PALEONTOLOGY TECHNICAL MEMORANDUM FOR THE SAN DIEGO RIVER TRAIL – CARLTON OAKS GOLF COURSE SEGMENT PROJECT, CITIES OF SAN DIEGO AND SANTEE, SAN DIEGO COUNTY, CALIFORNIA

Prepared by:	Kim Scott, Qualified Paleontologist	March 08, 2017 Date
Supervised by:	Sherri M. Gust, Qualified Paleontologist	March 08, 2017 Date
Quality Control by:		Date
Approved by:		Date

Revision	Date	Description
Rev 0		Draft Paleontological Assessment Technical Memorandum
Rev 1	12-16-2016	Revised Paleontological Assessment Technical Memorandum
Rev 2	12-28-2016	Revised Paleontological Assessment Technical Memorandum

Under contract to: Nasland Engineering, 4740 Ruffner Street, San Diego, CA 92111

March 2017

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LIST OF ACRONYMS AND ABBREVIATIONS

B.A.	Bachelor of Arts
B.S.	Bachelor of Science
BLM	Bureau of Land Management
CEQA	California Environmental Quality Act
Cogstone	Cogstone Resource Management Inc.
GIS	Geographic Information System
LACMIP	Natural History Museum of Los County Department of Invertebrate Paleontology
M.A.	Master of Arts
M.S.	Master of Sciences
PBDB	Paleobiology Database
PFYC	Potential Fossil Yield Classification
project	Carlton Oaks Golf Course Segment of the SDRT
SDNHM	San Diego Museum of Natural History
SDRT	San Diego River Trail
UCMP	University of California Museum of Paleontology
USGS	United States Geological Survey

EXECUTIVE SUMMARY

The purpose of this study was to identify any possible paleontological resources that could be present in the Carlton Oaks Golf Course Segment of the San Diego River Trail (SDRT) located within the cities of San Diego and Santee, San Diego County, California. The proposed project would consist of a Class I bikeway for the exclusive use of people walking and riding bikes and related physical improvements. It would extend a distance of approximately two miles between Carlton Hills Boulevard and West Hills Parkway through Mast Park, Mast Park West, and the Carlton Oaks Golf Course.

The project is mapped as Holocene alluvium adjacent to the San Diego River channel with artificial fill present near Carlton Oaks Drive. At depth along the western end, Quaternary older alluvium and the Eocene Friars Formation are present but are unlikely to be impacted as the wall footings planned are entirely in artificial fill.

A record search of all areas of temporary and permanent impacts and a one mile radius outside of the areas of temporary impacts was requested from the San Diego Natural History Museum. Online record searches were also performed along with print sources. No records of fossils were found from sediments inside, or within a one mile radius of, the project boundaries

An intensive-level pedestrian survey of the ground disturbance portion of the project area was conducted on November 22, 2016. All undeveloped areas within the ground disturbance portion of the project area were examined for paleontological resources. Ground visibility in most of the project area was generally poor, owing to the presence of heavy vegetation and hardscaping. Visible ground surface was closely inspected. No paleontological resources were observed.

Holocene sediments are given a low Potential Fossil Yield Classification (PFYC 2) sensitivity. Artificial fill is given a very low (PFYC 1) sensitivity. Although Pleistocene deposits and the much older Friars Formation in San Diego County are fossiliferous, Holocene deposits and artificial fill do not contain the fossils of extinct animals. Most of the project is to be graded to a depth of approximately 2.5 to 3 feet below surface with minor cuts for walls at the western end to approximately five feet deep. It is anticipated that only artificial fill will be encountered.

It is highly unlikely that fossils will be discovered given the sediments present and the depth of planned excavations. If unanticipated discoveries are made all work must halt within 50 feet until a paleontologist can evaluate the find.

INTRODUCTION

PURPOSE OF STUDY

The purpose of this study was to identify any possible paleontological resources that could be present in the Carlton Oaks Golf Course Segment of the SDRT located within the cities of San Diego and Santee, San Diego County, California (Figure 1).

