PALEONTOLOGICAL ASSESSMENT FOR THE CIRCLE K BLOOMINGTON PROJECT

BLOOMINGTON
SAN BERNARDINO COUNTY, CALIFORNIA

APN 250-101-76

Prepared for:

Lilburn Corporation
1905 Business Center Drive
San Bernardino, California 92408

Submitted to:

County of San Bernardino
385 North Arrowhead Avenue
San Bernardino, California 92415

Prepared by:

Brian F. Smith and Associates, Inc.
14010 Poway Road, Suite A
Poway, California 92064

July 6, 2022

Paleontological Database Information

Author:	Todd A. Wirths, M.S., Senior Paleontologist, California Professional Geologist No. 7588
Consulting Firm:	Brian F. Smith and Associates, Inc. 14010 Poway Road, Suite A Poway, California 92064 (858) 679-8218
Report Date:	July 6, 2022
Report Title:	Paleontological Assessment for the Circle K Bloomington Project, Bloomington, San Bernardino County, California (APN 250-101-76)
Prepared for:	Lilburn Corporation 1905 Business Center Drive San Bernardino, California 92408
Submitted to:	County of San Bernardino 385 North Arrowhead Avenue San Bernardino, California 92415
Prepared by:	Brian F. Smith and Associates, Inc. 14010 Poway Road, Suite A Poway, California 92064
USGS Quadrangle:	Section 15, Township 1 South, Range 5 West, of the *Fontana, California* (7.5-minute) Quadrangle
Study Area:	3.97 acres
Key Words:	Paleontological assessment; Pleistocene alluvial fan deposits; High sensitivity; Bloomington; San Bernardino County.

Table of Contents

Section **Page**

I. INTRODUCTION AND LOCATION 1
II. REGULATORY SETTING 1
State of California 1
County of San Bernardino 4
III. GEOLOGY 4
IV. PALEONTOLOGICAL RESOURCES 7
Definition 7
Fossil Locality Search 7
Field Survey 7
V. PALEONTOLOGICAL SENSITIVITY 8
Overview 8
Professional Standards 8
County Assessment 9
VI. CONCLUSION AND RECOMMENDATIONS 10
VII. CERTIFICATION 13
VIII. REFERENCES 13

Appendices

Appendix A – Qualifications of Key Personnel
Appendix B – Fossil Locality Search Report

List of Figures

Figure **Page**

Figure 1 General Location Map 2
Figure 2 Project Location Map 3
Figure 3 Geologic Map 6

I. INTRODUCTION AND LOCATION

A paleontological resource assessment has been completed for the Circle K Bloomington Project located at the northeast corner of Cedar Avenue and San Bernardino Avenue in the unincorporated Bloomington neighborhood of San Bernardino County, California (Figures 1 and 2). The project consists of one parcel (Assessor's Parcel Number [250-101-76] of 3.97 acres. On the U.S. Geological Survey (7.5-minute), 1:24,000-scale *Fontana, California* topographic quadrangle map, the project is situated in Section 15, Township 1 South, Range 5 West, of the San Bernardino Baseline and Meridian (see Figure 2).

On the western 1.68 acres of the property, the proposed development includes the construction of a 5,200-square-foot convenience store with an attached 1,262-square-foot fully automated car wash and a fuel canopy with 10 fuel pumps. The proposed development of the remaining 2.29 acres includes a 4,400-square foot drive-thru restaurant and 8,000 square feet of "in-line" retail space. Sewer improvements to the site are also anticipated by the project applicant, which would include an offsite extension of approximately 800 linear feet to the east, connecting to an existing sewer main located at Larch Avenue within the city of Rialto.

As the lead agency, the County of San Bernardino has required the preparation of a paleontological assessment to evaluate the project's potential to yield paleontological resources. The paleontological assessment of the project included a review of paleontological literature and fossil locality records for a previous project in the area; a review of the underlying geology; and recommendations to mitigate impacts to potential paleontological resources. A paleontological field survey was not conducted since the project is currently graded flat and partly developed.

II. REGULATORY SETTING

The California Environmental Quality Act (CEQA), which is patterned after the National Environmental Policy Act, is the overriding environmental regulation that sets the requirement for protecting California's paleontological resources. CEQA mandates that governing permitting agencies (lead agencies) set their own guidelines for the protection of nonrenewable paleontological resources under their jurisdiction.

State of California

Under "Guidelines for Implementation of the California Environmental Quality Act," as amended in December 2018 (California Code of Regulations [CCR] Title 14, Division 6, Chapter 3, Sections 15000 et seq.), procedures define the types of activities, persons, and public agencies required to comply with CEQA. Section 15063 of the CCR provides a process by which a lead agency may review a project's potential impact to the environment, whether the impacts are significant, and provide recommendations, if necessary.

