

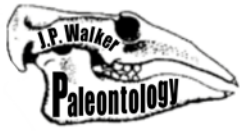
**Paleontological Review and Mitigation Plan for
120 East Grand Avenue Project Including
130 East Grand Avenue and 129, 145, 160 and
180 Sylvester Road
South San Francisco, San Mateo County, California**

Prepared December 11, 2022

Prepared By:



This Paleontological Mitigation Plan was prepared to conform to the standards of the Society of Vertebrate Paleontologists (SVP) Standard Procedures for the Assessment and Mitigation of Adverse Impacts to Paleontological Resources.



Introduction

The proposed 120 East Grand Avenue project site covers approximately four acres and consists of six assessor's parcels - 120 and 130 East Grand Avenue and 129, 145, 160, and 180 Sylvester Road - and is located in the Lindenville sub-area, City of South San Francisco, San Mateo County. The proposed project will demolish the existing buildings and hardscape on the six parcels for biotech lab/office space with an associated parking structure (USGS San Francisco South, CA 1995, T 3S, R 5W, unsectioned). The project site has no exposed native soils.

Regional Geology and Paleontology

Geology

The geology of the area under and surrounding the site is characterized by Artificial fill on the surface that is in turn underlain by Alluvial deposits of Holocene and Pleistocene age. Nearby outcrops of the Colma formation suggest that it underlies the alluvium (Figure 1). Other nearby outcrops include colluvium and the Franciscan Formation (Bonilla 1971). Regional mapping by Wentworth (1997) shows the general area of the site as being underlain by Holocene age Bay Mud.

Paleontology

A review of the University of California Museum of Paleontology (UCMP) and the US Geological Survey (USGS) collections shows that Pleistocene deposits in the area have produced only 12 paleontological specimens. These include: *Glossotherium* sp. (sloth), *Mammuthus columbi* (mammoth), *Equus* sp. (horse), *Mammot americanum* (mastodon), *Megalonyx*, sp (giant sloth), *Hemiachenia* sp.(camel/lama) and *Chondrichthyes* (sharks and rays). Additionally, Pleistocene age *Mammuthus* sp. and *Mammuthus columbi* and *Bison Latriformis* have been reported from the Colma Formation (Rodda and Baghai 1993).

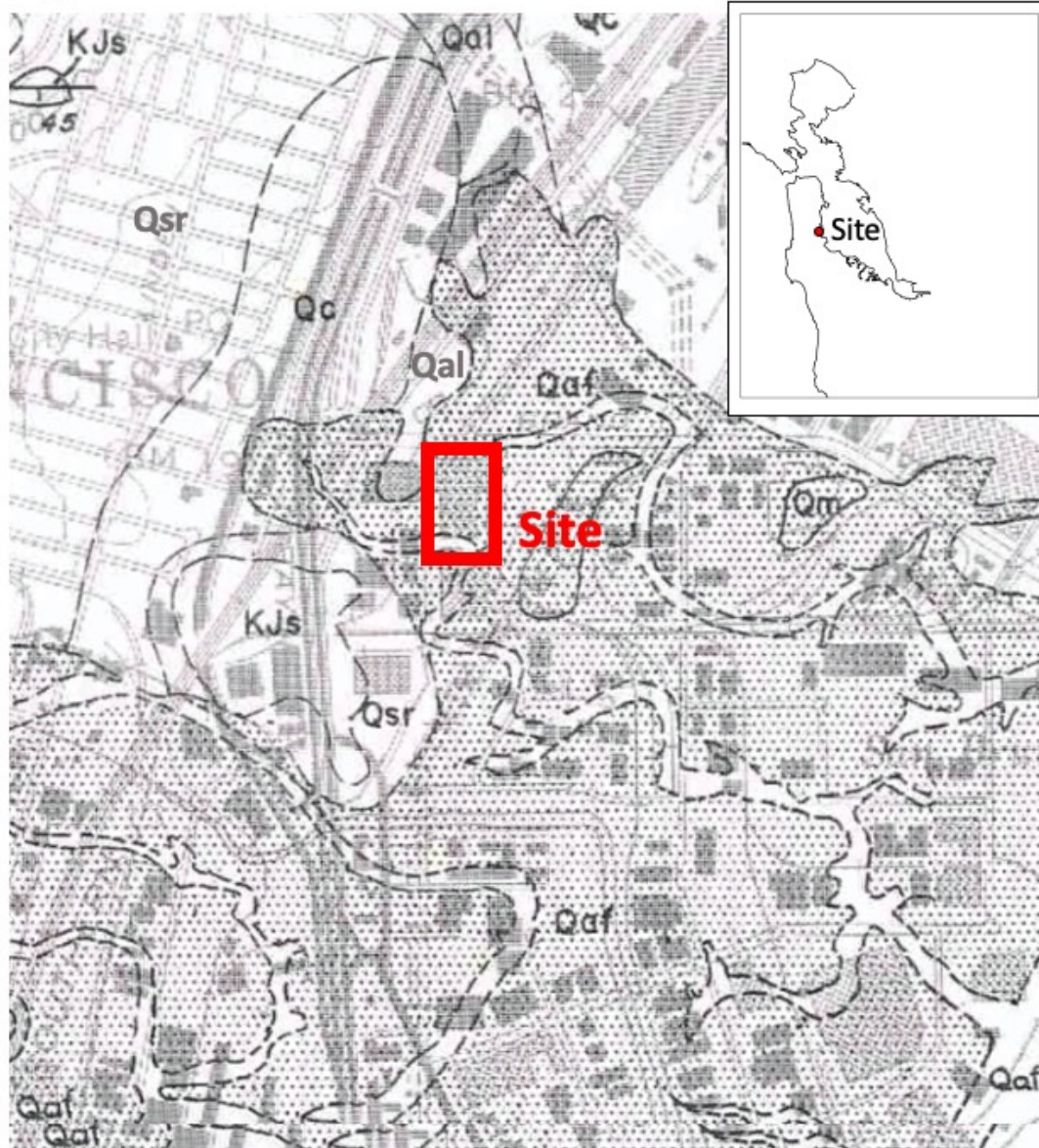
Site Geology and Paleontological Potential

