



29 January 2019

Ms. Connie Anderson
T&B Planning, Inc.
17542 East 17th Street, Suite 100
Tustin, California 92780

Subject: Paleontological Resource Impact Mitigation Program (PRIMP) for the Seaton Commerce Center project, west of Perris in unincorporated Riverside County, California (PPT180025, CEQ180101; GEO180039)

Dear Ms. Anderson:

Introduction and Site Location: This report constitutes the Paleontological Resource Impact Mitigation Program (PRIMP) for the Seaton Commerce Center project (PPT180025, CEQ180101; GEO180039), west of Perris and the I-215 corridor in unincorporated Riverside County, California (Attachments 1 and 2). In a letter dated 4 January 2019, the Planning Department of Riverside County granted approval of the drafting of this PRIMP for the project, based on the recommendation stated in Brian F. Smith and Associates, Inc. (BFSA)'s "Paleontological Resource and Mitigation Monitoring Assessment, Seaton Commerce Center Project" for the project site, dated 6 December 2018 (Kennedy and Wirths 2018). The approximately 10-acre property is located on the southeast corner of Perry Street and Seaton Avenue. The site is currently vacant, as are the properties to the immediate north and east. To the west is a mix of rural residential properties, and to the south, commercial or light industrial operations. On the U. S. Geological Survey 7.5-minute Steele Peak, California topographic quadrangle map, the site is located in the southwest quarter of the southwest quarter of Section 1, Township 4 South, Range 4 West, San Bernardino Base and Meridian (Attachment 2).

Geology: The geology of the project site and immediate area is shown on Attachment 3 (after D. M. Morton, 2001, Geologic map of the Steele Peak 7.5' quadrangle, Riverside County, California: U. S. Geological Survey Open-File Report 01-449, scale 1:24,000, and on the adjacent Perris 7.5' quadrangle [D. M. Morton, 2003]). The map of the area shows that the project is underlain by lower Pleistocene (approximately 1.8 million to perhaps 200,000 to 300,000 year old) very old alluvial fan deposits (Qvofa, shown in light brown on Attachment 3) that lap onto granitic exposures of the Cretaceous Val Verde Tonalite (Kvt on Attachment 3) along the west side of the project. Geomorphically, there is a very gentle slope to the east toward Perris Valley.

Paleontological Sensitivity: A paleontological sensitivity map generated by the Riverside County Land Information System in November 2018 (Attachment 4) ranks most of the project area as having a High Potential/Sensitivity (High B), which 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.” The category “High B” indicates that fossils are likely to be encountered at or below a depth of four feet, and may be impacted by excavation work during construction-related activities. Very old alluvial fan sediments with a High Potential/Sensitivity (High B) to yield nonrenewable paleontological resources (*i.e.*, fossils) are shown in amber tint on Attachment 4. The western part of the project, which is composed of Cretaceous granitic rocks, is ranked as having a Low Paleontological Potential/Sensitivity. Fossils are never found in granitic rocks, which are formed by cooling magma miles below the Earth’s surface, and thus do not have any paleontological resource potential or sensitivity.

Records Searches: A paleontological literature review and collections and records search report of a nearby area (Stratford Ranch), approximately 1.5 miles to the east of the Seaton Commerce Center project site (on the east side of Perris Boulevard and the north side of Ramona Expressway), was previously prepared by the Geological Sciences Division of the San Bernardino County Museum (SBCM) in Redlands, California (E. G. Scott, 2005, attached) and is used in this evaluation. The report did not record any previously located fossil localities within the project area, nor within a one-mile radius in any direction. The records search report regarded the older Pleistocene alluvial fan deposits (Qvof_a on Attachment 3) as having a high potential to contain significant nonrenewable paleontological resources (*i.e.*, fossils), and the project area was assigned a “high paleontological resource sensitivity” (Scott, 2005). Similar older Pleistocene sediments throughout the lowland (valley) areas of Riverside County and the Inland Empire have been reported to yield significant fossils of extinct terrestrial mammals from the last Ice Age (see references in Scott, 2005 [attached], and Jefferson, 1991), such as mammoths, mastodons, giant ground sloths, dire wolves, short-faced bears, saber-toothed cats, large and small horses, camels, and bison. The closest recorded terrestrial vertebrate fossil localities are located about six miles to the east, southwest of Lakeview Hot Springs on the southeast side of the Perris Reservoir (E. G. Scott, 2013, attached; SBCM localities 5.3.151 and 5.3.153). Fossil vertebrates collected from these localities included mammoths, extinct horses, and extinct bison. In another report, Reynolds (2004) reported fossil *Bison* from a location approximately seven to eight miles northeast of the current project from a depth of 17 feet below the ground surface, suggesting that they were from Pleistocene older alluvial or older alluvial fan sediments.

Paleontological Survey: Based on Google Earth imagery (accessed in January 2019), all of the areas of Quaternary sediments have been recently graded or tilled and it is unlikely that any paleontological resources would still be present at the surface in these areas. The areas with exposures of granitic and metamorphic rocks would not have any fossils. For this reason, a foot survey of the property was not conducted. However, it is unlikely that a survey would have yielded information on subsurface paleontological resources at the site, even if they were present below the surface.