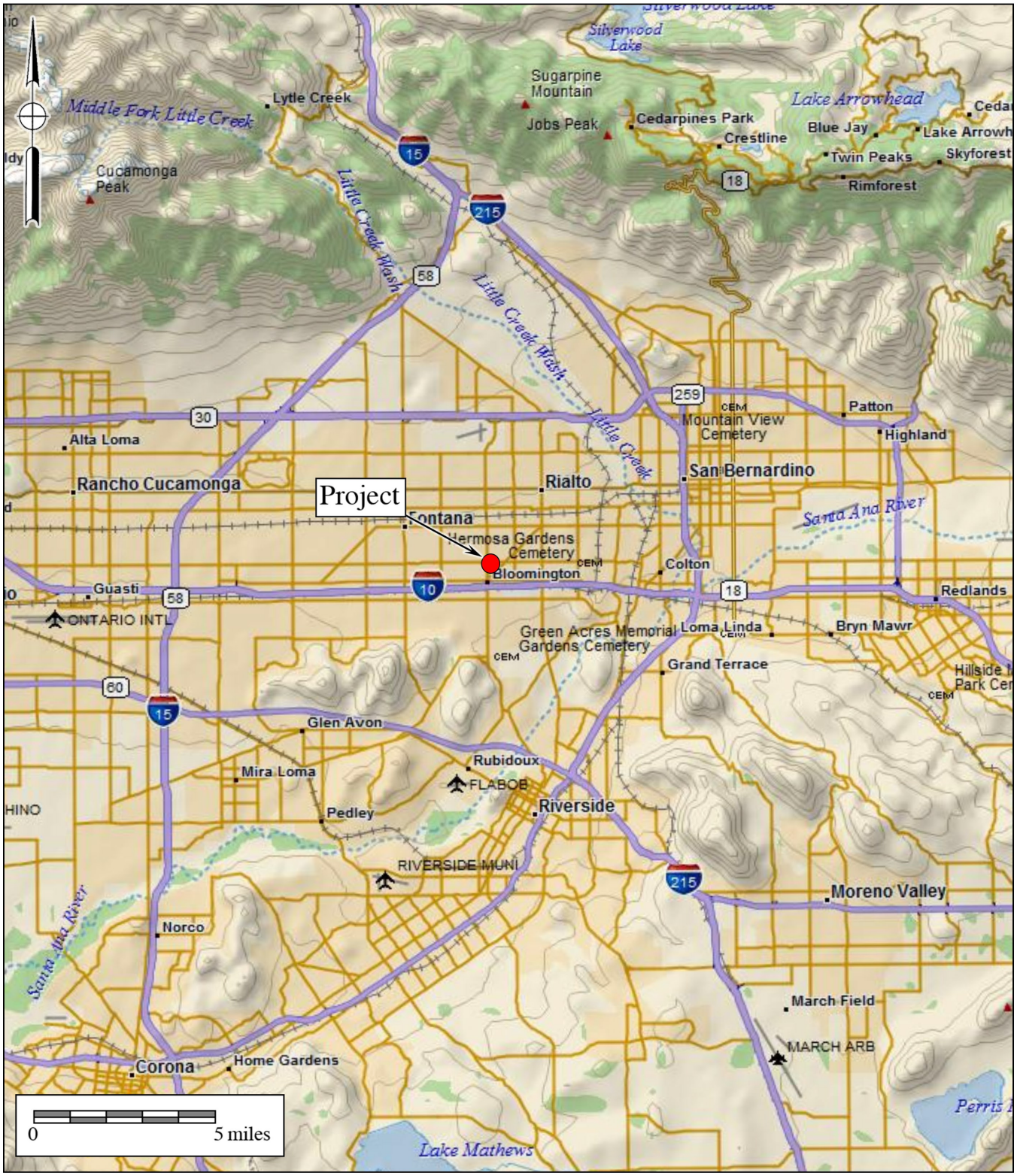

Figure 1.1–1

General Location Map

The Circle K Bloomington Project

DeLorme (1:250,000)

