

IV. Environmental Impact Analysis

E. Geology and Soils

1. Introduction

This section of the Draft EIR provides an analysis of the Project's potential impacts with regard to paleontological resources. Impacts relating to geology and soils, including seismic impacts, the geologic stability of the Project Site, liquefaction, erosion, subsidence, and expansive soils were determined to be less than significant in the Initial Study (Appendix A) and will be briefly addressed in this EIR. The geotechnical investigation for the Project Site is provided in Appendix E. The analysis is based on a review of California regulatory requirements, City of Los Angeles requirements, as well as on the following report (refer to Appendix D of this Draft EIR):

- Cultural and Paleontological Resources Assessment Report for the Prologis Vermont Avenue and Redondo Beach Industrial Project, Cogstone Resource Management Inc., February 2020.

2. Environmental Setting

a. Regulatory Framework

There are several plans, regulations, and programs that include policies, requirements, and guidelines regarding Geology and Soils at the federal, state, regional, and local levels. As described below, these plans, guidelines, and laws include the following:

- California Public Resources Code (PRC) Section 5097.5
- General Plan Conservation Element

State and local laws and regulations govern the treatment of paleontological resources. There are specific criteria for determining whether prehistoric or historic sites and objects are significant and/or protected by law. State significance criteria generally focus on the resource's integrity and uniqueness, its relationship to similar resources and its potential to contribute important information to scholarly research. The applicable laws and regulations that seek to mitigate impacts to significant paleontological resources are summarized in the following discussion.

(1) State

- a. California Code of Regulations, Title 14, Division 3, Chapter 1, Section 4307*

California Code of Regulations, Title 14, Division 3, Chapter 1, Section 4307 states in part that "A person shall not knowingly and willingly excavate upon, or remove, destroy, injure, or deface any

. . . paleontological... feature.” California Public Resources Code (PRC) Section 5097.5 protects cultural resources on public lands and provides that any unauthorized removal of paleontological feature is a misdemeanor.

b. California Code of Regulations, Title 14, Division 3, Chapter 3, Section 15000 et seq. (CEQA Guidelines)

The CEQA Guidelines (Title 14, Chapter 3 of the California Code of Regulations, Section 15000 et seq.) define the procedures, types of activities, individuals, and public agencies required to comply with CEQA. As part of CEQA’s Initial Study process, and in addition to several questions focused on hazards associated with geology and soils, one of the questions for lead agencies relates to paleontological resources: “Will the proposed project directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?” (CEQA Guidelines Section 15023, Appendix G, Section XIV, Part a).

The loss of any identifiable fossil that could yield information important to prehistory, or that embodies the distinctive characteristics of a type of organism, environment, period of time, or geographic region, would be a significant environmental impact. Impacts to paleontological resources primarily concern the potential destruction or unauthorized collection of nonrenewable paleontological resources and the loss of information associated with these resources. In general, where paleontologically sensitive geologic units underlie project sites, the greater the amount of ground disturbance, the higher the potential for impacts to paleontological resources. Where geologic units with no paleontological sensitivity directly underlie project sites, there is no potential for impacts on paleontological resources, unless sensitive geologic units which underlie the non-sensitive units are also affected.

c. California Public Resources Code (PRC) Section 5097.5

State requirements for paleontological resource management are included in PRC Section 5097.5 and Section 30244. These statutes prohibit the removal of any paleontological site or feature from public lands (as used in this section, lands owned by, or under the jurisdiction of, the State, any city, county, district, authority, or public corporation, or any agency thereof) without permission of the jurisdictional agency, define the removal of paleontological sites or features as a misdemeanor, and require reasonable mitigation of adverse impacts to paleontological resources from developments on public (State, county, city, or district) lands.

(2) Local

a. City of Los Angeles General Plan Conservation Element

The City’s General Plan Conservation Element recognizes paleontological resources in Section 3: “Archeological and Paleontological” (II-3), specifically the La Brea Tar Pits, and identifies protection of paleontological resources as an objective (II-5). The General Plan identifies site protection as important, stating, “Pursuant to CEQA, if a land development project is within a potentially significant paleontological area, the developer is required to contact a bonafide paleontologist to arrange for assessment of the potential impact and mitigation of potential

disruption of or damage to the site. Section 3 of the Conservation Element, adopted in September 2001, includes policies for the protection of paleontological resources. As stated therein, it is the City's policy that paleontological resources be protected for historical, cultural research, and/or educational purposes. Section 3 sets as an objective the identification and protection of significant paleontological sites and/or resources known to exist or that are identified during "land development, demolition, or property modification activities." Section 5 of the Conservation Element recognizes the City's responsibility for identifying and protecting its cultural and historical heritage. The Conservation Element establishes the policy to continue to protect historic and cultural sites and/or resources potentially affected by proposed land development, demolition, or property modification activities, with the related objective to protect important cultural and historical sites and resources for historical, cultural, research, and community educational purposes.¹

b. Existing Conditions

Paleontology is the study of fossils, which are the remains of ancient life forms. Paleontological resources include fossil remains, fossil localities, and formations that have produced fossil material in other nearby areas. Paleontological resources are limited, nonrenewable, sensitive scientific and educational resources, including fossils preserved either as impressions of soft (fleshy) or hard (skeletal) parts, mineralized remains of skeletons, tracks, or burrows; other trace fossils; coprolites (fossilized excrement); seeds or pollen; and other microfossils from terrestrial, aquatic, or aerial organisms.