Recommendations: Because of the High Paleontological Sensitivity (High B) assigned to the older alluvial fan deposits (Qvof_a on Attachment 3) across much of the project site, a PRIMP detailing full-time paleontological monitoring of mass grading and excavation (utility trenching, etc.) activities in areas mapped as Quaternary older alluvial fan deposits was recommended in a letter report by BFSA dated 6 December 2018 in order to mitigate any adverse impacts (loss or destruction) to potential nonrenewable paleontological resources (*i.e.*, fossils). Paleontological monitoring was not required where the Cretaceous granitic rocks are exposed at the surface or in the shallow subsurface (less than four feet below ground level) on the west side of the project. The drafting of this PRIMP was approved by the Riverside Planning Department in a letter dated 4 January 2019.

The recommendations in this PRIMP's Mitigation Monitoring and Reporting Program (MMRP) are consistent with the intent and provisions of the California Environmental Quality Act (CEQA), environmental guidelines of the County of Riverside, and the draft guidelines of the Society of Vertebrate Paleontology (2010) and should be implemented for any mass grading and excavation-related activities (including utility and storm drain trenching) in the older Quaternary sediments, during construction within the project area. However, paleontological monitoring may be reduced if, based on the observations and recommendations of the professional-level project paleontologist in consultation with the County of Riverside, the excavations are only occurring in coarser-grained or other sediments that are unlikely to yield paleontological resources. Paleontological monitoring is not needed in areas mapped as being underlain by granitic rocks as shown on Attachment 3. Further points of clarification regarding the paleontological mitigation program include:

- *Identifications and qualifications of the qualified paleontological monitor to be employed for grading operations monitoring:* The primary paleontological monitor will be Todd A. Wirths, a California Professional Geologist (P.G. No. 7588), who has numerous years of experience doing geological investigations, paleontological monitoring, and salvage recovery in southern and central California. In addition, other qualified BFSA staff under the direction and supervision of Mr. Wirths will conduct monitoring, and may include Clarence Hoff, Richard Savitch, Anne Maloney, Mary Garrett, James Shrieve, and Charles Callahan. All of these personnel have training to observe, identify, and collect fossils and have at least several years of experience conducting paleontological monitoring in Riverside County.
- *Identification of personnel with authority and responsibility to temporarily halt or divert grading equipment to allow for the recovery of large specimens:* In the field, the primary monitor (Todd A. Wirths, P.G.), as well as monitors under the direction and supervision of Mr. Wirths listed above, will be the responsible persons on-site with the assigned authority and responsibility to control all grading operations that might adversely affect any salvage efforts. In our office, the primary person will be Todd A. Wirths, P.G., the principal investigator for paleontology for this project and a listed qualified paleontologist with the County of Riverside.
- The primary monitor shall participate in a pre-construction meeting attended by County development staff, the onsite project supervisor, and construction and grading foremen to explain the nature of fossils that might be found during paleontological monitoring and the steps that will be needed to salvage them. Electronic copies of all grading and excavation plans must be made

available to the paleontological monitor prior to initiation of any grading or excavation work.

- *Direction for any fossil discoveries to be immediately reported to the property owner who in turn will immediately notify the County of Riverside of the discovery:* All paleontological monitors automatically inform the company office (Todd A. Wirths) upon discoveries of fossils while monitoring. It is the practice of our office to immediately notify all concerned parties (client, resident engineer, and lead agency [*i.e.*, the Planning Department of the County of Riverside]) at the time of any discovery.

- *Means and methods to be employed by the paleontological monitor to quickly salvage fossils as they are unearthed to avoid construction delays:* Paleontological salvage on trenching activities is typically from the trench spoils and does not delay the trenching activity. Fossils are collected and placed in cardboard flats or plastic buckets and identified by field number, collector, and date collected. Notes are taken on the map location and stratigraphy of the site, and the site is photographed before it is vacated and the fossils removed to a safe place. On mass grading projects, any discovered fossil site is protected by red flagging to prevent it from being overrun by earthmovers (scrapers) before salvage begins. All grading activities within 50 feet of the discovery site should be suspended until fossil recovery has been completed. Fossils are collected in a similar manner, with notes and photographs being taken before removing fossils. If the site involves a large terrestrial vertebrate, for example, large bone(s) or a mammoth tusk, that is/are too large to be easily removed by a single monitor, a field crew will be sent to the site to excavate around the find, encase the discovery within a plaster jacket, and remove it after the plaster has set. For large fossils, use of the contractor's construction equipment is solicited to remove the jacket to a safe location before it is returned to our laboratory facility.

It is the primary responsibility of the paleontological monitor to recover any fossils revealed during the construction process. However, it is the responsibility of the professional-level paleontologist, and not the paleontological monitor, to determine the significance of any recovered fossils, and whether or not they should be collected and/or archived in an accredited institution that maintains collections of paleontological materials.

- *Sampling of sediments that are likely to contain the remains of small fossil invertebrates and vertebrates:* Sediments containing small invertebrate and/or vertebrate fossils are considered just as important as larger fossils and will always be collected (see below). When vertebrate fossil remains are recovered, additional sediment samples will be taken from the same location to process for microvertebrate specimens.