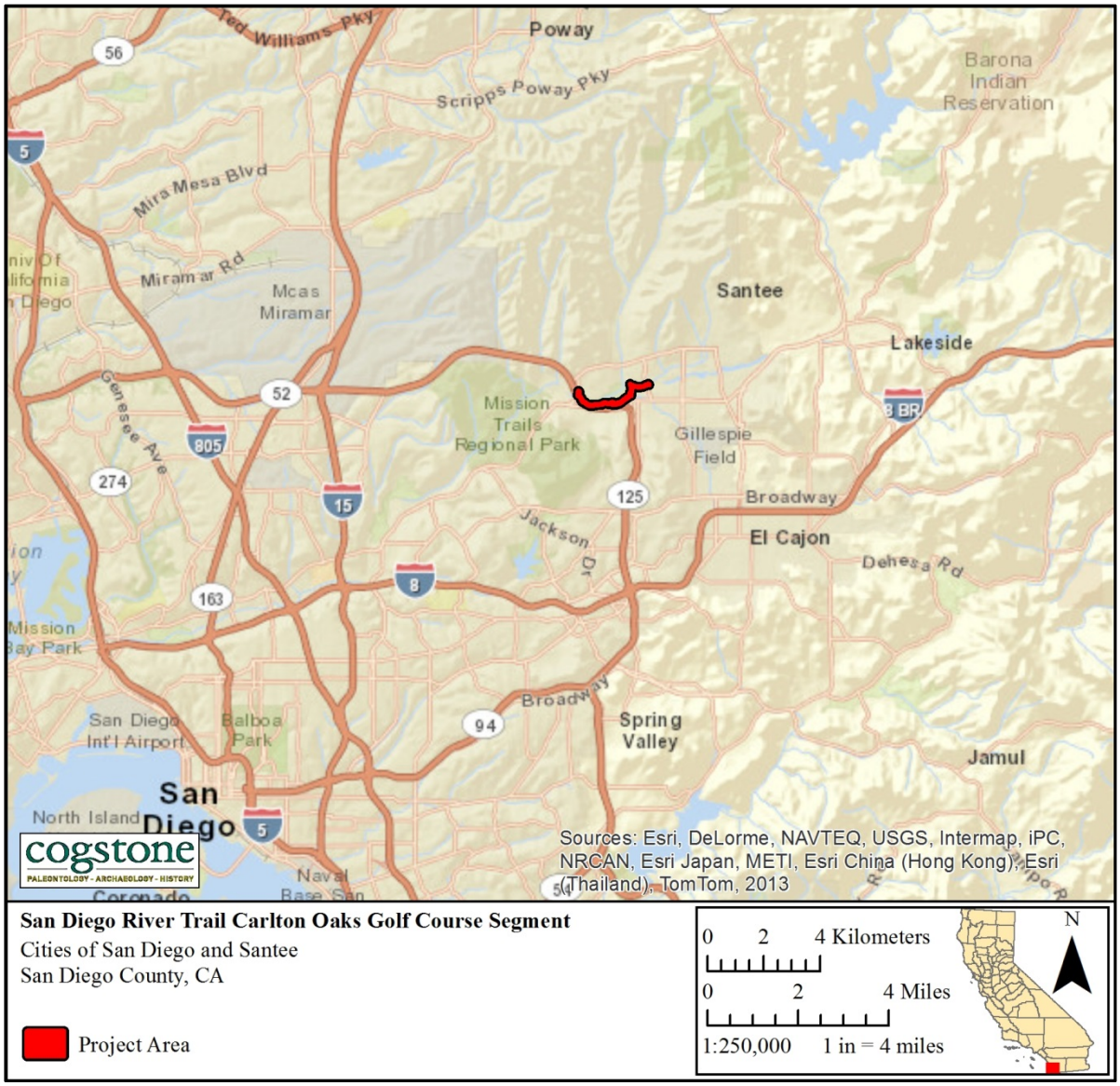

Figure 1. Project vicinity

PROJECT LOCATION AND DESCRIPTION

The San Diego Association of Governments (SANDAG) proposes to construct the Carlton Oaks Golf Course Segment of the San Diego River Trail (SDRT) within the cities of San Diego and Santee (the proposed project). The proposed project would consist of a Class I bikeway for the exclusive use of people walking and riding bikes and related physical improvements. It would extend a distance of approximately two miles between Carlton Hills Boulevard and West Hills Parkway through Mast Park, Mast Park West, and the Carlton Oaks Golf Course.

Specifically, the proposed project would extend westward from the Mast Park parking lot, under the Carlton Hills Boulevard bridge, and along the existing dirt trail that continues westward for approximately 0.5 mile through Mast Park West and terminates at the Carlton Oaks Golf Course. West of the terminus of the existing dirt trail, the proposed project would generally be constructed on or adjacent to the existing berm along the southern edge of the golf course for a distance of approximately 1.5 miles before its terminus at the existing sidewalk along West Hills Parkway. In general, the proposed project would include a 10-foot-wide paved bike path with 2-foot-wide pervious shoulders. Near the west end, the proposed project would install a bridge or similar structure to cross Sycamore Creek. Additional physical improvements could include installation of fencing, pedestrian-scaled lighting for safety, slope protection in slope areas south of the existing berm in which erosion is evident, removal and replacement of low flow drainage crossings along Mast Park West, revegetation of slopes, restoration of disturbed areas within the golf course, retaining walls, and other minor improvements.

Construction of the project is estimated to begin in late 2018 and take approximately 12 months to complete. Construction staging is anticipated to occur within the golf course and will avoid sensitive biological resources. Access during construction could be provided from West Hills Parkway; an existing dirt road within a utility easement along the eastern boundary of the golf course accessible from Carlton Oaks Drive; and/or from the parking lot at Mast Park, which could require excavation under the Carlton Hills Boulevard bridge to provide adequate vertical clearance for construction equipment, and along the existing dirt trail in Mast Park West. Some construction access points would require a temporary construction easement or other permission/agreement from property owners before use for construction access.

The project is located in the El Cajon and La Mesa 7.5’ USGS topographic quadrangles within Sections 29 and 30 of Township 15 South, Range 1 West, San Bernardino Base Meridian (Figure 2). Generally, the eastern half of the bike path is located in the City of Santee and the western half is located in the City of San Diego.

The project area includes both the direct Project Study Area (PSA) and indirect PSA. The direct PSA was established as the project footprint, which includes all areas of permanent and

temporary impacts. The indirect PSA was established as the legal parcel in which the direct PSA is located. The direct PSA measures 17 acres and the indirect PSA measures 262 acres (Figures 3A-3E).

The depth of excavation along the entire bike path would be approximately 2.5 feet. The depth of excavation for the installation of a retention wall would be approximately five feet along the east slope of West Hills Parkway where the bike path would connect to West Hills Parkway. The excavation of the retention wall is expected to be within a fill condition. Excavation under the Carlton Hills Boulevard Bridge for the construction access road would be approximately 3 feet, also within a fill condition.