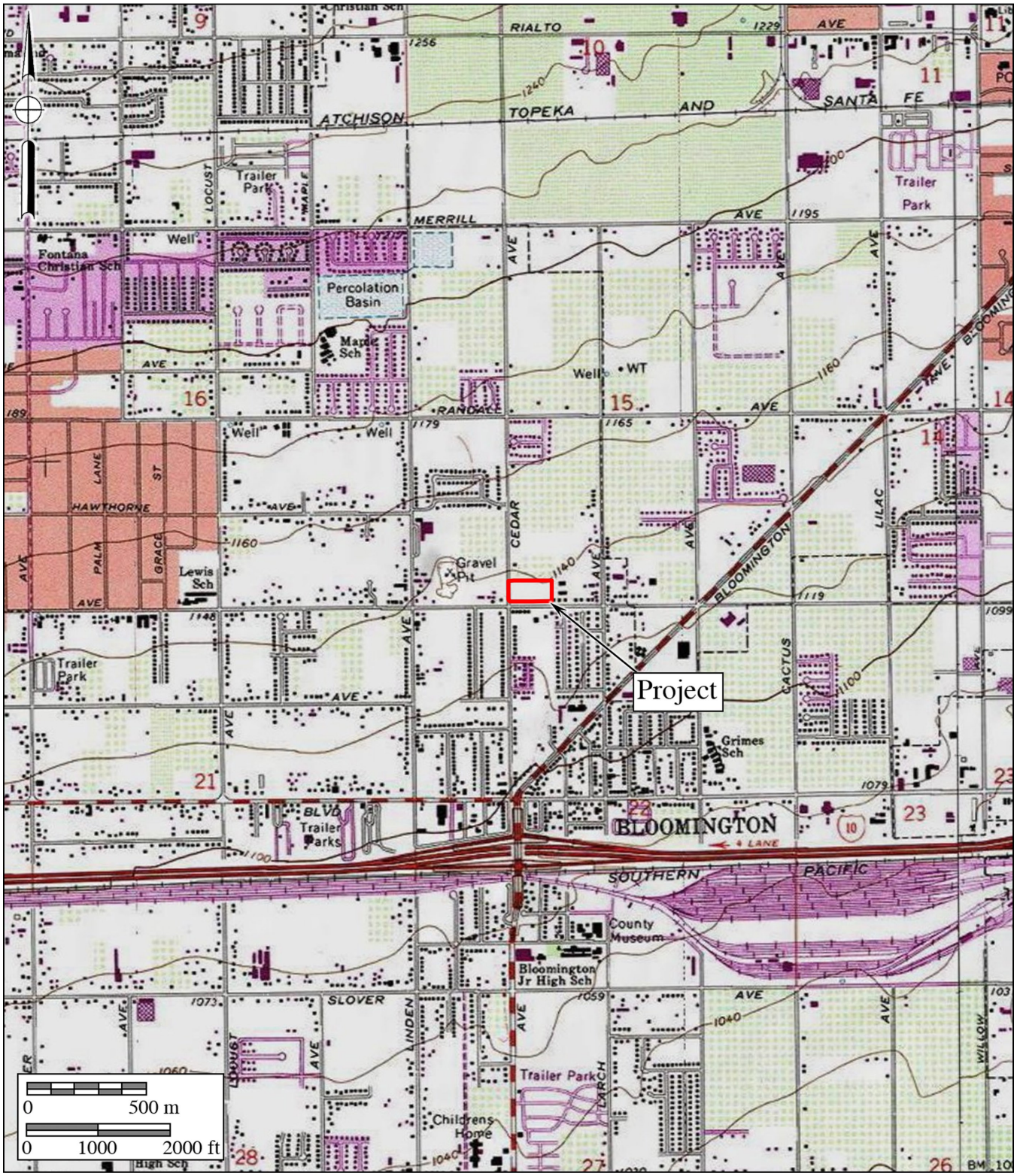

Figure 1.1–2

Project Location Map

The Circle K Bloomington Project

USGS *Fontana* Quadrangle (7.5-minute series)

In CEQA's Environmental Checklist Form, one of the questions to answer is, "Would the project directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?" (Appendix G, Section VII, Part f). This is to ensure compliance with California Public Resources Code Section 5097.5, the law that protects nonrenewable resources including fossils, which is paraphrased below:

a) A person shall not knowingly and willfully excavate upon, or remove, destroy, injure or deface any historic or prehistoric ruins, burial grounds, archaeological or vertebrate paleontological site, including fossilized footprints, inscriptions made by human agency, rock art, or any other archaeological, paleontological or historical feature, situated on public lands, except with the express permission of the public agency having jurisdiction over such lands.
b) As used in this section, "public lands" means lands owned by, or under the jurisdiction of, the state, or any city, county, district, authority, or public corporation, or any agency thereof.
c) A violation of this section is a misdemeanor.

County of San Bernardino

The County of San Bernardino 2007 Development Code has developed criteria for applying guidelines to preserve and protect nonrenewable paleontological resources (County of San Bernardino 2018). In Chapter 82.20, "Paleontologic Resources (PR) Overlay," of the Development Code, Purpose, Location Requirements, Development Standards, and Paleontologist Qualifications are described in Sections 82.20.010 through 82.20.040, respectively (County of San Bernardino 2018).

III. GEOLOGY

The project is located near the western margin and distal southern end of the broad Lytle Creek alluvial fan that emanates from the San Gabriel Mountains approximately 10 miles to the north as a result of uplift and dissection of the eastern San Gabriel Mountains. The main source of these sediments is from the Lytle Creek drainage, near where the northwest-southeast-trending San Andreas fault zone cuts across and separates the San Gabriel and San Bernardino mountain ranges (Morton and Miller 2006). Geomorphically, the project occupies the Fontana Plain (Dutcher and Garrett 1963) and is relatively flat-lying, with a gentle slope to the south (see Figures 2 and 3). Geologically, most of the project property is mapped as young alluvial fan deposits of Lytle Creek (large area colored yellow and labeled "Qyfl" on Figure 3; after Morton 2003) that are Holocene and late Pleistocene in age, a period of time spanning up to approximately 120,000 years ago (Cohen and Gibbard 2011). Morton (2003) describes these

deposits as unconsolidated, cobbly and bouldery alluvium composing the Lytle Creek alluvial fan. Dutcher and Garrett (1963) indicate that the young alluvial fan deposits may exceed one hundred feet thick in some areas of the Fontana-San Bernardino-Redlands region but show that these deposits are approximately 15 feet thick (Pl. 7, cross-section G-G') for a broad area in the Fontana Plain about one to two miles northeast of the project.

The eastern portion of the project, including the proposed offsite sewer pipeline, is mapped as late to middle Pleistocene-aged old alluvial fan deposits (Morton 2003; Dutcher and Garrett 1963), deposited roughly between 11,700 to 780,000 years ago (Cohen and Gibbard 2011). Outcrops of these older deposits are shown on Figure 3 as brown areas labeled "Qof_2", and are described as unconsolidated but indurated, cobbly and bouldery alluvium of the Lytle Creek fan (Morton 2003). These older deposits underlie the young alluvial fan deposits of Lytle Creek.

IV. PALEONTOLOGICAL RESOURCES

Definition

Paleontological resources are the remains of prehistoric life that have been preserved in geologic strata. These remains are called fossils and include bones, shells, teeth, and plant remains (including their impressions, casts, and molds) in the sedimentary matrix, as well as trace fossils such as footprints and burrows. Fossils are considered older than 5,000 years of age (Society of Vertebrate Paleontology 2010) but may include younger remains (subfossils) when viewed in the context of local extinction of the organism or habitat, for example. Fossils are considered a nonrenewable resource under state, county, and local guidelines (Section II of this report).

Fossil Locality Search

A prior paleontological collections and locality records search was conducted for the project by the San Bernardino County Museum (SBCM) in Redlands (Kottcamp 2022, Appendix B). The closest known fossils are located approximately 4.4 miles to the east-northeast, consisting of the remains of Pleistocene wood recovered from deep sediments during drilling projects. The next closest are two Pleistocene-aged localities about 4.5 miles away. Mastodon bones were found south of the project, about 25 feet below the surface (SBCM loc. 5.1.22). The second locality is to the west in the Declezville neighborhood of Fontana, which yielded the remains of a saber-toothed cat just five feet below the surface (SBCM loc. 5.1.11).