- *Procedures and protocol for collecting and processing samples and specimens:* Isolated fossils are collected by hand, wrapped in protective paper, and placed in temporary collecting flats or five-gallon buckets. Notes are taken on the map location and stratigraphy of the site, and the site is photographed before it is vacated and the fossils removed to a safe place. Particularly small invertebrate fossils typically represent multiple specimens of a limited number of organisms, and a scientifically suitable sample can be obtained by one to several five-gallon buckets of fossiliferous sediment. If it is possible to dry-screen the sediment in the field, a concentrated sample may consist of one or two buckets of material. For microvertebrate fossils, the standard test is usually the observed presence of small pieces of bone within the sediments.

If bone is present, as many as 20 to 40 five-gallon buckets of sediment can be collected and returned to a separate facility to wet screen the sediment. If, after five buckets have been wet-screened and have failed to yield any microvertebrate or other fossil material under microscopic examination, then this process can be terminated. In the laboratory, any recovered fossils are cleaned of extraneous matrix, any breaks are repaired, and the specimen, if necessary, is stabilized by soaking in an archivally approved acrylic hardener (e.g., a solution of acetone and Paraloid B-72).

It sometimes happens that fossils are found and collected by construction workers when a paleontological monitor is not on site, or is occupied elsewhere on a grading project. In such cases, all work should be halted within 50 feet of the discovery location until it can be properly evaluated by the paleontological monitor or professional paleontologist.

- *Fossil identification and curation procedures to be employed:* Invertebrate fossils are to be identified by Dr. George L. Kennedy, who has more than 50 years of professional experience with the local fossil record of southern California. Vertebrate fossils will be identified by an adjunct vertebrate paleontology specialist, depending on the group of fossils needing identification (e.g., reptiles, birds, mammals, or fish). Standard museum curation steps will be utilized by, or under the direct supervision of, the principal investigator. Curation steps include cleaning, preparing, sorting, identifying, painting, numbering, and labeling of all specimens before submittal to the receiving institution.

- *Identification of the permanent repository to receive any recovered fossil material:* Pursuant to the County of Riverside “SABER Policy,” paleontological materials (fossils) found in Riverside County should, by preference, be directed to the Western Science Center Museum on Searl Road in Hemet, Riverside County, California. The County of Riverside may, however, select an alternative archival institution to receive any recovered fossils. A written agreement between the project developer and the preferred archival institution should be in hand before grading begins. The project owner/developer will assume financial responsibility for any institutional curation fees for the project.

- *Procedures for reporting of findings:* A final written report will be produced by the BFSA office and authored by the principal investigator, California Professional Geologist (Todd A. Wirths, P.G. 7588, a listed Riverside County Paleontology Consultant) and submitted to the Riverside County Planning Department at the conclusion of grading activities for the project. The report will include sections on general background information, previous studies (both geologic and paleontologic), results of findings and analysis, discussion of all recovered fossils, and a fossil list identified to the lowest taxonomic level possible, as well as a list of references cited and index and locality maps and graphics to show the locations of all fossil localities, etc. A letter documenting receipt and acceptance of the fossil collections by the receiving institution must be included in the final report, a copy of which is to be archived with the fossil collection. If fossils are not recovered during the project, the final report will be in a shortened letter format.

- *Identification and acknowledgement of the developer for the content of the PRIMP, as well as acceptance of financial responsibility for monitoring, reporting, and curation fees:* Brian F. Smith, President of BFSA, acknowledges that the project owner/developer will assume financial

responsibility for the PRIMP and any associated curation fees for the project.

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,

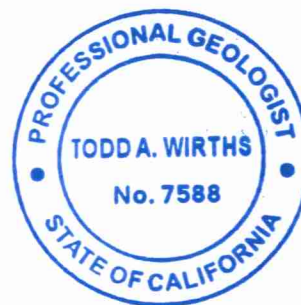


Carrie M. Kubacki, M.S.
Geologist



Todd A. Wirths, M.S., P.G. 7588
Senior Paleontologist, Calif. Prof. Geologist

Attachments: Index maps, geologic map, paleontological sensitivity map, records search reports



**Paleontological Mitigation Monitoring and Reporting Program (MMRP)
Seaton Commerce Center Project
(PPT180025, CEQ180101; GEO180039)**

1. Monitoring of mass grading and excavation activities in areas identified as likely to contain paleontological resources by a qualified paleontologist or paleontological monitor. Full-time monitoring will be conducted in areas of grading or excavation in undisturbed, very old alluvial fan sediments (Qvof_a on Attachment 3). Paleontological monitors will 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. The monitor must be empowered to temporarily halt or divert equipment to allow for the removal of abundant or large specimens in a timely manner. Monitoring of Cretaceous granitic rocks (Kvt on Attachment 3) at the surface or in the shallow subsurface (four-foot depth) along the west side of the project area is not necessary. Monitoring may be reduced if the potentially fossiliferous units are not present in the subsurface, or if present, are determined upon exposure and examination by qualified paleontological personnel to have a low potential to contain or yield fossil resources.

