
Appendix O

Paleontological Resources Inventory Report

February 17, 2022

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City of San MarcosSaima Qureshy, Principal Planner
1 Civic Center Drive
San Marcos, California 92069**Subject: Paleontological Resources Inventory Report for the Pacific GPA/Rezone Project, City of San Marcos, San Diego County, California****Dear Ms Saima Qureshy:**

This letter documents the results of the paleontological resources inventory conducted by Dudek for the proposed Pacific GPA/Rezone Project (project) located in the City of San Marcos, San Diego County, California (Figure 1 – Project Location Map) (Figures provided at the end this memorandum). The City of San Marcos (City) is the Lead Agency for compliance with the California Environmental Quality Act (CEQA). This report was prepared by Dudek paleontologists, Michael Williams, Ph.D. and Sarah Siren, M.Sc., who meet the Secretary of the Interior's Standards for archaeology.

To determine the paleontological sensitivity of the project site, Dudek performed a paleontological resources inventory and preconstruction survey for the project to comply with the California Environmental Quality Act (CEQA) and County of San Diego's Guidelines. The inventory consisted of a Natural History Museum of San Diego (SDNHM) paleontological records search and a review of geological mapping and geological and paleontological literature. The results of the paleontological records search were negative for paleontological resources within the project site; however, the SDNHM reported four fossil localities within a one-mile radius of the project site, from geological units that do not underly the project site.

1 Project Description and Location

The 33.2-acre project site is an infill site located in the western portion of the City of San Marcos (City), at the northwest corner of S. Las Posas Road and Linda Vista Drive, comprised of Assessor's Parcel Numbers 219-222-01, 219-222-02, 219-222-03, and 219-222-04. La Mirada Drive abuts the site's northern boundary, while South Pacific Street abuts the property's western boundary. The Grand Plaza shopping center is located directly across Las Posas Road to the east. Light industrial uses are adjacent to the site's northern, southern, and western boundary, and Bradley Park is located across from the site's southwestern corner. Single- and multi-family residential uses are located to the west and south of Bradley Park. The property is mapped on Section 16 of Township 12 South, Range 3 West on the United States Geological Survey (USGS) 7.5' San Marcos Quadrangle (USGS 2022).

The project consists of 449 residential units, including a mix of apartments, rowhomes, villas, and affordable flats on approximately 15.09 acres of the 33.2-acre project site. Proposed residential units would include a mix of apartments within a five-story podium building, three-story rowhomes, three-story villas, and affordable flats within a four-story building. The project includes a total of 927 parking spaces and 134,985 square feet of common open space area. 68 of the 449 total units (15% of the total) would be designated as deed-restricted affordable units (alternatively, the project reserves the option to contribute to the affordable housing fund by paying the in-lieu fee). The proposed project also includes landscaping, bio-retention areas, and circulation improvements. The remaining approximately 17.94 acres of the 33.2-acre project site would be preserved and restored as open space and habitat area. The proposed project would have a density of approximately 13.5 dwelling units per acre, including the open space and habitat area.

The project proposes a General Plan Amendment, Rezone, Specific Plan, Tentative Map, and Multi-Family Site Development Plan. The General Plan Amendment and Rezone would change the General Plan designation and Zoning from Industrial (I) to Specific Plan Area (SPA). The Specific Plan has been prepared with the intent to provide a comprehensive plan to ensure the efficient development of a new residential community. The Specific Plan serves as both a policy document and a regulatory document for the systematic implementation of the policies and goals of the General Plan. The Tentative Map presents specific lot configurations for the site. The Multi-Family Site Development Plan will configure the site for multi family dwelling units, street configuration, infrastructure, recreational open space, and private open space.

