3.11 PALEONTOLOGICAL RESOURCES

This section evaluates the potential impacts of the proposed project on paleontological resources. The evaluation is based on a review of geotechnical reports prepared for the proposed project and paleontological reports available at the San Diego Natural History Museum.

3.11.1 Existing Conditions

Paleontological resources (i.e., fossils) are the remains and/or traces of prehistoric plant and animal life exclusive of humans. Fossil remains such as bone, teeth, shells, and wood are found in the geologic formations in which they were originally buried, typically within deep bedrock layers of sandstone, mudstone, and shale. Paleontological resources represent a limited, nonrenewable, and sensitive scientific and educational resource (Deméré and Walsh 1994). A direct relationship exists between a geologic formation and the fossils that occur within it. Knowing the geology of an area and the paleontological sensitivity of particular geologic formations makes it possible to predict where fossils will and will not occur. In general, formations that are sedimentary in origin have the potential to contain fossils, and formations that are igneous in origin do not (Deméré and Walsh 1994).

According to the Preliminary Geotechnical Investigation (Jacobs Associates 2005), as discussed in Section 3.10, the project area consists of surficial deposits of artificial fill, alluvium, topsoil and colluvium, and Quaternary-age landslide deposits. Rocks of the Pomerado Conglomerate, Mission Valley Formation, Stadium Conglomerate, Friars Formation, and Santiago Peak Volcanics underlie the project area. The Pomerado Conglomerate, Mission Valley Formation, Stadium Conglomerate, and Friars Formation consist of Eocene age (approximately 37 to 46 million years old) sedimentary rocks. Santiago Peak Volcanics are much older Jurassic-age (approximately 120 to 140 million years old) mildly metamorphosed volcanic, volcaniclastic, and sedimentary rocks (Kennedy and Peterson 1975). The geology analysis identifies the on-site Santiago Peak Volcanics as fine-grained metavolcanic rock (Section 3.10).

A paleontological records search was conducted at the San Diego Museum of Natural History to determine the sensitivity for fossil remains in the project area and whether any fossil localities have been recorded within a 1-mile radius of the project site. The museum has 25 recorded fossil localities within 1 mile of the project site with eight of these localities within the same formations found in the project area. One of these localities is within the terrestrial Pomerado Conglomerate and produced fossils of plants (e.g., flowering plants) and invertebrates (e.g., clams); one locality is within the marine Mission Valley Formation and produced fossils of marine vertebrates (e.g., sharks) and non-marine vertebrates (e.g., soft shelled turtles, fish, insectivores, primates, and rodents); and six localities are within the Friars Formation and produced fossils of terrestrial invertebrates (e.g., ostracods and snails) and vertebrates (e.g., crocodiles, lizards, marsupials, insectivores, bats, primates, rodents, oreodonts, and brontotheres).

Mission Valley Formation, Stadium Conglomerate, and Friars Formation are considered to have high sensitivity for fossil remains, Pomerado Conglomerate is considered to have moderate sensitivity, and the Santiago Peak Volcanics are considered to have low sensitivity for fossils.
(Deméré and Walsh 1994). Alluvium and landslide materials have unknown sensitivity, but as these formations are sedimentary in origin, they are considered to have some potential to contain fossils.

3.11.2 Thresholds of Significance

Thresholds used to evaluate potential impacts to paleontological resources are based on applicable criteria in the State CEQA Guidelines (CCR §§15000-15387), Appendix G. A significant impact to paleontological resources would occur if the project would:

- Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature.

3.11.3 Impact Analysis

*Would the proposed project directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?*

The proposed project would require excavation to a depth of approximately 50 feet below existing ground level for the FRS II. This excavation, which could involve up to 105,000 cy, would occur mostly in Pomerado Conglomerate, with intrusions of Mission Valley Formation. Excavation for the 13-foot-diameter tunnel would be at shallow depths under canyons and as much as 225 feet below ground under the North Ridge in MTRP. This excavation, which could involve as much as 48,000 cy, would occur mostly in Mission Valley Formation, with the first 200 to 1,000 feet of tunneling at the northern end of the project occurring in Santiago Peak Volcanics. The shaft excavations would occur in Pomerado Conglomerate.

The proposed project would involve grading and excavation in formations considered to have moderate and high sensitivity for fossil remains. The project would also involve construction in close proximity to areas documented to contain fossil remains. Therefore, grading associated with the proposed project has the potential to result in impacts to paleontological resources. This impact would be significant *(Impact PR 1).*

3.11.4 Mitigation Measures

To mitigate potentially significant impacts to paleontological resources, the Water Authority shall implement the following mitigation measures:

**PR 1-1** The following measures shall be carried out by a qualified professional paleontologist:

- Existing bedrock outcrops and (possibly) excavation of test trenches shall be inspected for fossil remains.

- Surface collection of discovered fossil remains shall be conducted via simple excavation of exposed specimens and possibly plaster-jacketing of large and/or
fragile specimens or more elaborate quarry excavations of richly fossiliferous deposits.

- Stratigraphic and geologic data shall be recovered to provide context for recovered fossil remains. These data will typically include a description of lithologies of fossil-bearing strata, measurement and description of the overall stratigraphic section, and photographic documentation of the setting.

- Laboratory preparation of collected fossil remains shall be conducted for potentially significant or unique finds.

- Prepared significant or unique fossil remains shall be cataloged and identified.

- Cataloged fossil remains shall be transferred for storage to an accredited institution.

- A final report summarizing the findings from the laboratory and field, stratigraphic units inspected, types of fossils discovered, and the significance of the curated collection shall be prepared.

### 3.11.5 Residual Impacts after Mitigation

No residual impacts would remain after implementation of the proposed mitigation measures.
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