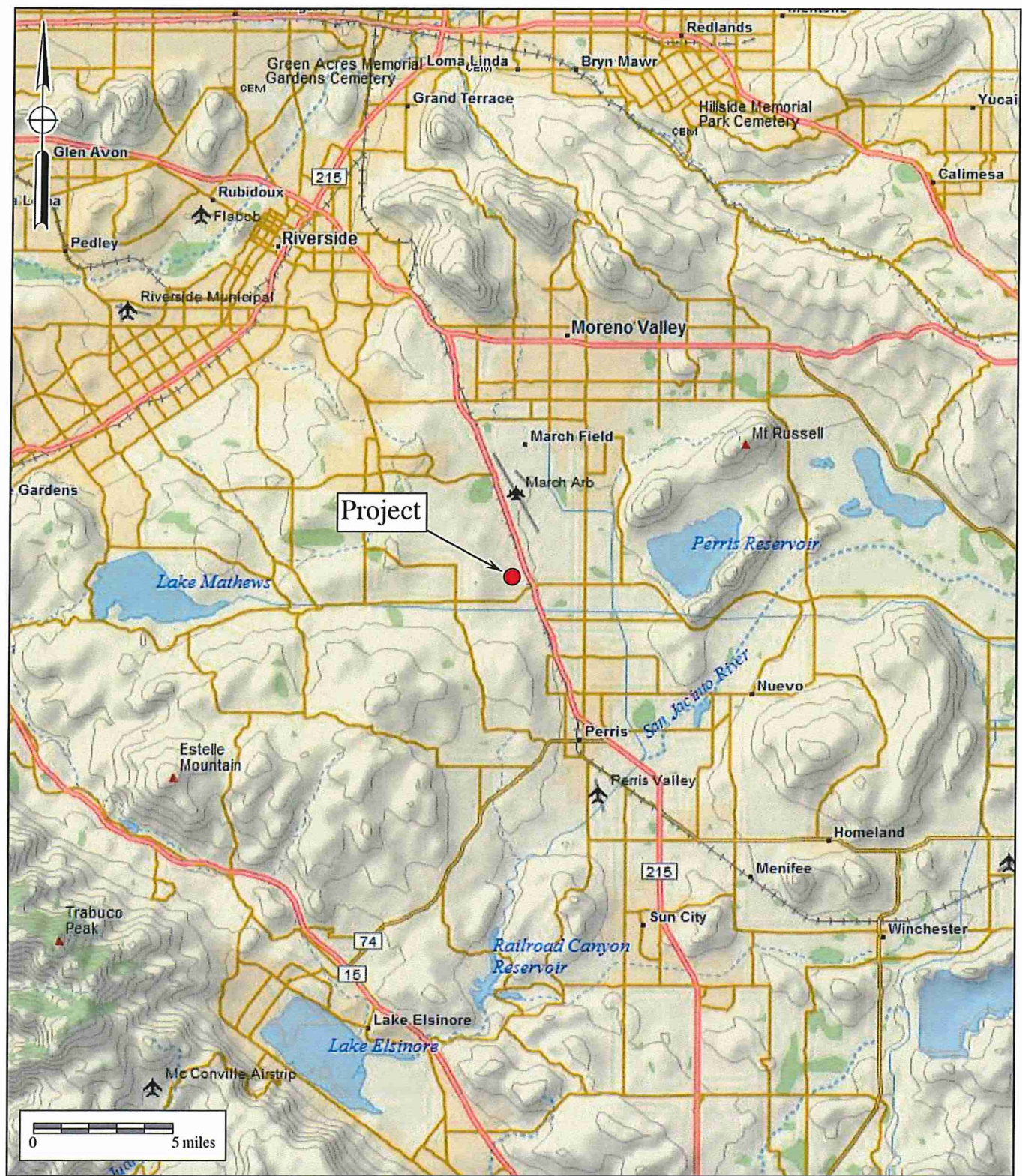
2. Preparation of recovered specimens to a point of identification and permanent preservation, including screen washing sediments to recover small invertebrates and vertebrates, if necessary. Preparation of individual vertebrate fossils is often more time-consuming than for accumulations of invertebrate fossils.

3. Identification and curation of specimens into a professional, accredited public museum repository with a commitment to archival conservation and permanent retrievable storage. Pursuant to the County of Riverside's "SABER Policy" (Safeguard Artifacts Being Excavated in Riverside County) for recovered fossils, they should, by preference be directed to (deposited at) the Western Science Center Museum, 2345 Searl Parkway, Hemet, California 92543. The paleontological program should include a written repository agreement prior to the initiation of mitigation activities.

4. Preparation of a final monitoring and mitigation report of findings and significance, including lists of all fossils recovered and necessary maps and graphics to accurately record their original location. The report, when submitted to the appropriate lead agency (County of Riverside), will signify satisfactory completion of the project program to mitigate impacts to any paleontological resources.

References:

- Jefferson, G. T. 1991. A catalogue of late Quaternary vertebrates from California: Part two, mammals. Natural History Museum of Los Angeles County, Technical Reports, no. 7: i-v + 1-129.
- Kennedy, G. L. and T.A. Wirths. Paleontological resource and mitigation monitoring assessment, Seaton Commerce Center project, west of Perris in unincorporated Riverside County, California (PPT180025; CEQ180101; GEO180039). Unpublished report on file at the County of Riverside Planning Department, Riverside, California.
- Morton, D. M. 2001. Geologic map of the Steele Peak 7.5' quadrangle, Riverside County, California: U. S. Geological Survey, Open-File Report 01-449: 1 map sheet with text, scale 1:24,000.
- Morton, D. M. 2003. Preliminary geologic map of the Perris 7.5' quadrangle, Riverside County, California: U. S. Geological Survey, Open-File Report 03-270: 1 map sheet with text, scale 1:24,000.
- Reynolds, R. E. 2004. Paleontological resource investigation, Moreno Highlands fault investigation. *In* unpublished geologic report prepared by Leighton & Associates, 2004, Preliminary fault investigation, Tentative Tract Map No. 32501, Moreno Highlands, City of Moreno Valley, Project No. 111061-1031.
- Scott, E. G. 2005. Paleontology literature and records review, Stratford Ranch project (BFSA # 04-175), Perris region, Riverside County, California. Unpublished report prepared for Brian F. Smith and Associates, Poway, by the Division of Geological Sciences, San Bernardino County Museum, Redlands.
- Scott, E. G. 2013. Paleontology literature and records review, Ecos Nuevo project, Lakeview Hot Springs region, Riverside County, California. Unpublished report prepared for Brian F. Smith and Associates, Inc., Poway, by the Division of Geological Sciences, San Bernardino County Museum, Redlands.
- Society of Vertebrate Paleontology. 2010. Standard Procedures for the Assessment and Mitigation of Adverse Impacts to Paleontological Resources; Impact Mitigation Guidelines Revision Committee. http://vertpaleo.org/Membership/Member-Ethics/SVP_Impact_Mitigation_Guidelines.aspx, accessed January 10, 2019.

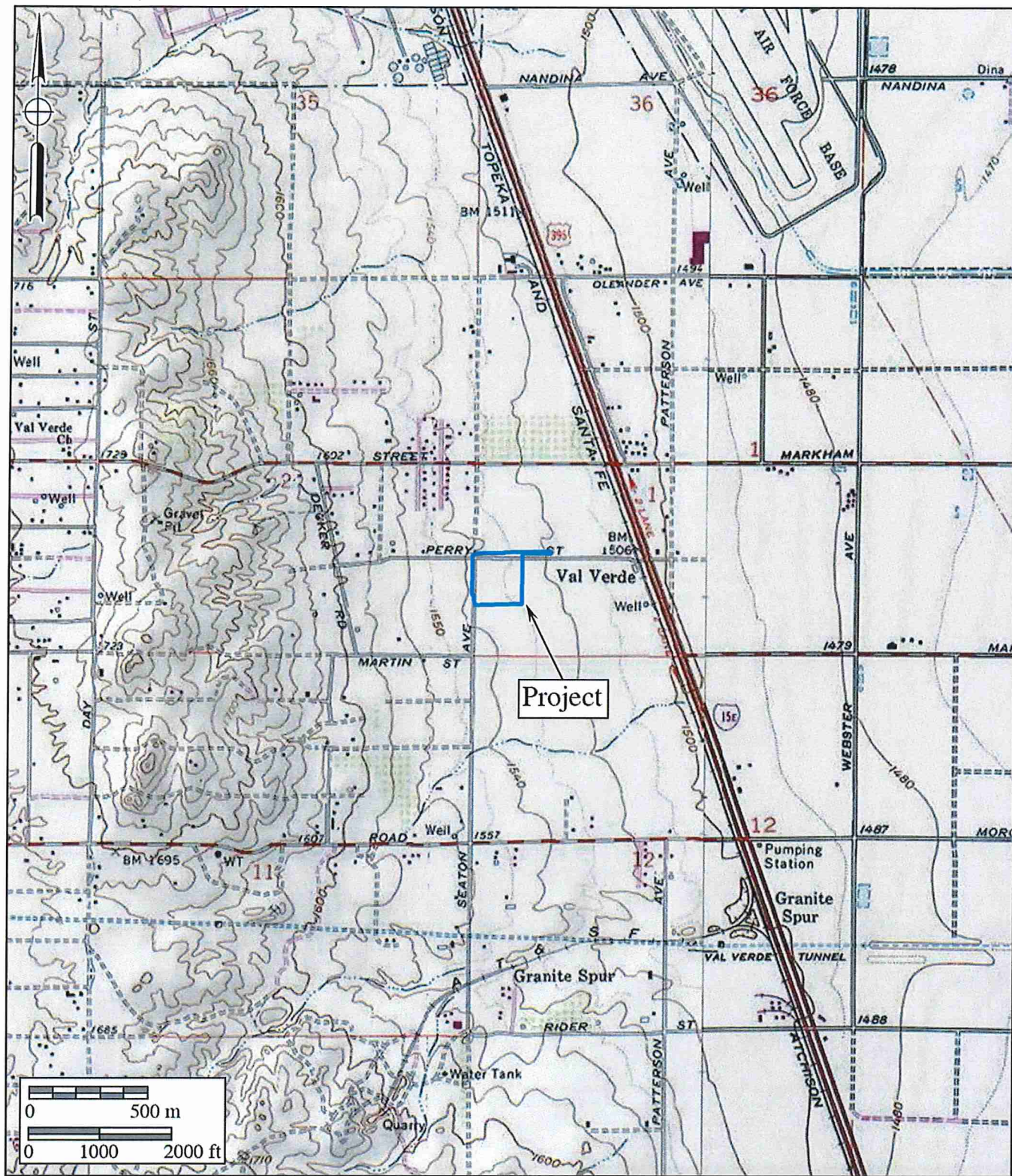


Attachment 1 **General Location Map**

The Seaton Commerce Center Project

DeLorme (1:250,000)





