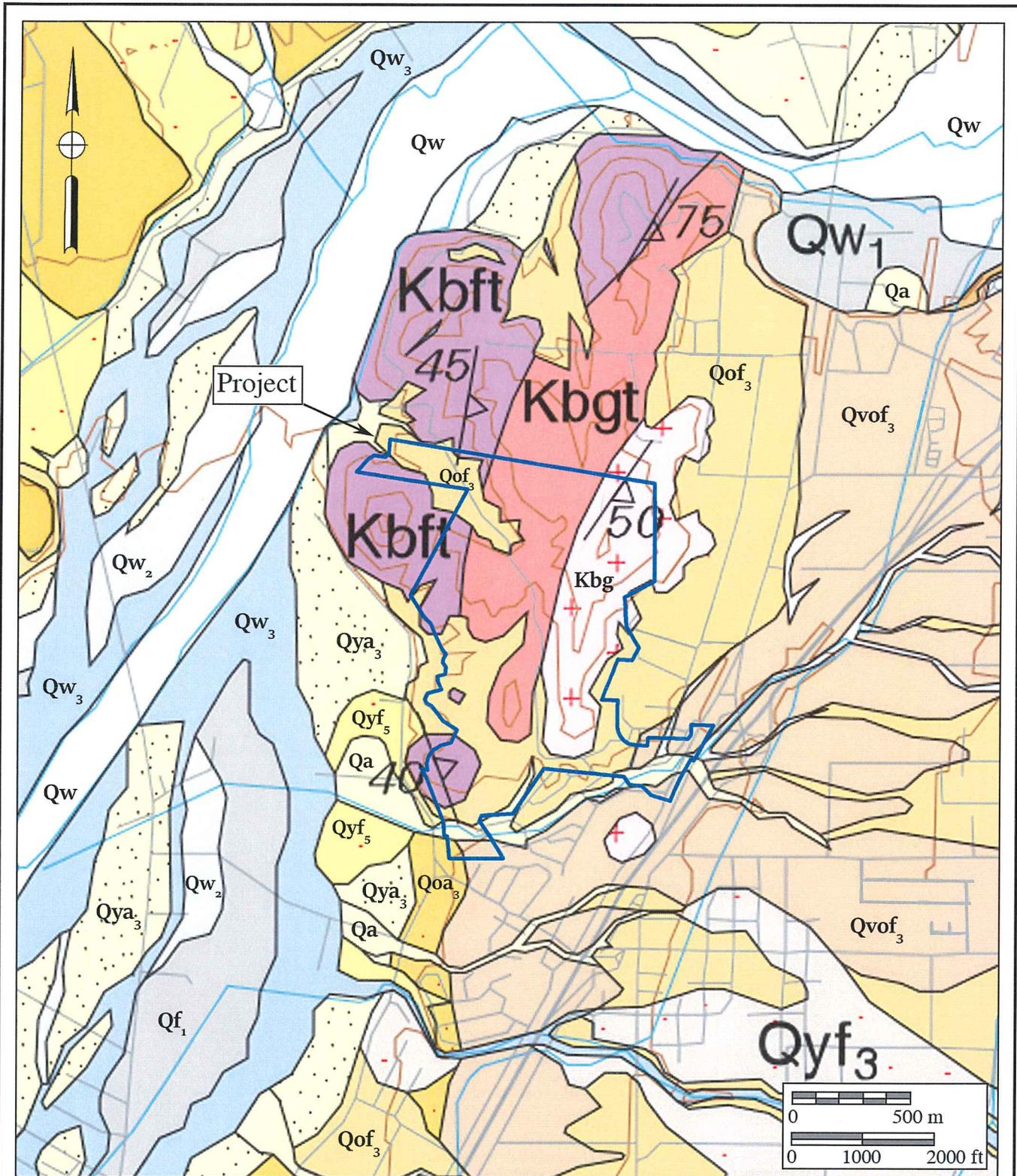




Attachment 3

Off-Site Improvements Map

The Roquet Ranch Project



Attachment 4

Geologic Map

The Roquet Ranch Project

USGS 30' x 60' San Bernardino Quadrangle





SAN BERNARDINO COUNTY MUSEUM

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COUNTY OF SAN BERNARDINO
PUBLIC AND SUPPORT
SERVICES GROUP

ROBERT L. MCKERNAN
Director

27 November 2013

Brian F. Smith and Associates
attn: George L. Kennedy, Ph.D., Senior Paleontologist
14010 Poway Road, Suite A
Poway, CA 92064

re: **PALEONTOLOGY RECORDS REVIEW, BIXBY HIGHGROVE PROJECT,
RIVERSIDE COUNTY, CALIFORNIA**

Dear Dr. Kennedy,

The Division of Geological Sciences of the San Bernardino County Museum (SBCM) has completed a literature review and records search for the above-named project in the Highgrove region of Riverside County, California. The proposed project property is located in the western portion of section 8, Township 2 South, Range 4 West, San Bernardino Base and Meridian, as seen on the San Bernardino South, California 7.5' United States Geological Survey topographic quadrangle map (1967 edition, photorevised 1980).