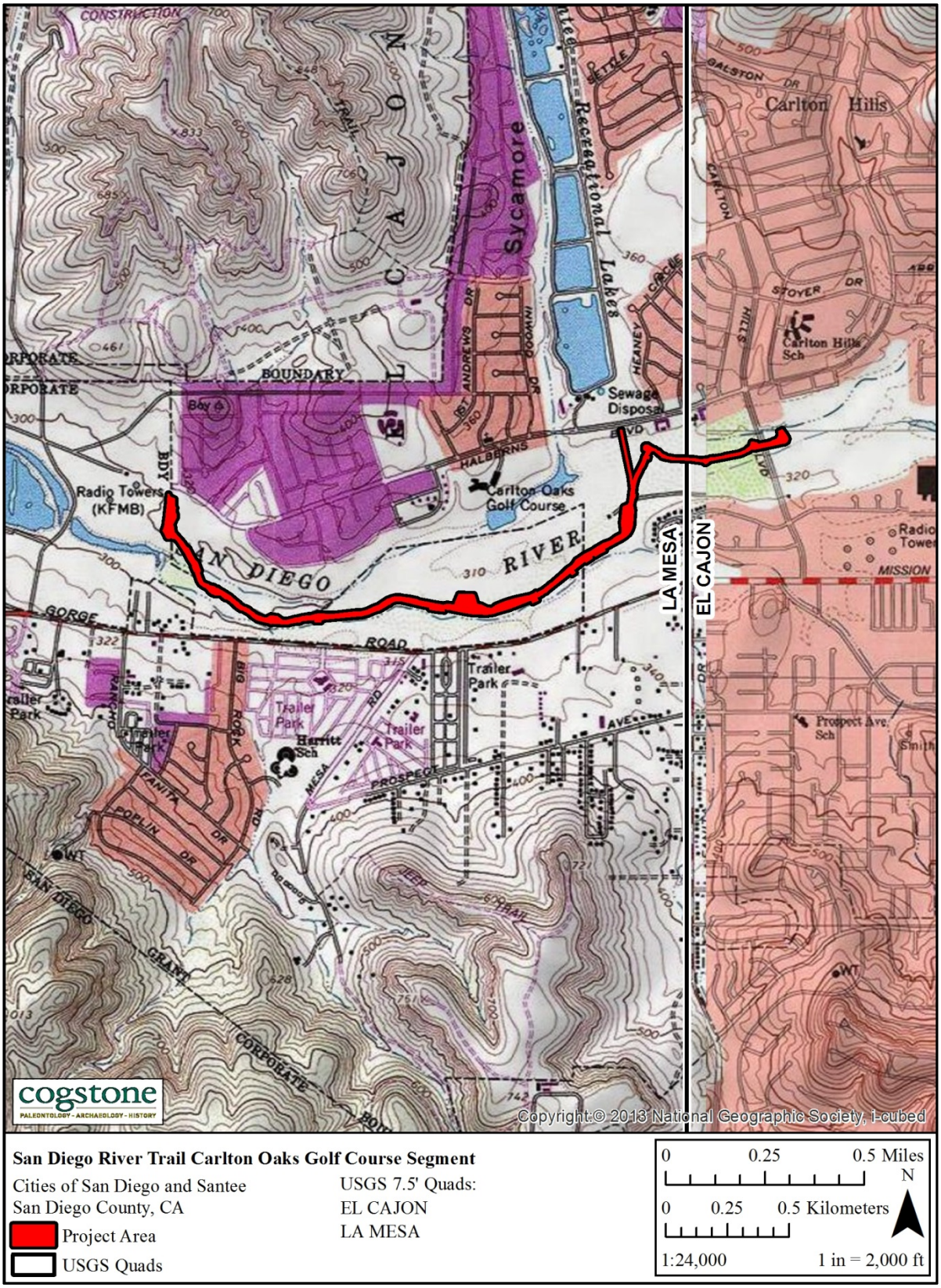

Figure 2. Project topography

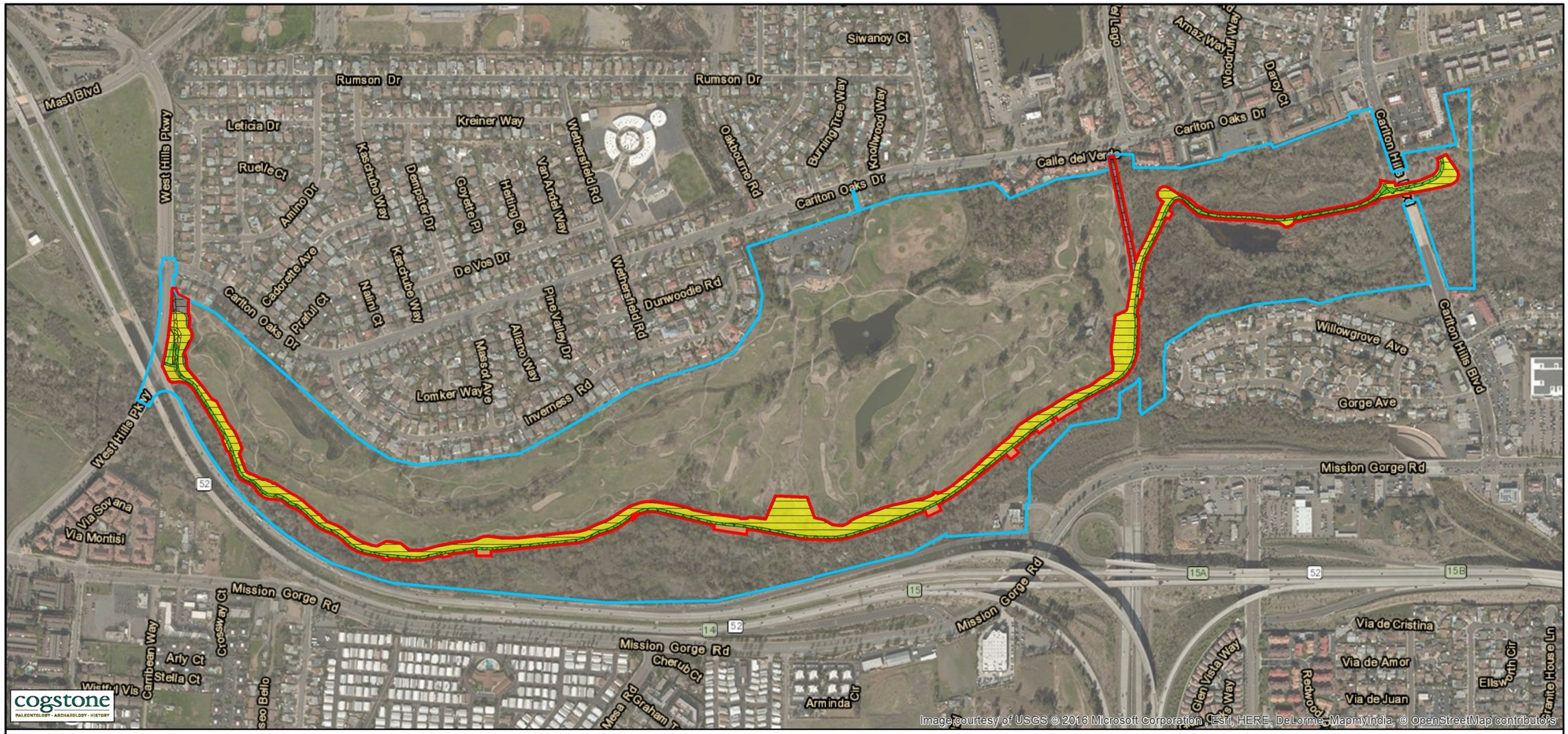

Figure 3. Project aerial

PROJECT PERSONNEL

Cogstone Resource Management Inc. (Cogstone) prepared this document.