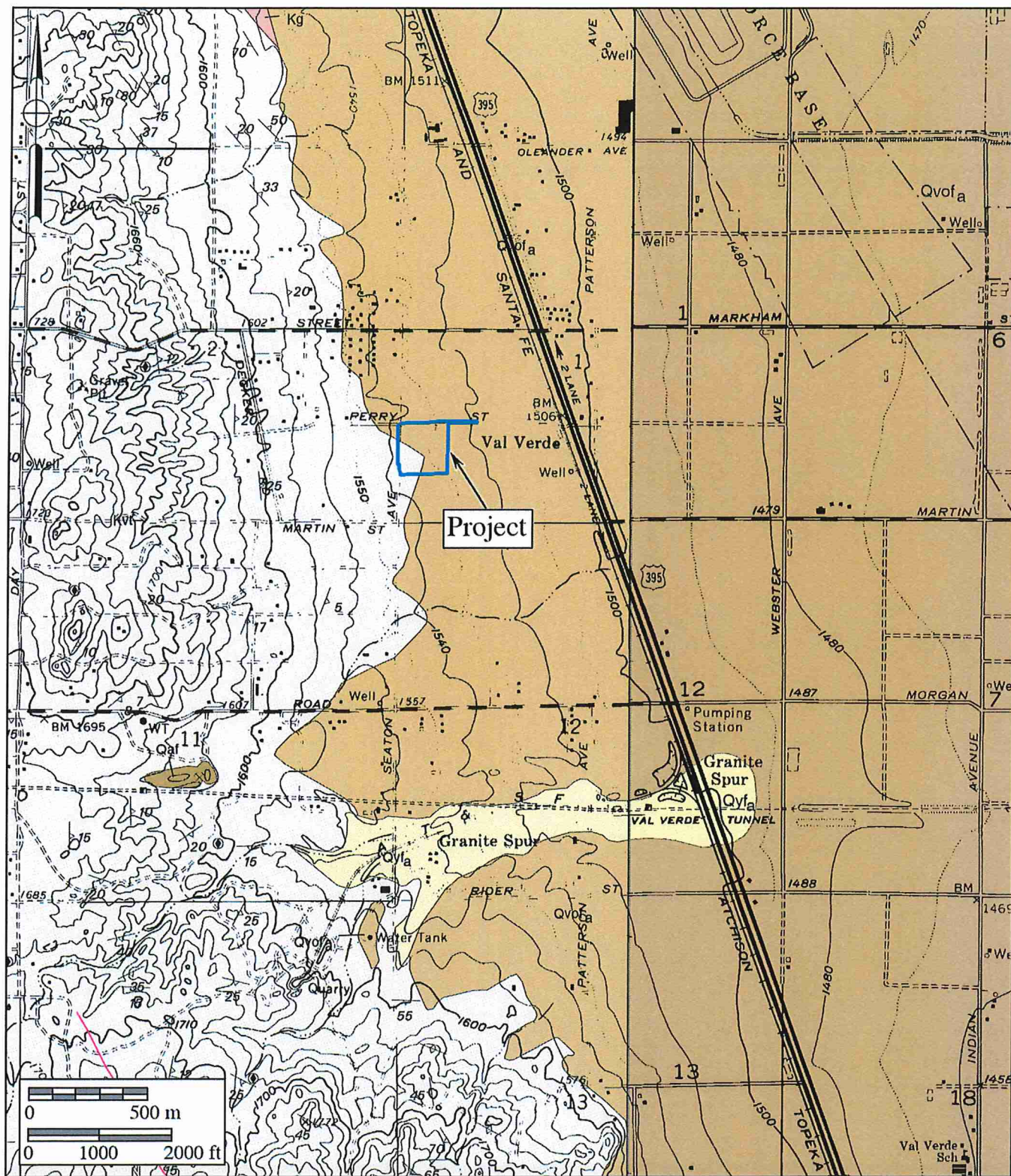
Attachment 2

Project Location Map

The Seaton Commerce Center Project

USGS Steele Peak and Perris Quadrangles (7.5 minute series)