As part of the project, additional pedestrian connectivity would be provided along three of the adjacent street frontages. The project would provide a 6-foot sidewalk and Class II buffered bike lane along the project's frontage on Pacific Street; the project would provide a 12-foot urban trail (shared use path) along the project's frontage on Linda Vista Drive; and the project would also provide a 12-foot urban trail (shared use path) along the project's frontage on La Mirada Drive. In addition to the proposed sidewalk and trail connections, the project would add a bus stop and shelter with a bus turnout along South Las Posas Road adjacent to the development area and would install a 4-way traffic signal at the intersection of Linda Vista Drive and Pacific Street. Furthermore, the project would upsize approximately 1,458-feet of existing water pipe from 8-inches to 12-inches and would convert approximately 1,400-feet of existing overhead power lines to underground along La Mirada.

2 Paleontological Resources

Paleontological resources are the remains or traces of plants and animals that are preserved in the Earth's crust, and per the Society of Vertebrate Paleontology ([SVP] 2010) guidelines, are older than written history or older than approximately 5,500 years. They are limited, nonrenewable resources of scientific and educational value and are afforded protection under State laws and regulations. This study satisfies requirements in accordance with State guidelines (13 California Public Resources Code 21000 et seq.) and California Public Resources Code Section 5097.5 (Stats 1965, c 1136, p. 2792). This analysis also complies with guidelines and significance criteria specified by SVP (2010) and the County of San Diego (2009). Table 1 provides definitions for high, moderate, low, marginal, and no paleontological resource potential, or sensitivity, as set forth in and by the County of San Diego's (2009) Guidelines for Determining Significance: Paleontological Resources.

Table 1. Paleontological Resources Sensitivity Criteria

Resource Sensitivity/Potential	Definition
High	High resource potential and high sensitivity are assigned to geologic formations known to contain paleontological localities with rare, well preserved, critical fossil materials for stratigraphic or paleoenvironmental interpretation, and fossils providing important information about the paleoclimatic, paleobiological and/or evolutionary history (phylogeny) of animal and plant groups. In general, formations with high resource potential are considered to have the highest potential to produce unique invertebrate fossil assemblages or unique vertebrate fossil remains and are, therefore, highly sensitive.
Moderate	Moderate resource potential and moderate sensitivity are assigned to geologic formations known to contain paleontological localities. These geologic formations are judged to have a strong, but often unproven, potential for producing unique fossil remains (Deméré and Walsh 1993).
Low	Low resource potential and low sensitivity are assigned to geologic formations that, based on their relatively young age and/or high-energy depositional history, are judged unlikely to produce unique fossil remains. Low resource potential formations rarely produce fossil remains of scientific significance and are considered to have low sensitivity. However, when fossils are found in these formations, they are often very significant additions to our geologic understanding of the area.
Marginal	Marginal resource potential and marginal sensitivity are assigned to geologic formations that are composed either of volcanoclastic (derived from volcanic sources) or metasedimentary rocks, but that nevertheless have a limited probability for producing fossils from certain formations at localized outcrops. Volcanoclastic rock can contain organisms that were fossilized by being covered by ash, dust, mud, or other debris from volcanoes. Sedimentary rocks that have been metamorphosed by heat and/or pressure caused by volcanoes or plutons are called metasedimentary. If the sedimentary rocks had paleontological resources within them, those resources may have survived the metamorphism and still be identifiable within the metasedimentary rock, but since the probability of this occurring is so limited, these formations are considered marginally sensitive.
No Sensitivity	No resource potential is assigned to geologic formations that are composed entirely of volcanic or plutonic igneous rock, such as basalt or granite, and therefore do not have any potential for producing fossil remains. These formations have no paleontological resource potential, i.e., they are not sensitive.

Source: County of San Diego 2009.

3 Regulatory Framework

3.1 California Environmental Quality Act

The CEQA Guidelines require that all private and public activities not specifically exempted be evaluated against the potential for environmental damage, including effects to paleontological resources. Paleontological resources, which are limited, nonrenewable resources of scientific, cultural, and educational value, are recognized as part of the environment under these state guidelines. This study satisfies project requirements in accordance with CEQA (13 PRC [Public Resources Code], 21000 et seq.).