As noted above, the site is developed and aerial photos show no evidence of exposed soils.

Site Geology

Mapping shows the area as artificial fill (Figure 1). This mapping also depicts alluvium and the Colma Formation nearby (Bonilla 1971). Based on the mapping pattern these two units are expected to underlay the project site. As noted above regional mapping by Wentworth (1997) suggests that Holocene Bay Muds may underlay the site as well and if they do, it would be expected that they would replace or interfinger the similar age alluvium.

Figure 1



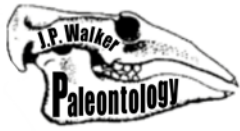
Explanantion

Qaf Artificial fill
Qal Alluvium
Qm Bay mud
Qsr Colluvium
Qc Colma Formation
KJS Franciscan Formation

From Bonilla 1971, MF311

Contact approximate

500 meters



Paleontological Potential

It is expected that any construction excavations will be relatively shallow and therefore confined to the artificial fill. Building foundations will use auger cast piers placed to greater depths that will likely intersect the Pleistocene age alluvium and the Pleistocene Colma Formation. However, the known fossil locations associated with these units are more than six miles from the project site. The local depositional conditions probably vary widely from those at the locations where the finds are listed.

A formal paleontological site records search was completed by the UCMP for the project site with the following results:

The nearest vertebrate find is a single Pleistocene Equus tooth (UCMP 64829) from UCMP locality V6319 that is located approximately 2.4 miles (3.8) km west of your project site, near the I-280/Westborough interchange. There is no depth data given, but the lithology is noted as a pebbly mudstone.

Based on the location information this site appears to be in the Merced Formation, a unit not present at the 120 East Grand Project site (Bonilla 1971). The other fossil locations while in units present at the project site are far enough away that the depositional setting is not related to the units at the site. Furthermore, these units will only be encountered at depth via augering for the piers displacing relatively small amounts of material with little or no geologic context, therefore the potential of encountering fossil material is considered low. The Society of Vertebrate Paleontologists (SVP) Guidelines definition of low potential is given below.

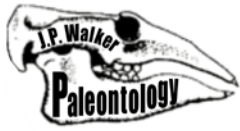
Low Potential

Reports in the paleontological literature or field surveys by a qualified professional paleontologist may allow determination that some rock units have low potential for yielding significant fossils. Such rock units will be poorly represented by fossil specimens in institutional collections, or based on general scientific consensus only preserve fossils in rare circumstances and the presence of fossils is the exception not the rule, e. g. basalt flows or Recent colluvium. Rock units with low potential typically will not require impact mitigation measures to protect fossils.

Mitigation Measures

Monitoring Program

A paleontological monitor during ground disturbing construction is not required because the project site is assigned a low potential for paleontological finds. In the event of a paleontological find, monitoring may be needed based on an assessment by a professional paleontologist.



Worker Awareness Training

Worker Awareness Training is recommended for construction personnel involved with excavation work in regard to an unexpected paleontological discovery. Personnel can be trained to identify potential paleontological material and the procedures to follow, and the correct personnel to contact in the event of a discovery. Training can often help avoid delays in construction and the associated costs. Training can be done on site during a “tool-box” session or remotely.

Procedure in Case of Significant Paleontological Finds

If a paleontological find is made and the find is determined to be significant, work will be redirected around the location of the find while it is stabilized and removed. The specimen will then be cleaned to the point necessary for identification, and then curated at a museum meeting SVP Guidelines. A brief report will be made and submitted with the specimen(s) to the museum. In the event of a potentially significant paleontological resource discovery, the following procedures will be followed:

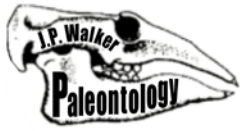
- The Project Paleontologist will conduct a preliminary evaluation of the paleontological resources to determine if additional mitigation (e.g., collection, curation and monitoring) is required. The initial phase of this may be done remotely via photographs and or video.
- Work may continue once the potential resource has been salvaged and moved to a designated collection area away from the construction zone.