- Sherri Gust was the Project Manager and reviewed this report for quality control. She is a City of San Diego Qualified Principal Paleontologist with a M.S. in Anatomy (Evolutionary Morphology) from the University of Southern California, a B.S. in Anthropology from the University of California, Davis and over thirty years of experience in California.
- Kim Scott wrote this report. She is a City of San Diego Qualified Principal Paleontologist with a M.S. in Biology with an emphasis in paleontology from California State University, San Bernardino, a B.S. in Geology with an emphasis in paleontology from the University of California, Los Angeles, and over 20 years of experience in California paleontology and geology.
- André Simmons prepared the geographic information system (GIS) maps throughout this report. Simmons has a M.A. in Anthropology from California State University Fullerton, a GIS certification, and over seven years of experience in California archaeology and paleontology.
- Michelle Courtney conducted the field survey. Courtney has a B.S. in Anthropology and is a certified City of San Diego archaeologist, cross-training in paleontology, and over 16 years of experience.

Qualifications of key project personnel are available in Appendix A.

REGULATORY ENVIRONMENT

STATE LAWS AND REGULATIONS

Paleontological resources are protected by state law as described below. This protection extends to all vertebrate fossils (animals with backbones) and any unique paleontological locality.

CALIFORNIA ENVIRONMENTAL QUALITY ACT (CEQA)

CEQA declares that it is state policy to: "take all action necessary to provide the people of this state with...historic environmental qualities." It further states that public or private projects financed or approved by the state are subject to environmental review by the state. All such projects, unless entitled to an exemption, may proceed only after this requirement has been satisfied. In the event that a project is determined to have a potential significant environmental effect, the act requires consideration of mitigation measures and alternatives to avoid or substantially lessen the significant effect. If paleontological resources are identified as being within the proposed project study area, the lead agency must take those resources into

consideration when evaluating project effects. The level of consideration may vary with the importance of the resource.

PUBLIC RESOURCES CODE RELATED TO PALEONTOLOGICAL RESOURCES

Section 5097.5: No person shall 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, or any other archaeological, paleontological or historical feature, situated on public lands (lands under state, county, city, district or public authority jurisdiction, or the jurisdiction of a public corporation), except with the express permission of the public agency having jurisdiction over such lands. Violation of this section is a misdemeanor. 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.

Section 30244: This section requires reasonable mitigation for impacts on paleontological resources that occur as a result of development on public lands.

Sections 4307-4309: Relating to the State Division of Beaches and Parks, afford protection to geologic features and "paleontological materials," but grant the director of the state park system authority to issue permits for specific activities that may result in damage to such resources, if the activities are for state park purposes and in the interest of the state park system

CALIFORNIA ADMINISTRATIVE CODE, TITLE 14, SECTION 4307

This section states that "No person shall remove, injure, deface or destroy any object of paleontological, archeological or historical interest or value."

PALEONTOLOGICAL RESOURCES CURATION CRITERIA

Only qualified, trained paleontologists with specific expertise in the type of fossils being evaluated can determine the importance of paleontological resources. Fossils are considered to be important if one or more of the following criteria apply:

1. The fossils provide information on the evolutionary relationships and developmental trends among organisms, living or extinct;
2. The fossils provide data useful for determining the age(s) of the rock unit or sedimentary stratum, including data important in determining the depositional history of the region and the timing of geologic events therein;
3. The fossils provide data regarding the development of biological communities or interaction between paleobotanical and paleozoological biotas;

4. The fossils demonstrate unusual or spectacular circumstances in the history of life;
5. The fossils are in short supply and/or in danger of being depleted or destroyed by the elements, vandalism, or commercial exploitation, and are not found in other geographic locations.

As so defined, important paleontological resources are determined to be fossils or assemblages of fossils that are unique, unusual, rare, uncommon, or diagnostically important. Important fossils can include remains of large to very small aquatic and terrestrial vertebrates or remains of plants and animals previously not represented in certain portions of the stratigraphy. Assemblages of fossils that might aid stratigraphic correlation, particularly those offering data for the interpretation of tectonic events, geomorphologic evolution, and paleoclimatology are also critically important (Scott and Springer 2003; Scott et al. 2004).

BACKGROUND

GEOLOGICAL SETTING

This project is located in the San Diego area of the Peninsular Ranges Geomorphic Province (Wagner 2002). The Peninsular Ranges are the result of the Pacific Plate and the North American Plate grinding past each other and forming north-south trending mountain ranges where the two plates collide along the San Andreas Fault Zone. The Peninsular Range Province extends from Mount San Jacinto in the north, to Baja California in the south.

The project is in the locally named Coastal Plain Region of the Peninsular Range Province. This region is bounded on the west by the Pacific Ocean and on the east by foothills of the Peninsular Ranges. Within the region, Mesozoic granitics are overlain by marine and nonmarine sedimentary units. Many of these sedimentary units are fossiliferous and record the diverse history of the area over the past 75 million years.

STRATIGRAPHY

The surface of the project is mapped as entirely as Holocene alluvium, which is less than less than 11,700 years old, adjacent to the San Diego River channel. Quaternary older alluvium and the late Eocene Friars Formation, which ranged from about 44 to 47 million years old, are present near to the project at the northwestern corner near Carlton Oaks Drive and West Hills Parkway (Kennedy and Peterson 1975, Tan and Kennedy 1996, Abbott 1999). However, although these formations are near to the project, wall footings in that area are expected to be a maximum of five feet below the original surface. Additionally these excavations are expected to

be entirely in artificial fill, so neither the Quaternary older alluvium nor the Friars Formation should be impacted (Todd 2004; Kennedy and Tan 2008).

ARTIFICIAL FILL

Modern artificial fill deposits are typically less than 200 year old in California and do not contain scientifically significant fossils if any are present (Todd 2004; Kennedy and Tan 2008).

HOLOCENE ALLUVIUM

Holocene deposits are too young to contain fossils. Deposited in stream beds and on alluvial flood plains, these poorly consolidated, permeable deposits consist of clasts ranging from pebble to clay (Todd 2004; Kennedy and Tan 2008).

RECORD SEARCHES

A record search of the project area and a one mile radius thereof was requested from the San Diego Natural History Museum (SDNHM; McComas 2016; Appendix B). Online records from the University of California Museum of Paleontology database (UCMP 2016), the Natural History Museum of Los County Department of Invertebrate Paleontology (LACMIP 2016), and the Paleobiology Database (PBDB 2016) were searched for fossil records as well as print sources (Jefferson 1991a, 1991b).