Paleontological resources are explicitly afforded protection by CEQA, specifically in Section VII(f) of CEQA Guidelines Appendix G, the “Environmental Checklist Form,” which addresses the potential for adverse impacts to “unique paleontological resource[s] or site[s] or ... unique geological feature[s].” This provision covers fossils of signal importance – remains of species or genera new to science, for example, or fossils exhibiting features not previously recognized for a given animal group – as well as localities that yield fossils significant in their abundance, diversity, preservation, and so forth.

3.2 PRC Section 5097.5

The PRC Section 5097.5 (Stats 1965, c 1136, p. 2792) regulates removal of paleontological resources from state lands, defines unauthorized removal of fossil resources as a misdemeanor, and requires mitigation of disturbed sites.

4 Methods

4.1 Geological Map Review, Literature Review, and Paleontological Records Search

Published geological maps and published and unpublished reports were reviewed to identify geological units on the site and determine their paleontological sensitivity.

A paleontological records search request was sent to the SDNHM on December 9, 2022. The purpose of the records search is to determine whether there are any known fossil localities in or near the project site to aid in determining whether a paleontological mitigation program is warranted to avoid or minimize potential adverse effects of construction on paleontological resources.

5 Results

5.1 Geological Map Review, Literature Review, and Paleontological Records Search

The project site lies within the Peninsular Ranges Geomorphic Province (California Geological Survey 2002). This province extends from the tip of the Baja California Peninsula to the Transverse Ranges (the San Gabriel and San Bernardino Mountains) and includes the Los Angeles Basin, offshore islands (Santa Catalina, Santa Barbara, San Nicholas, and San Clemente), and the continental shelf. The eastern boundary is the Colorado Desert Geomorphic Province (California Geological Survey 2002; Morton and Miller 2006). The ancestral Peninsular Ranges were formed by uplift of plutonic igneous rock resulting from the subduction of the Farallon Plate underneath the North American Plate during the latter portion of the Mesozoic era (approximately 125 to 90 million years ago [mya]) (Abbott 1999).

According to the published geological mapping at a scale of 1:100,000 by Kennedy et al. (2007), the SDNHM records search results, geotechnical borings conducted for the project (GeoTek, Inc. 2022), and the international chronostratigraphic chart (Cohen et al. 2022), the majority of project site is underlain by middle Eocene-age (approximately 49 mya to 40 mya) Eocene deposits (the Santiago Formation - map unit Ts) (Figure 2 – Geological Map). Holocene (< 11,700 years ago) alluvial flood plain deposits (map unit Qy), likely derived from San Marcos Creek to the south, underlie the eastern side of the project site (Figure 2 – Geological Map).

The Santiago Formation, formerly the Tejon Formation (English and Prutzman 1926), was first described and named by Woodring and Popenoe (1945) based on the type section located in the Santa Ana Mountains of Orange County. The formation consists of sparsely fossiliferous marine siltstones and sandstones; however, the upper Santiago Formation is likely non-marine due to the presence of petrified wood (Schoellhamer et al. 1981). As discussed in Mihalbachler and Deméré (2009, 2010), the Santiago Formation was divided into three distinct units. The basal unit (Member A) consists of coarse-grained arkosic sandstone that is generally not bedded; the middle unit (Member B) consists of medium-grained arkosic sandstone; and the upper unit (Member C) consists of coarse-grained arkosic sandstone and grit (Kennedy et al. 2007; Mihalbachler and Deméré 2009, 2010). The type section and exposures in northern San Diego County include marine and nonmarine, mudstone, siltstone and sandstone beds, being differentiated by their depositional environment and fossil content. The lower member (Member A) and middle member (Member B) are marine deposits, whereas the upper member (Member C) is non-marine in origin (Mihalbachler and Deméré 2010).

While Holocene alluvial deposits are generally too young to yield significant paleontological resources, Santiago Formation deposits are known to produce significant marine and terrestrial fossil plant remains, invertebrates, and vertebrates (e.g., plant remains, mollusks, fishes, reptiles, and small and large mammals) in northern San Diego County (Deméré and Walsh 1993). Given the close proximity of the Santiago Formation to the mapped Holocene alluvial floodplain deposits, it likely underlies the Holocene alluvial deposits at a relatively shallow depth. The Holocene alluvial floodplain deposits have low paleontological sensitivity that increases with depth where they potentially are old enough to produce significant fossils or are underlain by the Santiago Formation, which has high paleontological sensitivity throughout its stratigraphic extent.