The Paleontologist (or a designated monitor) will maintain detailed field notes recording dates, times, locations within the project site, activities undertaken, and especially the details of fossil find and their geologic contexts. Written records of specific locations and geologic contexts of each observed specimen location will be supplemented by field photographs showing specimens in situ, field number(s), and appropriate ruler or other scale objects within the field of view. Global Positioning System (GPS) determinations of latitude and longitude or Universal Transverse Mercator (UTM) coordinates will be noted for each collected specimen or concentrated locality. Geologic and geographic relationships of fossil localities to visible features within the enclosing geologic formation, such as changes in color or grain size, will also be noted.

Screen Washing

Many significant vertebrate fossils (e.g., small mammal, bird, reptile, amphibian, or fish remains) often are too small to be readily visible in the field but are nonetheless important and worthy of attention. The potential for the discovery of macrovertebrates at this project site also suggests a potential for microvertebrates as well. Potential microvertebrates would be sampled by collecting an adequate quantity of sedimentary matrix. To avoid construction delays, these samples would be transported to an offsite location for processing as described below.

Recovery of microvertebrate fossils will be accomplished by screenwashing bulk samples of fossil-bearing sedimentary matrix. The matrix is placed into water-filled five-gallon plastic



buckets to soak for no less than 15 minutes with stirring. The slurry is then poured onto nested 20 (0.84 mm openings) and 30 (0.59 mm) mesh stainless steel screens placed in water-filled troughs. Manual agitation of the screens forces the fine clays and silts through the mesh and concentrates the coarser sand and fossil material on the screens. The screens are then placed at a tilt facing the sun to dry. Once dry, the coarse concentrate is transferred into plastic sample bags and labeled with all pertinent site locality data. Screenwashed concentrates can be further concentrated by the use of heavy liquids (e.g., zinc bromide and/or tetrabromoethane) to concentrate particles of equal density. Generally, fossil bones and teeth sink along with heavy mineral grains (e.g., magnetite) while lighter quartz and feldspar mineral grains float. This separation process produces a very rich concentration of fossil remains, typically isolated teeth of small mammals (e.g., rodents).

Screen washing and picking will be conducted in parallel monitoring so that assessments may be made as to the utility of screen washing, negative finds may lead to stopping of bulk sample collection and screening.

Preparation and Curation of Fossils

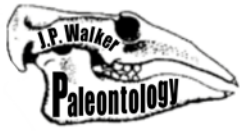
Any significant fossils recovered during Project activities will be cleaned to the point of preliminary identification and stabilized for storage and transport to their curation location. The final curation agreement will be included with the Paleontological Mitigation Report. Because the cost of curation is usually dictated by volume, all excess matrix should, to the greatest extent possible, be removed from the fossil during the preliminary analysis or pre-curation preparation. Only significant, diagnostic fossils need be curated.

Documentation

At the conclusion of monitoring a Paleontological Mitigation Report shall be prepared by the Project Paleontologist documenting implementation of the approved PMP. The report will adhere to SVP Guidelines, and will include discussions of:

- Project effects
- Regulatory requirements
- Purpose of mitigation
- Regional geologic context
- Project stratigraphy
- Stratigraphic and geographic distribution of paleontological resources
- Field and laboratory methods and procedures
- Paleontological significance

The report, in the event significant fossil resources are found, will also include geological cross-sections and stratigraphic sections, where appropriate, depicting fossil discovery localities and excavated rock units; maps showing the Project geology and location of discovered fossil localities; and appropriate photographs or illustrations depicting site conditions and the field context of collecting localities. An itemized listing of catalogued fossil specimens, complete



descriptions of all fossil collecting localities, and a signed curation agreement with the approved paleontological repository will be included as appendices to the report.

References

Bonilla, M.G., 1971. Preliminary geologic map of the San Francisco South quadrangle and part of the Hunters Point quadrangle, California: Miscellaneous Field Studies Map MF-311, scale 1:24,000

Society of Vertebrate Paleontology (SVP), 2010, Standard procedures for the assessment and mitigation of adverse impacts to paleontological resources: Society of Vertebrate Paleontology, 11 p.

Rodda, Peter U., and Baghai, Nina. "Late Pleistocene Vertebrates from Downtown San Francisco, California." *Journal of Paleontology*, vol. 67, no. 6, 1993, pp. 1058–63.

Wentworth, C.M. 1997. General Distribution of Geologic Materials in the San Francisco Bay Region, California: A Digital Map Database: U.S. Geological Survey Open-File Report 98-795, 52 p., scale 1:100,000.

University of California Museum of Paleontology database: <http://www.ucmp.berkeley.edu>