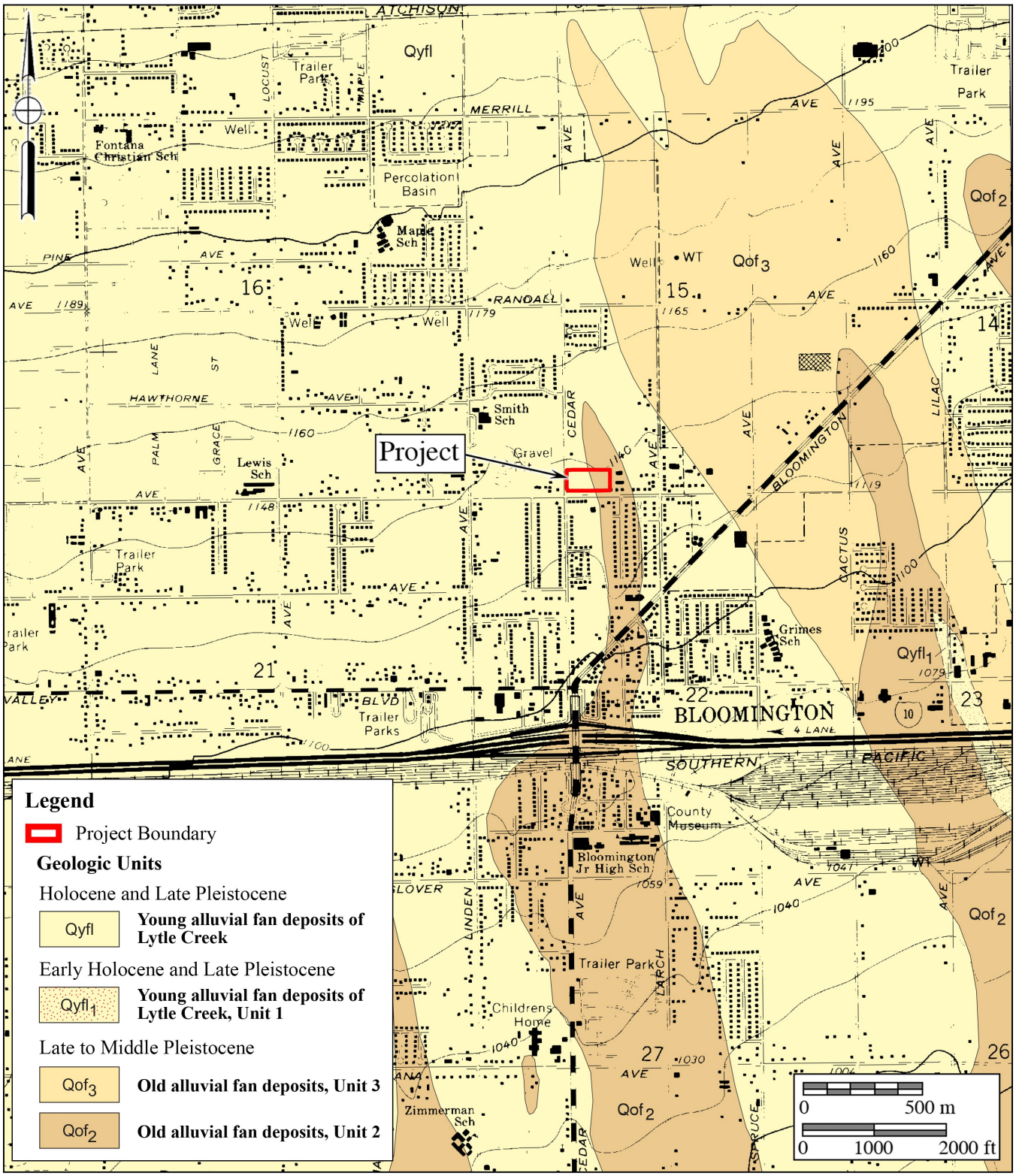

Figure 3

Geologic Map

The Circle K Bloomington Project

Geology after Morton (2003)

Kottcamp (2022) indicates that "these and other older alluvial sedimentary units, which may be buried below the surface, were deposited between approximately 1.8 million to approximately 11,000 years ago. Pleistocene age alluvial deposits have been found to be highly fossiliferous in the local area, yielding the remains of mastodons, mammoths, *Smilodon*, camels, horses, bison, and ground sloths, as well as microfossils including rodents."

Field Survey

Personnel directed by Principal Paleontologist Todd A. Wirths conducted the paleontological survey for the Circle K Bloomington Project on June 17, 2022. The survey was an intensive reconnaissance consisting of a series of transects across the project. The field methodology employed for the project included walking evenly spaced survey transects set approximately 10 meters apart while visually inspecting the ground surface. At the time of the survey, the project was vacant and had been mowed prior to the field visit. The grass clippings were not removed, covered the property, and rendered ground visibility to be approximately 50 to 75 percent. According to the aerial photographs, the property was cleared and used agriculturally from at least 1938, but it is unclear when agriculture operations ceased. No paleontological resources, or evidence suggesting the presence of paleontological resources, were observed at the project.

V. PALEONTOLOGICAL SENSITIVITY

Overview

The degree of paleontological sensitivity of any particular area is based on a number of factors, including 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. Holocene alluvium is generally considered to be geologically too young to contain significant nonrenewable paleontological resources (*i.e.*, fossils) and is thus typically assigned a low paleontological sensitivity. Pleistocene (over 11,700 years old) alluvial and alluvial fan deposits in the Inland Empire, such as those that underlie the project ("Qof_2" on Figure 3), however, often yield important terrestrial vertebrate fossils, such as extinct mammoths, mastodons, giant ground sloths, extinct species of horse, bison, camel, saber-toothed cats, and others (Kottcamp 2022, attached). These Pleistocene sediments are thus accorded a High paleontological resource sensitivity.