The SDNHM records search results letter was received on December 20, 2022. No records of fossil localities were found within the boundaries of the project site; however, the SDNHM reported four fossil localities within a 1-mile radius of the project (Confidential Attachment A). All four localities (6880, 6881, 6882, 6883) are from the Santiago Formation, which is found within the project site on the surface and at depth, and included trace fossils (burrows), woody plants, marine invertebrates (e.g., bryozoans, clams, mussels, oysters, snails, and sea urchins), and marine bony fish fossils (Confidential Attachment A).

5 Summary and Management Recommendations

No paleontological resources were identified within the project site as a result of the institutional records search and desktop geological and paleontological review. The paleontological records search conducted by the SDNHM revealed four nearby localities, all of which are from the same geological unit that underlies the project site on the surface or at depth (the Santiago Formation). Eocene deposits mapped within and throughout most of the project site have high paleontological sensitivity; Holocene alluvial deposits have low paleontological sensitivity on the surface, increasing with depth; and artificial fill, if present, has no paleontological sensitivity. Based on the records search results and map and literature review, the project site has high potential to produce paleontological resources during planned construction activities in areas underlain by Eocene deposits and Holocene deposits at depth. In the event that intact paleontological resources are discovered on the project site, ground-disturbing activities associated with construction of the project, such as grading and augering during site preparation and trenching for utilities, have the potential to destroy a unique paleontological resource or site. Without mitigation, the potential damage to paleontological resources during construction would be a potentially significant impact. With implementation of the following recommended mitigation measure (MM), impacts would be reduced to below a level of significance. Impacts of the project are considered less than significant with mitigation incorporated during construction.

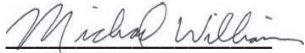
MM GEO-1: Paleontological Resources Impact Mitigation Program and Paleontological Monitoring. Prior to commencement of any grading activity on site, the applicant shall retain a qualified paleontologist per the Society of Vertebrate Paleontology (2010) guidelines. The qualified paleontologist shall prepare a Paleontological Resources Impact Mitigation Program (PRIMP) for the project that shall be consistent with the SVP (2010) guidelines and outline requirements for preconstruction meeting attendance and worker environmental awareness training, where paleontological monitoring is required within the project site based on construction plans and/or geotechnical reports, procedures for adequate paleontological monitoring and discoveries treatment, and paleontological methods (including sediment sampling for microinvertebrate and microvertebrate fossils), reporting, and collections management. The PRIMP shall also include a statement that any fossil lab or curation costs (if necessary due to fossil recovery) are the responsibility of the project proponent. A qualified paleontological monitor shall be on site during initial rough grading and other significant ground-disturbing activities (including augering) in areas underlain by the Santiago Formation and below a depth of five feet below the ground surface in areas underlain by Holocene alluvium to determine if they are old enough to preserve scientifically significant paleontological resources. In the event that paleontological resources (e.g., fossils) are unearthed during grading, the paleontological monitor will temporarily halt and/or divert grading activity to allow recovery of paleontological resources. The area of discovery will be roped off with a 50-foot radius buffer. Once

TO: SAIMA QURESHY
SUBJECT: PALEONTOLOGICAL RESOURCES INVENTORY REPORT FOR THE PACIFIC GPA/REZONE PROJECT, CITY OF
SAN MARCOS, SAN DIEGO COUNTY, CALIFORNIA

documentation and collection of the find is completed, the monitor will allow grading to recommence in the area of the find.

Should you have any questions relating to this report and its findings please contact Michael Williams (mwilliams@dudek.com) or Sarah Siren (ssiren@dudek.com).