Terrestrial Pleistocene (Ice Age) fossils are typically found more than 10 feet deep in the Quaternary alluvial deposits (Holocene and Pleistocene) that cover most of the valley areas of California. Fossils of ground sloths (*Nothrotheriops shastensis*), mammoth (*Mammuthus* sp.), mastodons (*Mammut americanum*), bison (*Bison* sp.), camels (*Camelops hesternus*), tapirs (*Tapirus* sp. cf. *T. californicus*), horses (*Equus* sp.) have been found within the San Diego area (Jefferson 1991b). Tertiary fossils have been recovered from 13 sites in the Friars Formation located within half a mile of the project (McComas 2016).

The surface of the project is mapped as Holocene alluvium which is less than 11,700 old and is too young to contain fossils. No records of fossils from the Holocene alluvium were found from within the project boundaries or within a 1 mile radius thereof. Due to the minimal depths of the excavations, it is unlikely that either the potentially fossiliferous Quaternary older alluvium or the much older Friars Formation will be impacted.

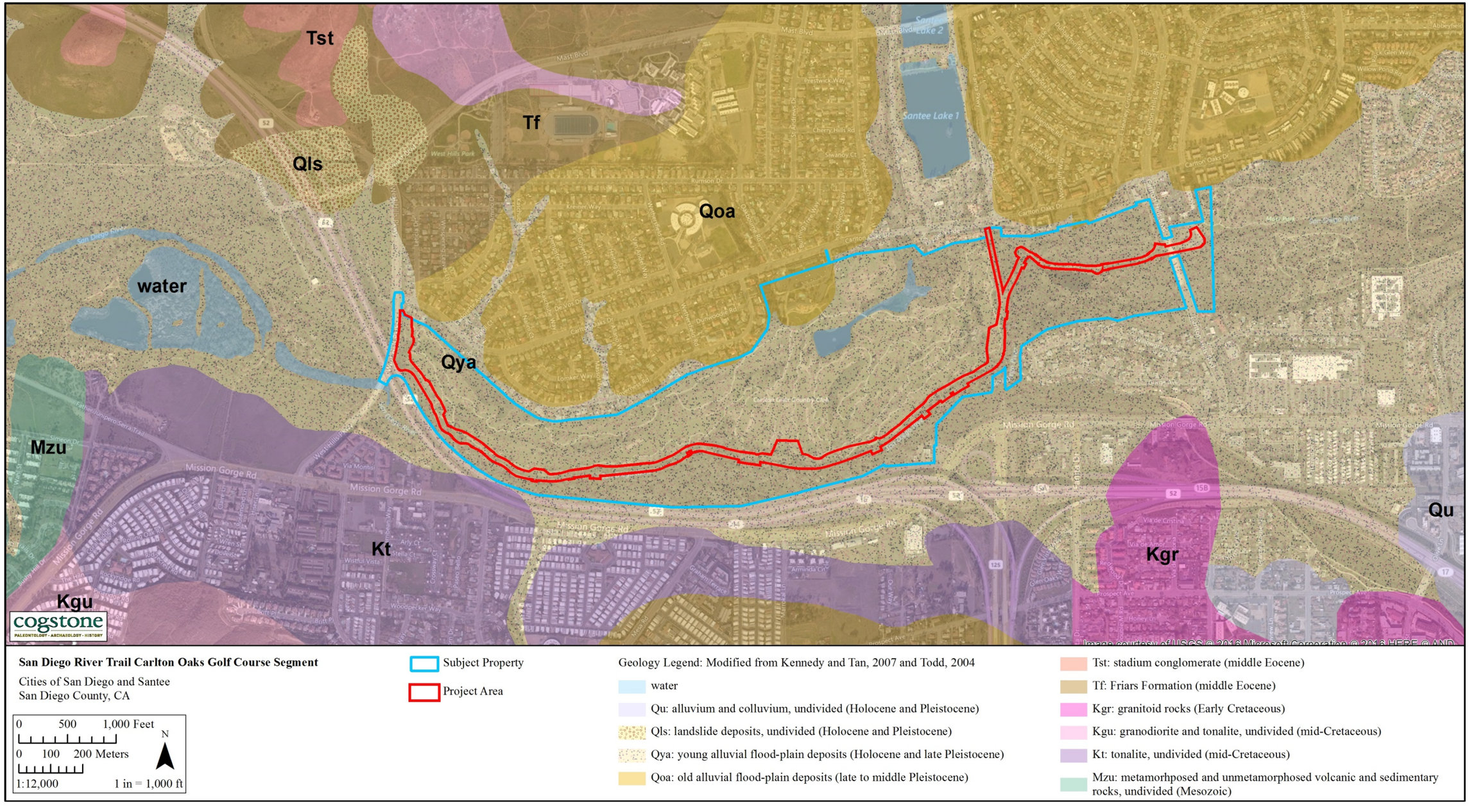

Figure 4. Geology of project area

SURVEY

METHODS

The paleontological resources survey of a project verifies the exact location of each previously identified paleontological resource and the potential for the sediments to contain fossil resources. Michelle Courtney, Cogstone staff archaeologist and cross-trained paleontologist, conducted an intensive-level pedestrian survey of the ground disturbance portion of the project area on November 22, 2016. The survey consisted of parallel transects while closely inspecting the ground surface. The survey was conducted in 15 meter wide transects across the entire project.

SURVEY RESULTS

Ground visibility in the undisturbed portion of the project was generally poor, owing to the presence of heavy vegetation adjacent to the river (Figure 5). Sediments observed consisted of sands to pebbles or small cobbles near the riverside (Figure 6). Soil around the river is a medium brown sandy soil mixed with greyish brown silty sand. Only recent river deposits and soils were observed and no fossils were encountered.

Figure 5. Overgrowth next to the San Diego River

Figure 6. Sediments adjacent to the San Diego River

PALEONTOLOGICAL SENSITIVITY

Occurrences of fossil resources are closely tied to their geologic source (e.g., formations or members that contain them). The probability for finding significant fossils in a project area can be broadly predicted from previous records of fossils recovered from the geologic units present in and/or adjacent to the study area.

A multilevel ranking system was developed by Bureau of Land Management (BLM) resource managers as a more practical tool, the Potential Fossil Yield Classification (PFYC) system (BLM 2007; Appendix C) which has a multi-level scale based on demonstrated yield of fossils.