Professional Standards

The Society of Vertebrate Paleontology (SVP 2010) has drafted guidelines that include four categories of paleontological sensitivity for geologic units (formations) that might be

impacted by a proposed project, as listed below:

- *High Potential:* Rock units from which vertebrate or significant invertebrate, plant, or trace fossils have been recovered.
- *Undetermined Potential:* Rock units for which little information is available concerning their paleontological content, geologic age, and depositional environment, and that further study is needed to determine the potential of the rock unit.
- *Low Potential:* Rock units that are poorly represented by fossil specimens in institutional collections or based on a general scientific consensus that only preserve fossils in rare circumstances.
- *No Potential:* Rock units that have no potential to contain significant paleontological resources, such as high-grade metamorphic rocks and plutonic igneous rocks.

Using these criteria, based on the presence of nearby significant fossil localities (SBCM locs. 5.1.11 and 5.1.19 to 5.1.22) and the strong likelihood that the nearby fossil localities originated from the same geologic formation as that which underlies the project at depth, the Pleistocene old alluvial fan deposits can be considered to have a high potential to yield significant paleontological resources. The Holocene to Pleistocene young alluvial fan deposits may be considered to have a low potential for near-surface deposits, to an undetermined potential with depth, as the deposits become older.

County Assessment

The County of San Bernardino applies its "Paleontologic Resources (PR) Overlay" guideline to those areas where paleontological resources are known to occur or are likely to be present by using fossil location criteria reported by the SBCM, the University of California Museum of Paleontology (Berkeley), the Los Angeles County Natural History Museum, or other institutions (County of San Bernardino 2018, Section 82.20.020). The reported presence of paleontological resources by the SBCM near the project in a similar geologic setting and in similar mapped rock units follows the County's definition for mitigation and preservation of nonrenewable paleontological resources (County of San Bernardino 2018, Section 82.20.010). Therefore, the project is subject to remain in compliance within the County's Paleontologic Resources Overlay, Section 82.20.030 (County of San Bernardino 2018). Thus, the following criteria are to be used to evaluate the project's compliance with the intent of the overlay:

a. **Field survey before grading.** In areas of potential but unknown sensitivity, field surveys before grading shall be required to establish the need for paleontologic monitoring.
b. **Monitoring during grading.** A project that requires grading plans and is located in an area of known fossil occurrence within the overlay, or that has

been demonstrated to have fossils present in a field survey, shall have all grading monitored by trained paleontologic crews working under the direction of a qualified professional, so that fossils exposed during grading can be recovered and preserved. Paleontologic monitors 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 the remains of small fossil invertebrates and vertebrates. Monitors shall be empowered to temporarily halt or divert equipment to allow removal of abundant or large specimens. Monitoring is not necessary if the potentially-fossiliferous units described for the property in question are not present, or if present are determined upon exposure and examination by qualified paleontologic personnel to have low potential to contain fossil resources.

c. **Recovered specimens.** Qualified paleontologic personnel shall prepare 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 is essential in order to fully mitigate adverse impacts to the resources.

d. **Identification and curation of specimens.** Qualified paleontologic personnel shall identify and curate specimens into the collections of the Division of Geological Sciences, San Bernardino County Museum, an established, accredited museum repository with permanent retrievable paleontologic storage. These procedures are also essential steps in effective paleontologic mitigation and CEQA compliance. 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 curation into an established museum repository has been fully completed and documented.

e. **Report of findings.** Qualified paleontologic personnel shall prepare a report of findings with an appended itemized of specimens. A preliminary report shall be submitted and approved before granting of building permits, and a final report shall be submitted and approved before granting of occupancy permits. The report and inventory, when submitted to the appropriate lead agency along with confirmation of the curation of recovered specimens into the collections of the San Bernardino County Museum, will signify completion of the program to mitigate impacts to paleontologic resources.

f. **Mitigation financial limits.** In no event shall the County require the applicant to pay more for mitigation as required by Subsections (b), (c), and (d), above within the site of the project than the following amounts:

   1. One-half of one percent of the projected cost of the project, if the project

is a commercial or industrial project;

2. Three-fourths of one percent of the projected cost of the project for a housing project consisting of one unit; and
3. If a housing project consists of more than one unit, three-fourths of one percent of the projected cost of the first unit plus the sum of the following:
    A. $200 per unit for any of the next 99 units;
    B. $150 per unit for any of the next 400 units; and
    C. $100 per unit for units in excess of 500.

VI. CONCLUSIONS AND RECOMMENDATIONS

Research has confirmed the existence of potentially fossiliferous late Pleistocene old alluvial fan deposits ("Qof_2" on Figure 3) mapped at the surface of the eastern portion of the project. This includes the proposed offsite sewer pipeline directed east of the project property. These deposits likely underlie the Holocene and late Pleistocene young alluvial fan sediments mapped at the surface ("Qyfl" on Figure 3) of the remaining area project. The occurrence of terrestrial vertebrate fossils at shallow depths from Pleistocene alluvial fan sediments across the Inland Empire of western Riverside County is well documented. The "High" paleontological sensitivity rating typically assigned to Pleistocene alluvial fan sediments for yielding paleontological resources supports the recommendation that paleontological monitoring be implemented during mass grading and excavation activities in undisturbed Pleistocene old alluvial fan sediments to mitigate any adverse impacts (loss or destruction) to potential nonrenewable paleontological resources. Full-time monitoring of undisturbed Pleistocene old alluvial fan deposits at the project is warranted starting at the surface. For areas mapped as young alluvial fan deposits, full-time monitoring is recommended starting at a depth of five feet below the surface.