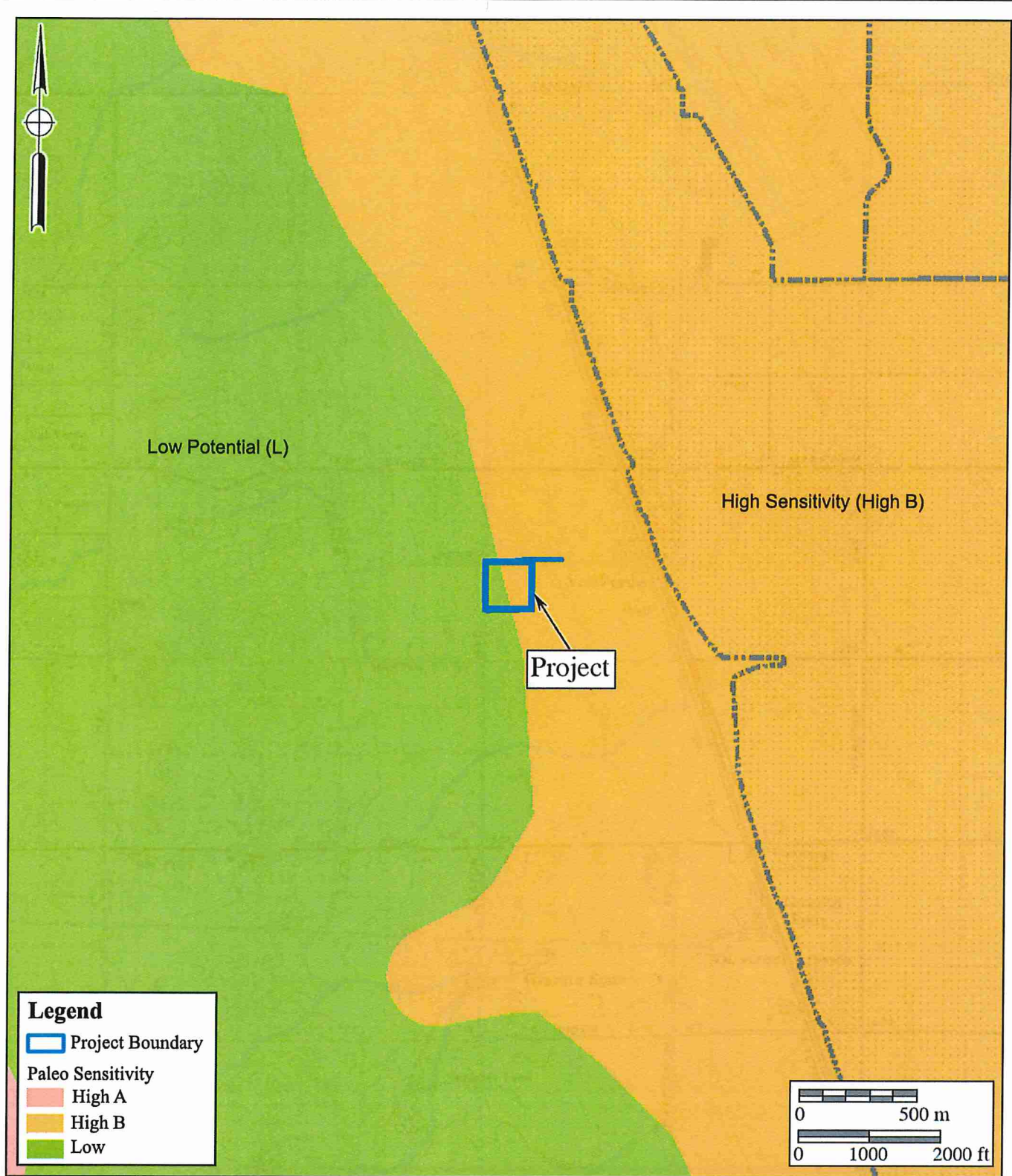
Attachment 3

Geologic Map

The Seaton Commerce Center Project

Geology after Morton (2001) and Morton (2003)





Attachment 4

Paleontological Sensitivity Map

The Seaton Commerce Center Project



SAN BERNARDINO COUNTY MUSEUM

2024 Orange Tree Lane • Redlands, California USA 92374-4560
(909) 307-2669 • Fax (909) 307-0539 • www.sbcountymuseum.org



COUNTY OF SAN BERNARDINO
ECONOMIC DEVELOPMENT
AND PUBLIC SERVICES GROUP

ROBERT L. McKERNAN
Director

11 January 2005

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

re: **PALEONTOLOGY LITERATURE AND RECORDS REVIEW, STRATFORD
RANCH PROJECT (BFSA # 04-175), PERRIS REGION, 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 property north of the City of Perris, Riverside County, California. The study area is located in the western portion of section 5, Township 4 South, Range 3 West, San Bernardino Base and Meridian, as seen on the Perris, California 7.5' United States Geological Survey topographic quadrangle map (1967 edition, photorevised 1973).

Previous geologic mapping (Rogers, 1965; Morton, 2004) indicates that the proposed study area is located primarily upon surface and subsurface early to middle Pleistocene alluvial fan deposits (= unit **Qvof_a**), overlain in the eastern portion of the property by a thin veneer of Holocene alluvial valley deposits (= **Qyv_{sa}**). The Holocene alluvium is too recently deposited to have potential to contain fossil resources, and so is assigned low paleontologic sensitivity. However, the older Pleistocene alluvial deposits have high potential to contain significant nonrenewable paleontologic resources, and so are assigned high paleontologic sensitivity. Similar older Pleistocene sediments throughout Riverside County and the Inland Empire have been reported to yield significant fossils of plants and extinct animals from the Ice Age (Jefferson, 1991; Reynolds and Reynolds, 1991; Woodburne, 1991; Springer and Scott, 1994; Scott, 1997; Springer and others, 1998, 1999; Anderson and others, 2002). 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 (Springer and Scott, 1994; Scott, 1997; Springer and others, 1998, 1999; Anderson and others, 2002).

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 from within the study area, nor from within at least one mile in any direction.