According to a records search prepared by the National History Museum of Los Angeles County, University of California Museum of Paleontology database, the PaleoBiology Database, and other print sources (included in Appendix D of this Draft EIR), there are no vertebrate fossil localities found within one mile of the Project Site. Six localities from the Pleistocene deposits were found between 1.5 to 3 miles, while fifteen localities were found between 3 to 10 miles of the Project Site. Extinct megafauna from these sites include ground sloth, mastodon, mammoth, dire wolf, horse, two types of pronghorn antelope, camel, and bison. All of the fossils were at least five feet deep in deposits mapped as late Pleistocene at the surface, while sediments with a Holocene component produced fossils starting from 11 feet in depth.

3. Project Impacts

a. Thresholds of Significance

In accordance with Appendix G of the State CEQA Guidelines, a project would have a significant impact related to geology and soils if it would:

¹ *City of Los Angeles General Plan, Conservation Element, pages II-6 to II-9.*

Threshold (a): *Directly or indirectly cause potential substantial adverse effects including the risk of loss, injury, or death involving:*

- i. Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area based on other substantial evidence of a known fault. Refer to Division of Mines and Geology Special Publication 42;*
- ii. Strong seismic ground shaking;*
- iii. Seismic-related ground failure, including liquefaction; or*
- iv. Landslides;*

Threshold (b): *Result in substantial soil erosion or the loss of topsoil; or*

Threshold (c): *Be located on a geologic unit or soil that is unstable or that would become unstable as a result of the project, and potentially result in on-or off-site landslide, lateral spreading, subsidence, liquefaction or collapse; or*

Threshold (d): *Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial direct or indirect risks to life or property; or*

Threshold (e): *Have soils incapable of adequately supporting the use of septic tanks or alternative waste water disposal systems where sewers are not available for the disposal of wastewater; or*

Threshold (f): *Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature.*

For this analysis, the Appendix G Thresholds are relied upon. The analysis utilizes factors and considerations identified in the City's 2006 L.A. CEQA Thresholds Guide, as appropriate, to assist in answering the Appendix G Threshold questions. The factors to evaluate geology and soils impacts include the following:

Geologic Hazards

- Cause or accelerate geologic hazards, which would result in substantial damage to structures or infrastructure or expose people to substantial risk of injury.

Sedimentation and Erosion

- Constitute a geologic hazard to other properties by causing or accelerating instability from erosion; or
- Accelerate natural processes of wind and water erosion and sedimentation, resulting in sediment runoff or deposition which would not be contained or controlled on-site.

Paleontological Resources

- Whether, or the degree to which, the project might result in the permanent loss of, or loss of access to, a paleontological resource; and whether the paleontological resource is of regional or statewide significance.

b. Methodology

To evaluate potential impacts related to paleontological resources, a records search was conducted with the National History Museum of Los Angeles County, University of California Museum of Paleontology database, the PaleoBiology Database, and other print sources (included in Appendix D of this Draft EIR). A pedestrian survey was also conducted to confirm the geological maps of the Project Site and assess sediments for their potential to contain fossils.

In order to assess the sensitivity of sediments for fossils at the Project Site, the Potential Fossil Yield Classification (PFYC) system developed by the Bureau of Land Management (BLM) was used. The PFYC system uses the geological setting and number of known fossil localities to determine the paleontological sensitivity of site. Using the PFYC system, geologic units are classified according to the relative abundance of vertebrate fossils or scientifically significant invertebrate or plant fossils and their sensitivity to adverse impacts within the known extent of the geological unit. The PFYC system ranks paleontological sensitivity using a scale of 1 to 5 (1 being very low; 5 being very high).

c. Project Design Features

No specific Project Design Features are proposed with regard to paleontological resources.

d. Analysis of Project Impacts

Threshold (a): Would the Project directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death involving:

i. Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the

State Geologist for the area or based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42.

As discussed in Chapter VI (Subsection Impacts Found not to be Significant) and in the Initial Study (Appendix A), the Project Site is not located within an Alquist-Priolo Earthquake Fault Zone. Thus, the Project would have no impact with respect to Threshold (a.i). **As such, no impacts associated with fault rupture would occur, and no further analysis is required.**

Threshold (a): Would the Project directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death involving:

ii. Strong seismic ground shaking?