Using the PFYC system, geologic units are classified as to the relative abundance of vertebrate fossils or scientifically significant invertebrate or plant fossils and their sensitivity to adverse impacts. This ranking is not intended to be applied to specific paleontological localities or small areas within units. Although significant localities may occasionally occur in a geologic unit, a few widely scattered important fossils or localities do not necessarily indicate a higher PFYC value; instead, the relative abundance of localities is intended to be the major determinant for the value assignment. Geological setting and fossil localities were considered in determining paleontological sensitivity according to PFYC criteria.

Additionally, sediments nearest to the basement rock where they are produced are typically coarsest; those farthest from the basement rock are finest. The chance of fossils being preserved greatly increases when sediments are fine (particle size of 5 mm across or less). Remains left on the ground are quickly weathered from the sun and destroyed, usually within 20 years or less depending on the environment. So the sands, silts, and clays of rivers, lakes, and oceans are most likely to contain fossils.

The project is mapped as Holocene alluvium adjacent to the modern San Diego River channel. Holocene sediments are given a low (PFYC 2) sensitivity. It is unlikely that either the Quaternary older alluvium or the Tertiary Friars Formation that are present near to the project at Carlton Oaks Drive will be impacted. Wall footings in that area are expected to be a maximum of five feet below the original surface and entirely in artificial fill. Artificial fill is given a very low (PFYC 1) sensitivity.

CONCLUSIONS AND RECOMMENDATIONS

Although Pleistocene deposits and the much older Friars Formation in San Diego County are fossiliferous, Holocene deposits and artificial fill do not contain the fossils of extinct animals. Additionally most of the project is to be graded to a depth of approximately 2.5 to 3 feet below surface with minor cuts for walls at the western end to approximately five feet deep which are entirely in artificial fill.

It is highly unlikely that fossils would be discovered based on the sediments present and the depth of planned excavations. If unanticipated discoveries are made all work must halt within 50 feet until a paleontologist can evaluate the find.

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APPENDIX A: QUALIFICATIONS

SHERRI GUST

Project Manager and Qualified Principal Paleontologist

EDUCATION

1994 M. S., Anatomy (Evolutionary Morphology), University of Southern California, Los Angeles
1979 B. S., Anthropology (Physical), University of California, Davis

SUMMARY QUALIFICATIONS

Gust has more than 35 years of experience in California, acknowledged credentials for meeting national standards, and is a certified/qualified principal paleontologist in all California cities and counties that maintain lists. She is a Member of the Society of Vertebrate Paleontology, Society for Economic Sedimentology and Paleontology, and others. Gust holds current statewide BLM paleontology permits in California and Nevada. She has special expertise in the identification and analysis of human, animal and fossil bone.

SELECTED PROJECTS

San Diego River Bridge Double Track Project, San Diego Associate of Governments, San Diego County, CA. The project is an approximate one-mile segment of second main track (double tracking) and a bridge replacement with associated track and signal improvements. Prepared a Paleontological Assessment Report. Sub to Simon Wong Engineering. Project Manager and Principal Paleontologist. 2013-present.

Purple Line Extension (Westside Subway) Construction Management, Segment 1, Metropolitan Transportation Authority, Los Angeles County, CA. The project involves construction of nine stations from the existing Purple Line at Wilshire/Western Avenue along Wilshire Boulevard to the Veterans Administration Hospital in Westwood for 8.6 miles. Federal Transit Authority (FTA) is the lead agency for the project. Personally directed and performed paleontological monitoring, fossil recovery, fossil preparation and co-authored monitoring compliance report for a 75 ft. deep exploratory shaft a block from the La Brea Tar pits. Currently Field Director and Co-Principal Investigator for paleontological monitoring of construction. Member of Westside Extension Support Team. Principal Investigator. 2014-present.

Elvira to Morena Double Track, San Diego Associate of Governments, San Diego County, CA. The project is construction a second main track and realignment of a 10.3 mile stretch of double track, new bridges, retaining walls and extension or replacement of existing culverts under the railroad. Performed paleontological survey and authored Paleontological Resources Assessment. Currently directing monitoring of for fossil resources. Sub to HDR Engineering. Project Manager and Principal Paleontologist. 2012-present.

State Route 94 Improvement Project, between Jamacha and Jamul, Caltrans District 11, San Diego County, CA. The project was improvement of six intersections. Personally conducted paleontological survey and prepared a combined Paleontological Identification Report and Paleontological Evaluation Report (PIR/PER). Sub to Environmental Data Systems. Project Manager and Principal Paleontologist. 2013.

Geospatial Paleontology Database, Caltrans District 6, 9, and 10. Managed fossil geodatabase development. Developed GIS maps with linked database for 15 counties in central California for all paved roadways. Obtained and/or digitized geological maps, performed research on geological formations and fossil localities sufficient to assign Potential Fossil Yield Classification rankings to all rock units, developed PFYC layer, mapped fossil localities, developed map pop-ups with information at the cursor, and prepared metadata. Sub to URS Corporation. Project Manager and Principal Paleontologist. 2011-2011

Coronado Transbay Project Sewer Pipeline, City of Coronado, San Diego County, CA. Project was construction of an underwater sewer main between the City of San Diego and the Coronado Peninsula. A paleontological assessment report was prepared. Sub to Parsons Brinckerhoff. Project Manager and Principal Paleontologist. 2006.

KIM SCOTT
Qualified Principal Paleontologist

EDUCATION

2000 B.S., Geology with paleontology emphasis, University of California, Los Angeles
2013 M.S., Biology with a paleontology emphasis, California State University, San Bernardino

SUMMARY QUALIFICATIONS

Scott has more than 20 years of experience in California paleontology and geology. She is a qualified geologist and field paleontologist with extensive survey, monitoring and fossil salvage experience. In addition, she has special skills in fossil preparation (cleaning and stabilization) and preparation of stratigraphic sections and other documentation for fossil localities. Scott serves as company safety officer and is the author of the company safety and paleontology manuals.

SELECTED PROJECTS

Batiquitos Lagoon Double Track, San Diego Associate of Governments (SANDAG), Leucadia, Encinitas, Carlsbad, San Diego County, CA. Authored a Cultural Resources Report that documented the sensitivity assessment, field survey, background research, and records search. Paleo compliance to support the environmental constraints analysis, alternatives analysis and a preferred alternative evaluation for the preliminary engineering and environmental phase of the project. SANDAG plans to construct a 2.7-mile-long segment of double-track, grade crossing modifications, site improvements (drainage, culverts, utilities), signal modifications and a bridge crossing at Batiquitos Lagoon. Co-Principal Paleontologist/Report Co-author. 2016.

