

2.7 Paleontological Resources

The analysis presented in this section evaluates the potential for impacts to paleontological resources based on existing geologic formations that underlay the Project site. Refer to Section 3.2.3, *Geology and Soils*, for a discussion of the geologic formations that could be affected by the Project.

2.7.1 Existing Conditions

2.7.1.1 *Environmental Setting*

Paleontological resources are the remains and/or traces of prehistoric life, exclusive of human remains, and include the localities where fossils were collected and the sedimentary rock formations from which they were obtained/derived. The defining character of fossils is their geologic age. Fossils or fossil deposits are generally regarded as older than 10,000 years, the generally accepted temporal boundary marking the end of the last Late Pleistocene glacial event and the beginning of the current period of climatic amelioration of the Holocene (County of San Diego 2009).

A unique paleontological resource is any fossil or assemblage of fossils, or paleontological resource site or formation that meets any one of the following criteria (County of San Diego 2009):

- The best example of its kind locally or regionally;
- Illustrates a paleontological or evolutionary principle (e.g., faunal succession; plant or animal relationships);
- Provides a critical piece of paleobiological data (illustrates a portion of geologic history or provides evolutionary, paleoclimatic, paleoecological, paleoenvironmental, or biochronological data);
- Encompasses any part of a “type locality” of a fossil or formation;
- Contains a unique or particularly unusual assemblage of fossils;
- Occupies a unique position stratigraphically within a formation; or
- Occupies a unique position, proximally, distally or laterally within a formation’s extent or distribution.

Per the County of San Diego (County) Guidelines, paleontological sensitivity is defined as follows:

- **High Sensitivity** - High sensitivity is 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 paleobiology and evolutionary history (phylogeny) of animal and plant groups. Generally speaking, highly sensitive formations produce vertebrate fossil remains or are considered to have the potential to produce such remains.

2.7 Paleontological Resources

- **Moderate Sensitivity** - Moderate sensitivity is assigned to geologic formations known to contain paleontological localities with poorly preserved, common elsewhere, or stratigraphically unimportant fossil material. The moderate sensitivity category is also applied to geologic formations that are judged to have a strong, but unproven potential for producing important fossil remains (Bay Point Formation).
- **Low Sensitivity** - Low sensitivity is assigned to geologic formations that, based on their relatively youthful age and/or high-energy depositional history, are judged unlikely to produce important fossil remains. Typically, low sensitivity formations produce poorly-preserved invertebrate fossil remains in low abundance (Quaternary Alluvium).
- **Zero Sensitivity** - Zero sensitivity is assigned to geologic formations that are entirely igneous in origin and therefore have no potential for producing fossil remains. Artificial fill materials are also placed in this category.

Underlying Geology

As described in the Geotechnical Investigation prepared by Geocon Incorporated (July 20, 2016), the Project area is underlain by undocumented fill soil, topsoil, alluvium/colluvium, Old Terrace Deposits, and the Otay Formation. The sensitivity for each of these geologic formations that may contain important paleontological resources is described below.

Undocumented Fill Soils (Qudf)

Undocumented fill soils were observed throughout the north-central portion of the site. The undocumented fill soils contain considerable amounts of vegetation and debris. Undocumented Fill is not a native geologic unit and, therefore, has no potential for paleontological resources.

Topsoil (Unmapped)

Soft clayey topsoil overlies the majority of the site and has a somewhat uniform thickness of two to three feet. The topsoil generally consists of silty to sandy clays and clayey sands. Residual Soil is not a native geologic unit and, therefore, has no potential for paleontological resources.

Alluvium/Colluvium (Qal/Qc)

Undifferentiated alluvial/colluvial soils are composed primarily of compressible silty and sandy clays. The thickness of these soils range from three to seven feet with an average of five feet. Alluvium deposits are considered to have a “low” sensitivity for paleontological resources.