If a fossil(s) is found at shallower depths, earth disturbance activities should be halted within a radius of 50 feet from the location of the fossil, and a qualified, project-level paleontologist shall be consulted to determine the significance of the fossilized remains. If the fossil is deemed significant by the paleontologist, full-time monitoring should be initiated at the project.

Based on the conclusions and recommendations outlined above, a Paleontological Resource Impact Mitigation Program (PRIMP) is recommended prior to approval of the grading permit. A suggested PRIMP is outlined below. When implemented with the provisions of CEQA, the County of San Bernardino (2018), and the guidelines of the SVP (2010), this PRIMP would mitigate any adverse impacts (loss or destruction) to potential nonrenewable paleontological resources (fossils), if present, to a level below significant.

1. Monitoring of mass grading and excavation activities in areas identified as likely to

contain paleontological resources shall be performed by a qualified paleontologist or paleontological monitor. Starting at the surface, monitoring will be conducted full-time in areas of grading or excavation in undisturbed sediments of old alluvial fan deposits. Monitoring shall be conducted full-time at a depth of five feet deep in areas of grading or excavation in undisturbed sediments mapped as young alluvial fan deposits

2. If a fossil(s) is found at a shallower depth, earth disturbance activities should be halted within a radius of 50 feet from the location of the fossil, and a project-level paleontologist shall be consulted to determine the significance of the fossilized remains. If the fossil is deemed significant by the project-level paleontologist, full-time monitoring should be initiated at the project.
3. Paleontological monitors will be equipped to salvage fossils as they are unearthed to avoid construction delays. The monitor must be empowered to temporarily halt or divert equipment to allow removal of abundant or large specimens in a timely manner. Monitoring may be reduced if the potentially fossiliferous units are not present in the subsurface, or, if present, are determined on exposure and examination by qualified paleontological personnel to have low potential to contain fossil resources. The monitor shall notify the project paleontologist, who will then notify the concerned parties of the discovery.
4. Paleontological salvage during trenching and boring activities is typically from the generated spoils and does not delay the trenching or drilling activities. 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, which is photographed before it is vacated and the fossils are removed to a safe place. On mass grading projects, discovered fossil sites are protected by flagging to prevent them from being overrun by earthmovers (scrapers) before salvage begins. Fossils are collected in a similar manner, with notes and photographs being taken before removing the fossils. Precise location of the site is determined with the use of handheld GPS units. If the site involves remains from a large terrestrial vertebrate, such as large bone(s) or a mammoth tusk, that is/are too large to be easily removed by a single monitor, a fossil recovery crew shall excavate around the find, encase the find within a plaster and burlap jacket, and remove it after the plaster is set. For large fossils, use of the contractor's construction equipment may be solicited to help remove the jacket to a safe location.
5. Isolated fossils are collected by hand, wrapped in paper, and placed in temporary collecting flats or five-gallon buckets. Notes are taken on the map location and stratigraphy of the site, which is photographed before it is vacated and the fossils are removed to a safe place.
6. Particularly small invertebrate fossils typically represent multiple specimens of a

limited number of organisms, and a scientifically suitable sample can be obtained from 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 vertebrate fossils, the test is usually the observed presence of small pieces of bones within the sediments. If present, multiple five-gallon buckets of sediment can be collected and returned to a separate facility to wet-screen the sediment.

7. In accordance with the "Microfossil Salvage" section of the Society of Vertebrate Paleontology guidelines (2010:7), bulk sampling and screening of fine-grained sedimentary deposits (including carbonate-rich paleosols) must be performed if the deposits are identified to possess indications of producing fossil "microvertebrates" to test the feasibility of the deposit to yield fossil bones and teeth.
8. In the laboratory, individual fossils are cleaned of extraneous matrix, any breaks are repaired, and the specimen, if needed, is stabilized by soaking in an archivally approved acrylic hardener (*e.g.*, a solution of acetone and Paraloid B-72).
9. Recovered specimens are prepared to a point of identification and permanent preservation (not display), including screen-washing sediments to recover small invertebrates and vertebrates. Preparation of individual vertebrate fossils is often more time-consuming than for accumulations of invertebrate fossils.
10. Identification and curation of specimens into a professional, accredited public museum repository with a commitment to archival conservation and permanent retrievable storage (*e.g.*, the San Bernardino County Museum) shall be conducted. The paleontological program should include a written repository agreement prior to the initiation of mitigation activities. Prior to curation, the lead agency (*e.g.*, the County of San Bernardino) will be consulted on the repository/museum to receive the fossil material.
11. A final report of findings and significance will be prepared, including lists of all fossils recovered and necessary maps and graphics to accurately record their original location(s). The report, when submitted to, and accepted by, the appropriate lead agency, will signify satisfactory completion of the project program to mitigate impacts to any potential nonrenewable paleontological resources (*i.e.*, fossils) that might have been lost or otherwise adversely affected without such a program in place.

VII. CERTIFICATION

July 6, 2022

Todd A. Wirths
Date

Senior Paleontologist
California Professional Geologist No. 7588

VIII. REFERENCES

Cohen, K.M., and Gibbard, P.L. 2011. Global chronostratigraphical correlation table for the last 2.7 million years. Subcommission on Quaternary Stratigraphy (International Commission on Stratigraphy), Cambridge, England. http://quaternary.stratigraphy.org/wp-content/uploads/2018/04/POSTERstratchart-v2011.jpg.pdf.

County of San Bernardino. 2018. County of San Bernardino 2007 Development Code. Prepared for the County of San Bernardino Land Use Services Division by several consultants. Adopted March 13, 2007; effective April 12, 2007; amended May 2, 2019. Electronic document, http://www.sbcounty.gov/Uploads/lus/DevelopmentCode/DCWebsite.pdf.