Respectfully Submitted,



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Paleontologist
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Att.: *Figure 1, Regional Location Map*
Figure 2, Geological Map
Attachment A, Confidential LACM Paleontological Records Search Results

cc: *Vanessa Scheidel, Dudek*
Sarah Siren, Dudek

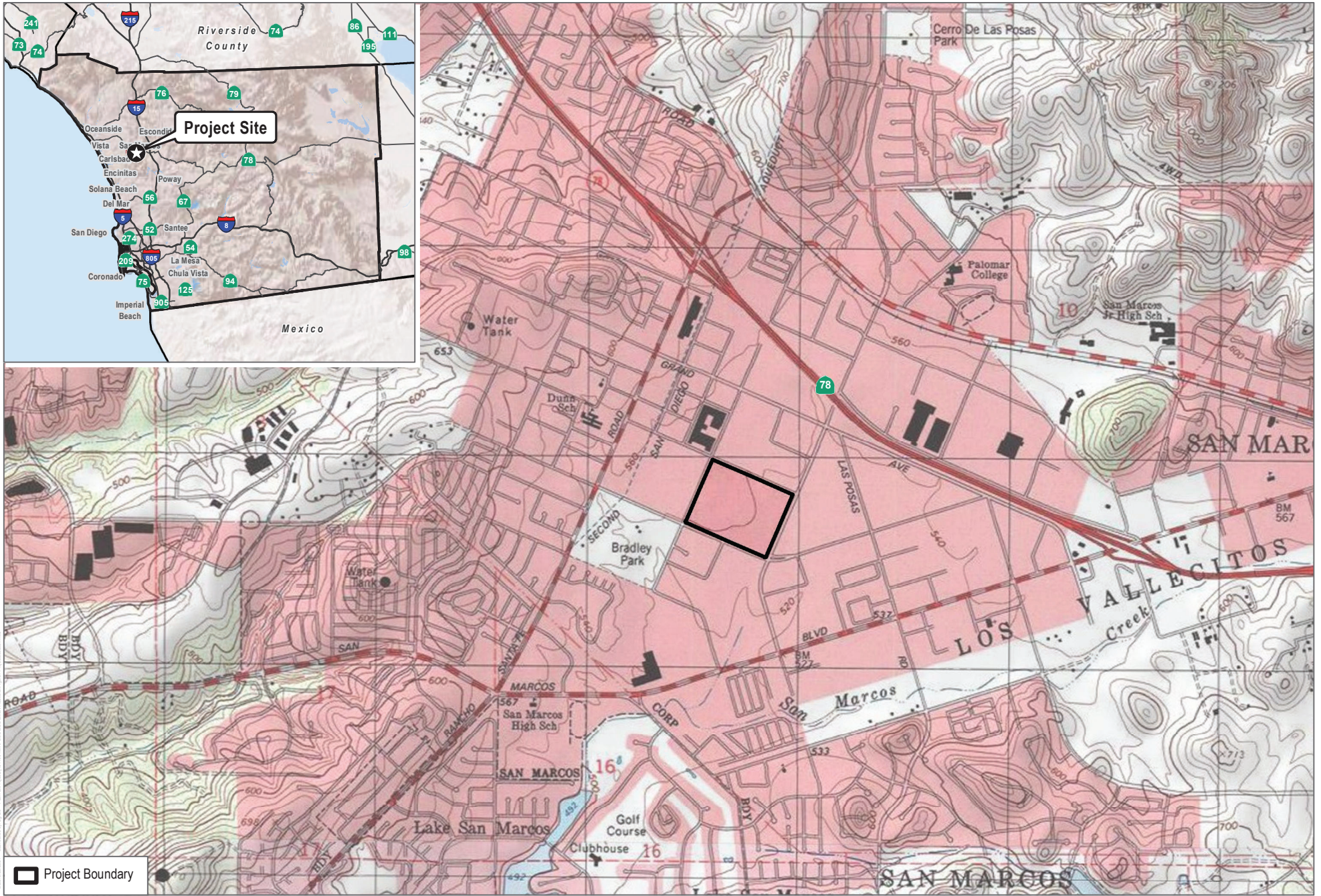
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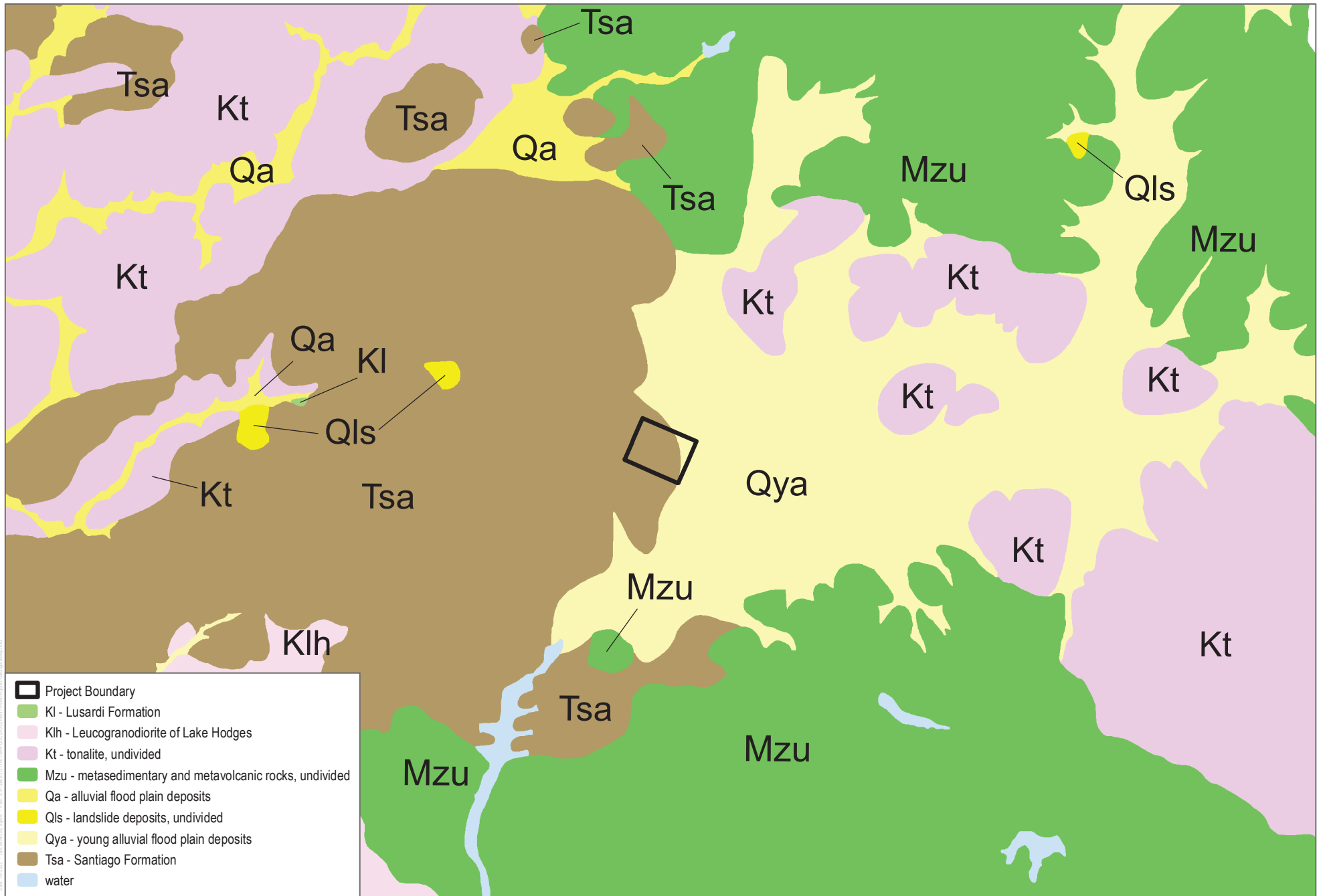
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SOURCE: USGS 7.5-Minute Serues San Marcos Quadrangle

FIGURE 1
Project Location
Pacific GPA/Rezone EIR



SOURCE: SANGIS 2020

FIGURE 2
Geological Map
 Pacific GPA/Rezone EIR