Old Terrace Deposits (Qt)

Quaternary-age Old Terrace Deposits consist of very dense, weakly-cemented to cohesionless sand, cobble, and boulders that cap the broad knoll in the central portion of the property and the southwestern corner of the site. Metavolcanic rock clasts are abundant and indicate that the Old Terrace Deposits probably originated from the nearby Otay Mountains. These terrace deposits are assigned a high paleontological resource sensitivity rating. Quaternary terrace deposits and Eocene Santiago Formation are considered to have a “high” sensitivity for paleontological resources

Otay Formation (To)

The Oligocene-age Otay Formation consists of very dense, light gray-brown to light brown, silty to clayey sandstones and hard, sandy claystones and siltstones. The Otay Formation is a fluvial sedimentary rock and numerous fossil localities have been discovered throughout San Diego County in this formation. Based on recent discoveries, the Otay Formation is considered to be a rich source of late Oligocene terrestrial vertebrates in California. Due to its potential to contain important, well-preserved fossils, the Otay Formation is assigned a “high” paleontological resource sensitivity rating.

2.7.1.2 Methodology

Geologic maps (at scales of 1:24,000, 1:100,000, etc.) of areas of San Diego County show the distribution of various geologic formations. Based on these maps and information on previously recorded fossil finds, geologic formations in San Diego County have been characterized as having High, Moderate, Low, Marginal, or No Potential for paleontological resource (Deméré and Walsh 1993). Because paleontological resources usually are irregularly dispersed throughout a geologic formation, both vertically as well as laterally, the location of fossils within a particular formation cannot be pre-determined. Comparing the Project site to a resource map showing the potential of formations to produce fossils is the first step in assessing the potential for paleontological resources to be present on a project site. More precise determinations of the potential presence of paleontological resources can be made by studying more detailed geologic maps.

In order to determine the occurrence of potentially significant paleontological resources, an evaluation of existing geological resources was undertaken by GEOCON, Inc. (Updated Geotechnical Investigation; July 20, 2015). Information from this investigation was utilized to determine the underlying soils and geologic formations of the Project site. The County’s Guidelines for Determining Significance were then consulted to determine where significant impacts may occur.

2.7.1.3 Regulatory Framework

State

California Environmental Quality Act

Under CEQA, lead agencies are required to consider impacts to unique paleontological resources. CEQA requires an assessment of impacts associated with the direct or indirect destruction of unique paleontological resources or sites that are of value to the region or State.

Local

County of San Diego General Plan – Conservation and Open Space Element

The following goals and policies identified in the county General Plan Conservation and Open Space Element are applicable to the proposed project (County of San Diego 2011):

- **Goal COS-9: Education and Scientific Uses.** Paleontological resources and unique geologic features conserved for educational and/or scientific purposes.
- **Policy COS-9.1: Preservation.** Require the salvage and preservation of unique paleontological resources when exposed to the elements during excavation or grading activities or other development processes.
- **Policy COS-9.2: Impacts of Development.** Require development to minimize impacts to unique geological features from human related destruction, damage or loss.

County of San Diego Grading Ordinance

The County Grading Ordinance requires that projects involving grading, clearing, and/or removal of natural vegetation obtain a grading permit, unless the project meets one or more of the exemptions listed in Section 87.202 of the Grading Ordinance. The grading permit is discretionary and requires compliance with CEQA. Section 87.430 of the Grading Ordinance provides that the County official (e.g., permit compliance coordinator) may require a paleontological monitor during all or selected grading operations, to monitor for the presence of paleontological resources. If fossils greater than 12 inches in any dimension are encountered, then all grading operations in the area of discovery must be suspended immediately and not resumed until authorized by the County official. The Ordinance also requires immediate notification of the County official regarding the discovery. The County official must determine the appropriate resource recovery operation, which the permittee must carry out prior to the County official's authorization to resume normal grading operations (County of San Diego 2012).

2.7.2 Analysis of Project Effects and Determination as to Significance

2.7.2.1 Guidelines for Determination of Significance

For the purposes of this SEIR, the Project would result in a significant impact to Paleontological Resources if it:

- a) Proposes activities directly or indirectly damaging to a unique paleontological resource or site. A significant impact to paleontological resources may occur as a result of the Project if Project-related grading or excavation would disturb the substratum or parent material below the major soil horizons in any paleontologically sensitive area of the County, as shown on the San Diego County Paleontological Resources Potential and Sensitivity Map.