Dutcher, L.C., and Garrett, A.A. 1963. Geologic and hydrologic features of the San Bernardino area, California - with special reference to underflow across the San Jacinto fault. USGS Water-Supply Paper 1419.

Kottcamp, S. 2022. Paleontology records review for proposed site of Circle K Bloomington, Bloomington, San Bernardino County, California. Unpublished letter report prepared for Brian F. Smith and Associates, Inc., Poway, California, by the Division of Earth Sciences at the San Bernardino County Museum, Redlands, California.

Morton, D.M. 2003. Preliminary geologic map of the Fontana 7.5' Quadrangle, San Bernardino and Riverside Counties, California, Version 1.0: U. S. Geological Survey Open-File Report 03-418, scale 1:24,000.

Morton, D.M. and Miller, F.K. 2006. Geologic map of the San Bernardino and Santa Ana 30' x 60' quadrangles, California: U.S. Geological Survey Open-File Report 06-1217, scale 1:100,000.

Society of Vertebrate Paleontology. 2010. Standard procedures for the assessment and mitigation of adverse impacts to paleontological resources; by the SVP Impact Mitigation

Guidelines Revision Committee: https://vertpaleo.org/wp-content/uploads/2021/01/SVP_Impact_Mitigation_Guidelines-1.pdf.

APPENDIX A

Qualifications of Key Personnel

Todd A. Wirths, MS, PG No. 7588

Senior Paleontologist

Brian F. Smith and Associates, Inc.
14010 Poway Road • Suite A •
Phone: (858) 679-8218 • Fax: (858) 679-9896 • E-Mail: twirths@bfsa-ca.com

Education

Master of Science, Geological Sciences, San Diego State University, California **1995**

Bachelor of Arts, Earth Sciences, University of California, Santa Cruz **1992**

Professional Certifications

California Professional Geologist #7588, 2003
Riverside County Approved Paleontologist
San Diego County Qualified Paleontologist
Orange County Certified Paleontologist
OSHA HAZWOPER 40-hour trained; current 8-hour annual refresher

Professional Memberships

Board member, San Diego Geological Society
San Diego Association of Geologists; past President (2012) and Vice President (2011)
South Coast Geological Society
Southern California Paleontological Society

Experience

Mr. Wirths has more than a dozen years of professional experience as a senior-level paleontologist throughout southern California. He is also a certified California Professional Geologist. At BFSA, Mr. Wirths conducts on-site paleontological monitoring, trains and supervises junior staff, and performs all research and reporting duties for locations throughout Los Angeles, Ventura, San Bernardino, Riverside, Orange, San Diego, and Imperial Counties. Mr. Wirths was formerly a senior project manager conducting environmental investigations and remediation projects for petroleum hydrocarbon-impacted sites across southern California.

Selected Recent Reports

2019 *Paleontological Assessment for the 10575 Foothill Boulevard Project, City of Rancho Cucamonga, San Bernardino County, California*. Prepared for T&B Planning, Inc. Report on file at Brian F. Smith and Associates, Inc., Poway, California.

2019 *Paleontological Assessment for the MorningStar Marguerite Project, Mission Viejo, Orange County, California.* Prepared for T&B Planning. Report on file at Brian F. Smith and Associates, Inc., Poway, California.

2019 *Paleontological Monitoring Report for the Nimitz Crossing Project, City of San Diego.* Prepared for Voltaire 24, LP. Report on file at Brian F. Smith and Associates, Inc., Poway, California.

2019 *Paleontological Resource Impact Mitigation Program (PRIMP) for the Jack Rabbit Trail Logistics Center Project, City of Beaumont, Riverside County, California.* Prepared for JRT BP 1, LLC. Report on file at Brian F. Smith and Associates, Inc., Poway, California.

2020 *Paleontological Monitoring Report for the Oceanside Beachfront Resort Project, Oceanside, San California.* Prepared for S.D. Malkin Properties. Report on file at Brian F. Smith and Associates, Inc., Poway, California.

2020 *Paleontological Resource Impact Mitigation Program for the Nakase Project, Lake Forest, Orange County, San California.* Prepared for Glenn Lukos Associates, Inc. Report on file at Brian F. Smith and Associates, Inc., Poway, California.

2020 *Paleontological Resource Impact Mitigation Program for the Sunset Crossroads Project, Banning, Riverside County*. Prepared for NP Banning Industrial, LLC. Report on file at Brian F. Smith and Associates, Inc., Poway, California.

2020 *Paleontological Assessment for the Ortega Plaza Project, Lake Elsinore, Riverside County*. Prepared for Empire Design Group. Report on file at Brian F. Smith and Associates, Inc., Poway, California.

2020 *Paleontological Resource Record Search Update for the Green River Ranch III Project, Green River Ranch Specific Plan SP00-001, City of Corona, California*. Prepared for Western Realco. Report on file at Brian F. Smith and Associates, Inc., Poway, California.

2020 *Paleontological Assessment for the Cypress/Slover Industrial Center Project, City of Fontana, San Bernardino County, California*. Prepared for T&B Planning, Inc. Report on file at Brian F. Smith and Associates, Inc., Poway, California.

2020 *Paleontological Monitoring Report for the Imperial Landfill Expansion Project (Phase VI, Segment C-2), Imperial County, California*. Prepared for Republic Services, Inc. Report on file at Brian F. Smith and Associates, Inc., Poway, California.

2021 *Paleontological Assessment for the Manitou Court Logistics Center Project, City of Jurupa Valley, Riverside County, California*. Prepared for Link Industrial. Report on file at Brian F. Smith and Associates, Inc., Poway, California.