Geologic mapping (Bortugno and Spittler, 1986; Morton and Miller, 2003) indicates that the proposed property is situated upon surficial exposures of Quaternary fan deposits laid down during the early, middle, and later Pleistocene Epoch (= units **Qvof₃** and **Qof₃**), overlain to the south by a thin sedimentary veneer of Holocene fan deposits (= **Qyf₃**). The Holocene sediments are too young geologically to contain significant fossil resources, and so are assigned low paleontologic sensitivity. In contrast, the surface and subsurface Pleistocene sediments have high potential to yield significant nonrenewable paleontologic resources, and so are assigned high paleontologic sensitivity. Pleistocene older alluvium (including Pleistocene alluvial fan deposits) throughout San Bernardino and Riverside Counties and the Inland Empire have been repeatedly demonstrated to have high paleontologic sensitivity (Jefferson, 1991; Reynolds and Reynolds, 1991; Anderson and others, 2002; Springer and others, 2009, 2010; Scott, 2010). Fossils recovered from these Pleistocene sediments represent extinct taxa including mammoths, mastodons, ground sloths, dire wolves, short-faced bears, sabre-toothed cats, large and small horses, large and small camels, and bison (Jefferson, 1991; Reynolds and Reynolds, 1991; Springer and others, 2009, 2010; Scott, 2010).

For this review, I conducted a search of the Regional Paleontologic Locality Inventory (RPLI) at the SBCM. The results of this search indicate that no previously - known paleontologic resource localities are recorded by the SBCM within the boundaries of the proposed property, nor from within at least one mile in any direction.

Recommendations

The results of the literature review and the search of the RPLI at the SBCM demonstrate that the proposed study area is located on surface and subsurface sediments with high potential to contain significant paleontologic resources. A qualified vertebrate paleontologist must develop a program to mitigate impacts to nonrenewable paleontologic resources. This mitigation program must be consistent with the provisions of the California Environmental Quality Act (see Scott and Springer, 2003), as well as with regulations implemented by the County of Riverside. This program should include, but not be limited to:

1. Monitoring of excavation into rock units having high potential to contain significant nonrenewable paleontologic resources. Based upon the results of this review, such units present within the boundaries of the proposed project property include older Pleistocene fan deposits. Paleontologic monitors must be equipped to salvage fossils as they are unearthed, to avoid construction delays, and to remove samples of sediments that are likely to contain the remains of small fossil invertebrates and vertebrates. Monitors must be empowered to temporarily halt or divert equipment to allow removal of abundant or large specimens.
2. Preparation of all recovered specimens to a point of identification and permanent preservation, including washing of sediments to recover small invertebrates and vertebrates. Preparation and stabilization of all recovered fossils are essential in order to fully mitigate adverse impacts to the resources (Scott and others, 2004).
3. Identification and curation of specimens into an established, accredited museum repository with permanent retrievable paleontologic storage. These procedures are also essential steps in effective paleontologic mitigation (Scott and others, 2004) and CEQA compliance (Scott and Springer, 2003). The paleontologist must have a written repository agreement in hand prior to the initiation of mitigation activities. Mitigation of adverse impacts to significant paleontologic resources is not considered complete until such curation into an established museum repository has been fully completed and documented. .
4. Preparation of a report of findings with an appended itemized inventory of specimens. The report and inventory, when submitted to the appropriate Lead Agency along with confirmation of the curation of recovered specimens into an established, accredited museum repository, would signify completion of the program to mitigate impacts to paleontologic resources.

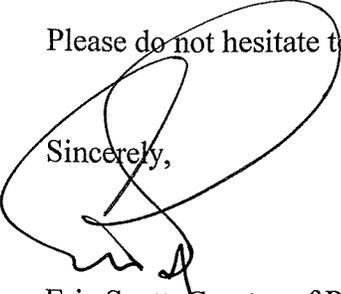
References

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- Bortugno, E.J. and T. E. Spittler, 1986. Geologic map of California, San Bernardino sheet, scale 1:250,000. California Division of Mines and Geology Regional Geologic Map Series, Map 3A.
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- Morton, D.M. and F.K. Miller, 2003. Preliminary digital geologic map of the San Bernardino 30' x 60' quadrangle, California, version 1.0. United States Geological Survey Open-File Report 03-293. Digital preparation by P.M. Cossette and K.R. Bovard. 189 p.
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- Scott, E., 2010. Extinctions, scenarios, and assumptions: changes in latest Pleistocene large herbivore abundance and distribution in western North America. *In* E. Scott and G. McDonald (eds.), *Faunal dynamics and extinction in the Quaternary: Papers honoring Ernest L. Lundelius, Jr.* *Quaternary International* 217: 225-239.
- Scott, E. and K. Springer, 2003. CEQA and fossil preservation in southern California. *The Environmental Monitor*, Fall 2003, p. 4-10, 17.
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Please do not hesitate to contact us with any further questions you may have.

Sincerely,



Eric Scott, Curator of Paleontology
Division of Geological Sciences
San Bernardino County Museum