Purple Line Extension (Westside Subway) Construction Management, Segment 1, Metropolitan Transportation Authority, Los Angeles County, CA. The project involves construction of nine stations from the existing Purple Line at Wilshire/Western Avenue along Wilshire Boulevard to the Veterans Administration Hospital in Westwood for 8.6 miles. Federal Transit Authority (FTA) is the lead agency for the project. Personally directed and performed paleontological monitoring, fossil recovery, fossil preparation and co-authored monitoring compliance report for a 75 ft. deep exploratory shaft a block from the La Brea Tar pits. Currently Field Director and Co-Principal Investigator for paleontological monitoring of construction. Member of Westside Extension Support Team. Field and Lab Director/ Co-Principal Investigator/Report Co-author. 2014-present.

Elvira to Morena Double Track, San Diego Associate of Governments, San Diego County, CA. The project is construction a second main track and realignment of a 10.3 mile stretch of double track, new bridges, retaining walls and extension or replacement of existing culverts under the railroad. Performed paleontological survey and authored Paleontological Resources Assessment. Currently directing monitoring of for fossil resources. Sub to HDR Engineering. Co-Principal Paleontologist/Report Co-author. 2012-present.

State Route 94 Improvement Project, between Jamacha and Jamul, Caltrans District 11, San Diego County, CA. The project was improvement of six intersections. Personally conducted paleontological survey and prepared a combined Paleontological Identification Report and Paleontological Evaluation Report (PIR/PER). Sub to Environmental Data Systems. Field and Lab Director/Report Co-author. 2013.

Geospatial Paleontology Database, Caltrans District 6, 9, and 10. Conducted paleontological research for 15 counties in central and eastern California for paleontological screening tool. Paleontology Researcher. 2011-2012

North Park, Redevelopment Agency of the City of San Diego, CA. The project was a specific plan assessment of approximately 557 acres of the City of San Diego. Contributed to the Paleontological Assessment report. Sub to RBF Consulting. Field and Lab Director/Report Co-author. 2010.

ANDRÉ-JUSTIN C. SIMMONS
Principal Archaeologist & GIS Supervisor

EDUCATION

2014 M.A., Anthropology: Specializing in Anthropological Archaeology, California State University, Fullerton
2010 B.A., Anthropology and History, California State University, Fullerton, graduated *cum laude*
2012 Certificate in Geographic Information Systems, California State University, Fullerton

SUMMARY QUALIFICATIONS

Mr. Simmons is a qualified archaeologist and cross-trained paleontologist with extensive field experience in survey, monitoring, faunal analysis, and excavation. He exceeds the qualifications required by the Secretary of the Interior's *Standards and Guidelines for Archaeology and Historic Preservation*. Further, he is certified in Geographic Information Systems (GIS) and specializes in ESRI's ArcGIS software. Mr. Simmons is responsible for supervising GIS data collection and management, geospatial analysis, and the production of GIS maps and databases for large and small-scale projects. His key research interests include settlement patterns and use of space among Paleoindians, the American Southwest, early historic and prehistoric California, and historical Mexico. He has over six years of experience in California Archaeology and paleontological monitoring along with more than 24 hours of paleontology training and over four years of GIS experience.

SELECTED PROJECTS

Batiquitos Lagoon Double Track, San Diego Associate of Governments (SANDAG), Leucadia, Encinitas, Carlsbad, San Diego County, CA. Authored a Cultural Resources Report that documented the sensitivity assessment, field survey, background research, and records search. Prepared geological maps. NEPA and NHPA Section 106 compliance to support the environmental constraints analysis, alternatives analysis and a preferred alternative evaluation for the preliminary engineering and environmental phase of the project. SANDAG plans to construct a 2.7-mile-long segment of double-track, grade crossing modifications, site improvements (drainage, culverts, utilities), signal modifications and a bridge crossing at Batiquitos Lagoon. Sub to Helix/HNTB. Principal Archaeologist/GIS Manager. 2016

San Diego River Bridge Double Track, San Diego Associate of Governments (SANDAG), San Diego County, CA. Authored Cultural Resources Technical Report and prepared GIS maps to support a cultural resources survey. The project involves construction of a new double track bridge across the San Diego River and the alignment of the track to each side of the bridge along a 1.1-mile long segment of the LOSSAN railroad corridor. Sub to HDR Engineering. Archaeologist/GIS Technician. 2013-2014

Rose Creek Bike Trail, San Diego Associate of Governments (SANDAG), San Diego County, CA. Conducted record search, Sacred Land search, NAHC consultation and GIS mapping to support a cultural resources constraints analysis; Archaeological Survey Report (ASR), Historic Property Survey Report (HPSR) and Historic Resources Evaluation Report (HRER). The trail is adjacent to I-5 and within proximity to the Mid-Coastal Light Rail APE. Sub to Nasland Engineering. Archaeologist/GIS Technician. 2012-2014

Elvira to Moreno Double Track, San Diego Associate of Governments (SANDAG), San Diego County, CA. Prepared GIS maps in support of a Paleontological Assessment for the project. SANDAG plans to construct a second main track and realignment from CP Elvira in La Jolla to CP Morena near Mission Bay. The project would result in a 10.3 mile stretch of double track, new bridges, retaining walls and extension or replacement of existing culverts under the railroad. Sub to HDR Engineering. GIS Technician. 2013

APPENDIX B: PALEONTOLOGICAL RECORDS SEARCH

SAN DIEGO NATURAL HISTORY MUSEUM
BALBOA PARK - SAN DIEGO SOCIETY OF NATURAL HISTORY - ESTABLISHED 1874

26 October 2016

Ms. Megan Wilson
Cogstone
1518 W. Taft Ave.
Orange, CA 92865

RE: Paleontological Record Search – Carlton Oaks Golf Course Segment Project (Project Number 3777)

Dear Ms. Wilson:

This letter presents the results of a paleontological record search conducted for the Carlton Oaks Golf Course Segment project, located in the east central portion of the City of San Diego and the western portion of the City of Santee, San Diego County, CA (Appendix 1). The project area is bounded to the west by West Hills Parkway, to the south by the Mount Soledad Freeway (California State Route 52), residential development and undeveloped land, to the east by undeveloped land east of Carlton Hills Boulevard that is owned by the City of Santee, and to the north by residential and commercial development.