2021 *Paleontological Resource Impact Mitigation Program for the Del Oro (Tract 36852) Project, Menifee, Riverside County*. Prepared for D.R. Horton. Report on file at Brian F. Smith and Associates, Inc., Poway, California.

2021 *Paleontological Assessment for the Alessandro Corporate Center Project (Planning Case PR-2020-000519), City of Riverside, Riverside County, California*. Prepared for OZI Alessandro, LLC. Report on file at Brian F. Smith and Associates, Inc., Poway, California.

2021 *Paleontological Monitoring Report for the Boardwalk Project, La Jolla, City of San Diego*. Prepared for Project Management Advisors, Inc. Report on file at Brian F. Smith and Associates, Inc., Poway, California.

APPENDIX B

Fossil Locality Search Report

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

SAN BERNARDINO COUNTY

Museum
Division of Earth Science

Scott Kottkamp
Curator of Earth Science

30 June, 2022

Brian F. Smith & Associates, Inc.
Attn: Todd Wirths
14010 Poway Road, Suite A
Poway, CA 92064

PALEONTOLOGY RECORDS REVIEW for proposed site of Circle K Bloomington, Bloomington, San Bernardino County, California

Dear Mr. Wirths,

The Division of Earth Science of the San Bernardino County Museum (SBCM) has completed a records search for the above-named project in Riverside County, California. The proposed project site (Circle K Bloomington) is in the City of Bloomington, California as shown on the United States Geological Survey (USGS) 7.5 minute Fontana, California quadrangle.

Geologic mapping of that region done by Morton (2003) indicates the eastern areas of the proposed project are located atop older alluvial fan deposits of middle to late Pleistocene age (Qof2). These deposits are potentially-fossiliferous, and consist of unconsolidated, tan colored, poorly sorted alluvial fan sediments with a high cobble and boulder content. This particular unit represents a terminating finger of the Lytle Creek Fan, which extends along the surface from the south-southeast. These and other older alluvial sedimentary unit, which may be buried below the surface, were deposited between ~1.8 million to ~11,000 years ago. Pleistocene age alluvial deposits have been found to be highly fossiliferous in the local area, yielding the remains of mastodons, mammoths, *Smilodon*, camels, horses, bison, and ground sloths, as well as microfossils including rodents (Reynolds and Reynolds, 1991). Overall thickness of Pleistocene-age alluvium exceeds several hundred feet in much of the region, and the only other units found at or near the surface locally are non-fossiliferous igneous and metamorphic strata of Cretaceous or Paleozoic age (Morton, 2003; Dibblee et al., 2004).

The rest of the project site is situated atop latest Pleistocene and Holocene age alluvial fam deposits of the Lytle Creek Fan (Qyfl), comprised of an unconsolidated and poorly sorted mixture of sand, clay, and gravel covered by soil. This unit covers most of the surface in the Bloomington and Fontana area, and the alluvium's average grain size coarsens as one moves northward. These deposits are unlikely to be fossiliferous themselves, but directly overlie the older Pleistocene alluvial deposits that are. Reynolds and Reynolds (1991) found that Pleistocene sediments in northwestern Riverside County generally lie about 5 – 15 feet below recent Holocene surface sediments. However, the depth of the recent sediments can be highly variable, and the recent alluvium at this site can generally be expected to thin as it nears the surface contact with the older alluvium.

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 resources have been discovered within the proposed project site. The nearest locality, SBCM 1.102.2 is located approximately 4.4 miles to the east-northeast of the project site. Unaltered wood of order Pinales was recovered from a well bore into indeterminate Qof units, at depths of 437 ft., 520 ft., 670 ft., 680 ft., and 725 ft. below the surface. The sediment in which these specimens were found varied by depth, but trended towards dark grey, poorly-sorted, and subrounded silty sands with a gravel component. Additionally, a nearby test well produced a particularly large unaltered log of the family Cupressaceae, broken into four pieces after being struck by the well augur. The log was discovered approximately 300 ft. below the surface in Qof consisting of unconsolidated and light grey colored silt.

The next closest locality, SBCM locality 5.1.22, is approximately 4.5 miles south. Permineralized *Mammut pacificus* bones were discovered at site 5.1.22, within a ditch filled with late Pleistocene age alluvium. The mastodon bones were unearthed from sand approximately 25 feet below the surface. Lastly, SBCM 5.1.11 is approximately 4.5 miles southwest of the proposed project site. Permineralized bones of the saber-toothed cat *Smilodon* sp. were unearthed there, from 5 feet below the surface at an elevation of 1000 feet, during the excavation of a pipeline trench. SBCM 5.1.11 is covered with Holocene alluvium at the surface, overlaying Pleistocene alluvium (where the *Smilodon* was found) by only a few feet.

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

Dibblee, T.W., and Minch, J.A. 2004. Geologic map of the Riverside West/south 1/2 of Fontana quadrangles, San Bernardino and Riverside County, California. Dibblee Geological Foundation. Dibblee Foundation Map DF-128. Scale 1:24,000.
Available at: https://ngmdb.usgs.gov/Prodesc/proddesc_71756.htm (accessed 25 March 2022).

Morton, D.M. 2004. Preliminary geologic map of the Fontana 7.5' quadrangle, Riverside and San Bernardino Counties, California. USGS. Open-File Report OF-2003-418. Scale 1:24,000.
Available at: https://ngmdb.usgs.gov/Prodesc/proddesc_61860.htm (accessed 29 June 2022).

Reynolds, R. E., and Reynolds, R. L. 1991. The Pleistocene Beneath our Feet: Near-surface Pleistocene Fossils from Inland Southern California Basins. San Bernardino County Museum Association Quarterly 38(3 & 4): 41-43.