This guideline is derived from CEQA (Appendix G). It requires the evaluation of paleontological resources to determine whether a proposed action will have a significant effect upon paleontological resources.

2.7.2.2 1994 East Otay Mesa Specific Plan EIR

The East Otay Mesa Specific Plan EIR did not address impacts to paleontological resources. As such, the County of San Diego has determined that the current SEIR must evaluate the potential for site-specific impacts to previously undisclosed sensitive paleontological resources.

2.7.2.3 2000 East Otay Mesa Specific Plan Sunroad Centrum SEIR

The East Otay Mesa Specific Plan Sunroad Centrum SEIR did not address impacts to paleontological resources. As such, the County of San Diego has determined that the current SEIR must evaluate the potential for site-specific impacts to previously undisclosed sensitive paleontological resources.

2.7.2.4 2012 Sunroad Otay Tech Centre Addendum

The 2012 Sunroad Otay Tech Centre Addendum did not address impacts to paleontological resources. As such, the County of San Diego has determined that the current SEIR must evaluate the potential for site-specific impacts to previously undisclosed sensitive paleontological resources.

2.7.2.5 Proposed Project

Guidelines for the Determination of Significance:

Would the proposed Project result in activities directly or indirectly that have the potential to damage a unique paleontological resource or site?

The Project site is located within a “High” paleontological sensitive area of the County, as shown on the County Paleontological Resources Potential and Sensitivity Map (County of San Diego 2009). The upper sandstone/mudstone member of the Otay Formation is considered to have “high paleontological resource sensitivity” and the middle gritstone and lower fanglomerate members of the Otay Formation are considered to have “moderate paleontological resource sensitivity.” Both of these members occur within the Project site. Furthermore, the Otay Formation is considered the richest source of Late Oligocene terrestrial vertebrates in California. The Project would result in 1,350,000 cubic yards of cut (utilized as fill elsewhere on the site), which may occur in part within areas of Otay Formation. This volume of excavation would exceed the County’s threshold of 2,500 cubic yards in areas of high or moderate paleontological sensitivity and, therefore, implementation of the proposed Project could result in potentially significant impacts to these paleontological resources (**Impact PR-1**). According to the County Guidelines for Determining Significance for Paleontological Resources, monitoring of excavation activities during grading is required and unearthened fossil remains are to be salvaged, identified, and prepared for curation.

2.7.3 Cumulative Impact Analysis

Cumulative projects which affect the same underlying geologic formation as the proposed Project could have the potential to result in similar impacts to important paleontological resources, particularly if the Otay Formation would be affected by grading for those projects. Table 1-6, *Cumulative Projects List*, provides a summary of all the cumulative projects along with their identified impacts to each of the environmental issue areas addressed by this SEIR. Specifically identified in Table 1-6, four projects contain paleontologically sensitive geologic formations that have the potential to result in significant impacts to paleontological resources. Together with the proposed Project, cumulatively significant impacts to paleontological resources could result (**Impact PR-2**).

It should be noted that the City of San Diego has similar thresholds of significance and monitoring requirements for paleontological resources. As such, impacts to paleontological resources within the City and County portions of Otay Mesa would be subject to similar mitigation requirements. As required mitigation, all of these projects would provide paleontological monitors during grading and earthwork activities. In the event that fossils were uncovered during earthwork and grading activities, a fossil data recovery program would be implemented for each project, which would consist of collecting, cleaning, and cataloguing significant discovered fossils.

2.7 Paleontological Resources

Although cumulatively significant impacts to paleontological resource deposits could occur as a result of grading activities associated with the proposed Project when considered with other development on Otay Mesa, the proposed Project and other projects that result in grading within the Otay Formation would be required to implement measures to mitigate those impacts. Thus, cumulative effects associated with paleontological resources would be mitigated to below a level of significance.