MARK H. UFFER

County Administrative Officer
NORMAN A. KANOLD
Assistant County Administrator
Economic Development and
Public Services Group

Board of Supervisors

BILL POSTMUS	First District	DENNIS HANSBERGER	Third District
PAUL BIANE	Second District	GARY C. QVITT	Fourth District
JOSIE GONZALES	Fifth District		

Recommendations

The results of the literature review and the check of the RPLI at the SBCM demonstrate that excavation in conjunction with development may have high potential to adversely impact significant nonrenewable paleontologic resources present within the boundaries of the proposed Stratford Ranch development. A qualified vertebrate paleontologist must be retained to develop a program to mitigate impacts to such resources. This mitigation program should be consistent with the provisions of the California Environmental Quality Act (Scott and Springer, 2003), as well as with regulations currently implemented by the County of Riverside and the proposed guidelines of the Society of Vertebrate Paleontology. This program should include, but not be limited to:

1. Monitoring of excavation in areas identified as likely to contain paleontologic resources by a qualified paleontologic monitor. Based upon the results of this review, areas of concern include all previously-undisturbed sediments of fossiliferous Pleistocene older alluvium present within the boundaries of the property. Paleontologic monitors should 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. Monitoring may be reduced if the potentially-fossiliferous units described herein are not present, or if present are determined upon exposure and examination by qualified paleontologic personnel to have low potential to contain fossil resources.
2. Preparation of recovered specimens to a point of identification and permanent preservation, including washing of sediments to recover small invertebrates and vertebrates.
3. Identification and curation of specimens into an established, accredited museum repository with permanent retrievable paleontologic storage (e.g., SBCM). 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 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, will signify completion of the program to mitigate impacts to paleontologic resources.

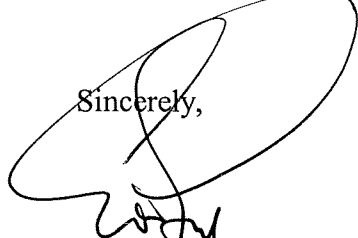
References

- Anderson, R.S., M.J. Power, S.J. Smith, K.B. Springer and E. Scott, 2002. Paleocology of a Middle Wisconsin deposit from southern California. *Quaternary Research* 58(3): 310-317.

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- Reynolds, S.F.B. and R.L. Reynolds, 1991. The Pleistocene beneath our feet: near-surface Pleistocene fossils in inland southern California basins, *in* Inland Southern California: the last 70 million years, M.O. Woodburne, S.F.B. Reynolds, and D.P. Whistler, eds. Redlands, San Bernardino County Museum Special Publication 38(3&4), p. 41-43.
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- Springer, K.B., E. Scott, J.C. Sagebiel and K.M. Scott, 1999. A late Pleistocene lake edge vertebrate assemblage from the Diamond Valley, Riverside County, California. *Journal of Vertebrate Paleontology* 19(3): 77-A.
- Woodburne, M.O., 1991. The Cajon Valley, *in* Inland Southern California: the last 70 million years, M.O. Woodburne, S.F.B. Reynolds, and D.P. Whistler, eds. Redlands, San Bernardino County Museum Special Publication 38(3&4), p. 41-43.

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



SAN BERNARDINO COUNTY MUSEUM

2024 Orange Tree Lane ~ Redlands, California USA 92374-4560
(909) 307-2669 ~ Fax (909) 307-0539 www.sbcountymuseum.org



COUNTY OF SAN BERNARDINO

ROBERT L. McKERNAN
Director

2 April 2013

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

re: **PALEONTOLOGY LITERATURE AND RECORDS REVIEW, ECOS NUEVO
PROJECT, LAKEVIEW HOT SPRINGS REGION, 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 Lakeview Hot Springs region of Riverside County, California. The proposed project property is located in the southeastern quadrant of section 12, Township 4 South, Range 3 West, San Bernardino Base and Meridian, as seen on the Perris, California 7.5' United States Geological Survey topographic quadrangle map (1967 edition).

Previous geologic mapping (Rogers, 1965; Morton, 2003) indicates that the proposed project property is situated entirely upon active valley deposits of recent age (= unit Qv_{sc}) associated with the present-day San Jacinto River. These sediments have low potential to contain significant nonrenewable paleontologic resources in a reliable stratigraphic context, and so are assigned low paleontologic sensitivity. However, these sediments overlie older Pleistocene alluvium (= $Qvof_n$) that has high paleontologic sensitivity. Similar older Pleistocene sediments throughout Riverside and San Bernardino Counties and the Inland Empire have been previously reported to yield significant fossils of plants and extinct animals from the Ice Age (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 two previously-known paleontologic resource localities are recorded by the SBCM within $\frac{1}{4}$ to $\frac{1}{2}$ mile of portions of the proposed study area. These localities, SBCM 5.3.151 and 5.3.153, yielded fossils of late Pleistocene vertebrates including

mammoths, horses, and bison from Pleistocene older alluvium. The proximity of these localities to the proposed project demonstrates the high paleontologic sensitivity of Pleistocene older alluvium at the surface and in the subsurface in this region.

Recommendations

The results of the literature review and the search of the RPLI at the SBCM demonstrate that the above named study area is located on subsurface Pleistocene alluvial sediments with high potential to contain 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 (Scott and Springer, 2003), as well as with regulations implemented by the County of Riverside. This program should include, but not be limited to:

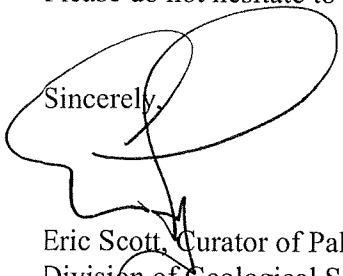
1. Monitoring of excavation into rock units having high potential to contain significant nonrenewable paleontologic resources. Based upon the results of this review, all Pleistocene older alluvial sediments present within the area of potential effect are considered to have high potential to contain such resources. Paleontologic monitors should 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 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 complete until such curation into an established, accredited 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, will signify completion of the program to mitigate impacts to paleontologic resources.

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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