A review of published geological maps covering the project area was conducted to determine the specific rock units underlying the site. Each unit was subsequently assigned a paleontological resource sensitivity following the City of San Diego and County of San Diego Guidelines (Deméré and Walsh, 1993; City of San Diego, 2011). Published geological reports (e.g., Kennedy and Peterson, 1975; Kennedy and Tan, 2008; Todd, 2004) that cover the project area reveal that it is underlain by Holocene to late Pleistocene-age young alluvial flood plain deposits and late to middle Pleistocene-age old alluvial flood plain deposits. Both of these rock units and their paleontological sensitivities are summarized in detail in the following section.

In addition, a search of the paleontological records at the San Diego Natural History Museum (SDNHM) was conducted in order to determine if any documented fossil collection localities occur within the project area or in the immediate surrounding area. The SDNHM has thirteen recorded fossil localities within a 1-mile radius of the project area (Appendix 2). All thirteen localities are from the middle Eocene-age Friars Formation, which is not anticipated to be impacted by construction.

GEOLOGICAL ROCK UNITS UNDERLYING THE PROJECT:

LATER QUATERNARY ALLUVIAL DEPOSITS – Holocene and late Pleistocene alluvial deposits (mapped by Kennedy and Tan, 2008, and Todd, 2004, as Qya) occur in modern floodplains along the San Diego River. The SDNHM does not have any fossil localities from these deposits within a 1-mile radius of the project area. These deposits are generally less than 10,000 years old, and are assigned a low paleontological sensitivity based on their young

geologic age and the lack of known fossil localities; however, these deposits may overlie sensitive units that could be impacted where the contact is relatively shallow.

PLEISTOCENE OLD ALLUVIAL FLOOD PLAIN DEPOSITS – Late to middle Pleistocene-age (approximately 10,000 years to 2.6 million years old) old alluvial flood plain deposits (mapped by Kennedy and Tan, 2008, and Todd, 2004, as Qoa) underlie the project area along the north side of the San Diego River. The SDNHM does not have any fossil localities from these deposits within a 1-mile radius of the project area; however, fossils are known from these deposits elsewhere in western San Diego County. Recovered fossils include scientifically significant terrestrial vertebrate fossils (e.g., reptiles, birds, small mammals, and large-bodied "Ice-Age" mammals such as mammoth, bison, horse, and camel) (Deméré and Walsh, 1993). Therefore, these deposits are assigned a high paleontological sensitivity.

SUMMARY AND RECOMMENDATIONS:

Given the high paleontological sensitivity of Pleistocene old alluvial flood plain deposits in San Diego County (Deméré and Walsh, 1993; City of San Diego, 2011), as well as the known SDNHM fossil localities in close proximity to the project site, any proposed excavation activities that extend deep enough to encounter previously undisturbed deposits of this unit have the potential to impact paleontological resources. For these reasons, implementation of a complete paleontological resource mitigation program during ground-disturbing activities is recommended.

The information contained within this paleontological record search should be considered private and is the sole property of the San Diego Natural History Museum. Any use or reprocessing of information contained within this document beyond the scope of the Carlton Oaks Golf Course Segment project is prohibited.

If you have any questions concerning these findings please feel free to contact me at 619-255-0321 or kmccomas@sdnhm.org.

Sincerely,

Katie McComas
Paleontology Collections Assistant
Department of Paleontology

Literature Cited:

City of San Diego. 2011. California Environmental Quality Act, Significance Determination Thresholds. Development Services Department, 84 p.

Deméré, T.A. and Walsh, S.L. 1993. Paleontological Resources, County of San Diego. Prepared for the San Diego Planning Commission: 1-68.

Kennedy, M.P., and Peterson, G.L. 1975. Geology of the San Diego metropolitan area, California. Section B - Eastern San Diego metropolitan area. California Division of Mines and Geology, Bulletin 200: 43–56.

Kennedy, M.P., and Tan, S.S. 2008. Geologic Map of the San Diego 30' x 60' Quadrangle, California. California Geological Survey, Regional Geologic Map Series 1:100,000 scale, map no. 3.

Todd, V.R. 2004. Preliminary Geologic Map of the El Cajon 30' x 60' Quadrangle, Southern California. U.S. Geological Survey, Open-File Report 2004-1361.

Note: Parts of this letter were not included as they had confidential information with no bearing on the project.

APPENDIX C: SENSITIVITY RANKING CRITERIA

PFYC Description (BLM, 2008)	**PFYC Rank**
Very Low. The occurrence of significant fossils is non-existent or extremely rare. Includes igneous or metamorphic and Precambrian or older rocks. Assessment or mitigation of paleontological resources is usually unnecessary.	1
Low. Sedimentary geologic units that are not likely to contain vertebrate fossils or scientifically significant nonvertebrate fossils. Includes rock units too young to produce fossils, sediments with significant physical and chemical changes (e.g., diagenetic alteration) and having few to no fossils known. Assessment or mitigation of paleontological resources is not likely to be necessary.	2
Potentially Moderate but Undemonstrated Potential. Units exhibit geologic features and preservational conditions that suggest fossils could be present, but no vertebrate fossils or only common types of plant and invertebrate fossils are known. Surface-disturbing activities may require field assessment to determine appropriate course of action.	3b
Moderate Potential. Units are known to contain vertebrate fossils or scientifically significant nonvertebrate fossils, but these occurrences are widely scattered and of low abundance. Common invertebrate or plant fossils may be found. Surface-disturbing activities may require field assessment to determine appropriate course of action.	3a
High. Geologic units containing a high occurrence of significant fossils. Fossils must be abundant per locality. Vertebrate fossils or scientifically significant invertebrate or plant fossils are known to occur and have been documented, but may vary in occurrence and predictability. If impacts to significant fossils can be anticipated, on-the-ground surveys prior to authorizing the surface disturbing action would usually be necessary. On-site monitoring or spot-checking may be necessary during construction activities.	4
Very High. Highly fossiliferous geologic units that consistently and predictably produce vertebrate fossils or scientifically significant invertebrate or plant fossils. Vertebrate fossils or scientifically significant invertebrate fossils are known or can reasonably be expected to occur in the impacted area. On-the-ground surveys prior to authorizing any surface disturbing activities would usually be necessary. On-site monitoring may be necessary during construction activities.	5