2.7.4 Significance of Impacts Prior to Mitigation

The following significant impacts were identified in the analysis of the Project's effect on paleontological resources:

PR-1 Potential impacts to paleontological resources within the upper sandstone/mudstone, middle gritstone, and lower fanglomerate members of the Otay Formation. (Potentially significant direct impact.)

PR-2 Contribution to cumulative paleontological resources impacts within the cumulative project area. (Potentially significant cumulative impact.)

2.7.5 Mitigation

M-PR-1 Paleontological monitoring shall be conducted during all mass grading and excavation activities in surface exposures of the Otay Formation to mitigate any adverse impacts (i.e., loss or destruction) to potential nonrenewable paleontological resources. A mitigation monitoring and reporting program consistent with County and CEQA guidelines and requirements shall be implemented prior to any mass grading and/or excavation-related activities, including utility trenching, within the Otay Formation. The mitigation monitoring and reporting program shall be conducted in accordance with the following procedures:

- A. A Qualified Paleontologist or Paleontological Resources Monitor (under the supervision of the Qualified Paleontologist) shall be on-site during all excavation operations within geologic formations that may contain paleontological resources (i.e., the Otay Formation). The Qualified Project Paleontologist is a person with a Ph.D. or master's degree in paleontology or related field, and who has knowledge of San Diego County paleontology, and documented experience in professional paleontological procedures and techniques. A Paleontological Monitor is defined as an individual with at least 1 year of experience in field identification and collection of fossil materials. The Paleontological Monitor shall work under the direct supervision of the Qualified Paleontologist. The applicant shall authorize the Qualified Paleontologist and/or Paleontological Monitor to direct, divert, or halt any grading activity, and to perform all other acts required by the provisions listed below.

2.7 Paleontological Resources

- B. The Qualified Paleontologist and/or Paleontological Monitor shall monitor all grading and excavation activities of undisturbed formations of sedimentary rock;
- C. If paleontological resources are unearthed, the Qualified Paleontologist or Paleontological Monitor shall do the following:
 - 1. Direct, divert, or halt any grading or excavation activity until such time that the sensitivity of the resource can be determined and the appropriate recovery implemented.
 - 2. Salvage unearthed fossil remains, including simple excavation of exposed specimens or, if necessary, plaster-jacketing of large and/or fragile specimens or more elaborate quarry excavations of richly fossiliferous deposits.
 - 3. Record stratigraphic and geologic data to provide a context for the recovered fossil remains, typically including a detailed description of all paleontological localities within the Project site, as well as the lithology of fossil-bearing strata within the measured stratigraphic section, if feasible, and photographic documentation of the geologic setting.
 - 4. Prepare collected fossil remains for curation to include cleaning the fossils by removing the enclosing rock material; stabilizing fragile specimens using glues and other hardeners, if necessary; and repairing broken specimens.
 - 5. Curate, catalog, and identify all fossil remains to the lowest taxon possible; inventory specimens; assign catalog numbers; and enter the appropriate specimen and locality data into a collection database.
 - 6. Transfer the cataloged fossil remains to an accredited institution (museum or university) in California that maintains paleontological collections for archival storage and/or display. The transfer shall include copies of relevant field notes, maps, stratigraphic sections, and photographs.
- D. The Qualified Paleontologist shall prepare a final Paleontological Resources Mitigation Report summarizing the field and laboratory methods used, the stratigraphic units inspected, the types of fossils recovered, and the significance of the curated collection.
- E. Submit two hard copies of the final Paleontological Resources Mitigation Report to the Director of PDS for final approval of the mitigation, and submit an electronic copy of the report according to the County PDS Electronic Submittal Format Guidelines.

2.7.6 Conclusion

The proposed Project would result in potentially significant direct and cumulative impacts to paleontological resources (Impacts **PR-1** and **PR-2**, respectively). Mitigation measure **M-PR-1** for paleontological monitoring and salvage of fossils during all mass grading and excavation activities requires mitigation of any adverse impacts from loss or destruction of paleontological resources. Implementation of the mitigation measure would reduce the potentially significant impacts (direct, cumulative) to paleontological resources to a less than significant level.