As discussed in Chapter VI (Subsection Impacts Found not to be Significant) and in the Initial Study (Appendix A), the proposed structure would be required to be designed and built in compliance with the California Building Code (CBC), which contains provisions for earthquake safety based on factors, including occupancy type, the types of soil and rock on-site, and the probable strength of ground motion. Therefore, as the proposed structure would be designed to meet or exceed CBC standards for earthquake resistance, development of the Project would create less than significant impacts with respect to Threshold (a.ii). **As such, the Project would have a less than significant impact related to strong seismic ground shaking, and no further analysis is required.**

Threshold (a): Would the Project directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death involving:

iii. Seismic-related ground failure, including liquefaction?

As discussed in Chapter VI (Subsection Impacts Found not to be Significant) and in the Initial Study (Appendix A), the Project Site is not located within a liquefaction zone. Thus, the Project would have no impact with respect to Threshold (a.iii). **As such, no impacts associated with seismic-related ground failure, including liquefaction, would occur, and no further analysis is required.**

Threshold (a): Would the Project directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death involving:

iv. Landslides?

As discussed in Chapter VI (Subsection Impacts Found not to be Significant) and in the Initial Study (Appendix A), the Project Site is not located within a landslide area. Thus, the Project would

have no impact with respect to Threshold (a.iv). **As such, no impacts associated with landslides would occur, and no further analysis is required.**

Threshold (b): Would the Project result in substantial soil erosion or the loss of topsoil?

As discussed in Chapter VI (Subsection Impacts Found not to be Significant) and in the Initial Study (Appendix A), future development within the Project site would be required to comply with the National Pollutant Discharge Elimination System (NPDES) permit by preparing and implementing a Stormwater Pollution Prevention Plan (SWPPP) specifying best management practices (BMPs) for minimizing pollution of stormwater with soil and sediment during Project construction. Adherence to the BMPs in the SWPPP would reduce, prevent, or minimize soil erosion from Project-related grading and construction activities. As the proposed structure would be designed to meet or exceed CBC standards for earthquake resistance, development of the Project would create less than significant impacts with respect to Threshold (b). **As such, the Project would have a less than significant impact related to substantial soil erosion or the loss of topsoil, and no further analysis is required.**

Threshold (c): Would the Project be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction, or collapse?

As discussed in Chapter VI (Subsection Impacts Found not to be Significant) and in the Initial Study (Appendix A), the Project site is not susceptible to landslides or liquefaction. The proposed structure would be required to be designed and built in compliance with the CBC and the City of Los Angeles Building Code. Compliance with the CBC and City's Building Code would ensure impacts would be less than significant with respect to Threshold (c). **As such, the Project would have a less than significant impact related to unstable soils, and no further analysis is required.**

Threshold (d): Would the Project be located on expansive soil, as defined in Table 18 1 B of the Uniform Building Code (1994), creating substantial direct or indirect risks to life or property?

As discussed in Chapter VI (Subsection Impacts Found not to be Significant) and in the Initial Study (Appendix A), the proposed structure would be required to be designed and built in compliance with the CBC and the City of Los Angeles Building Code. Compliance with the CBC and City's Building Code would ensure impacts would be less than significant with respect to Threshold (d). **As such, the Project would have a less than significant impact related to unstable soils, and no further analysis is required.**

Threshold (e): *Would the Project have soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems where sewers are not available for the disposal of wastewater?*

As discussed in Chapter VI (Subsection Impacts Found not to be Significant) and in the Initial Study (Appendix A), the Project Site is located in a highly urbanized area, where wastewater infrastructure is currently in place. The Project would connect to existing sewer lines that serve the Project site and would not use septic tanks or alternative wastewater disposal systems and, thus, would have no impact with respect to Threshold (f). **As such, no impacts associated with unstable soils from the use of septic tanks or alternative wastewater disposal systems would occur, and no further analysis is required.**

Threshold (f): *Would the Project directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?*

(1) Impact Analysis

The proposed Project requires excavation and grading but previous disturbance of the Project Site from past construction activities has reduced the potential for paleontological resources or unique geologic features to exist on-site. Nonetheless, a paleontological resources records search and intensive pedestrian survey of the Project area was conducted by a qualified archeologist and cross-trained paleontologist.

As discussed above, there are no vertebrate fossil localities that lie directly within the Project Site boundaries based on the results of the records search and pedestrian survey. However, localities that are known from the same sediments were found within the study area near to the Project.

The Project Site is mapped entirely as middle to late Pleistocene older alluvium. The records search indicated that all previously recovered fossils were at least five feet deep and mapped as late Pleistocene at the surface. Sediments with a Holocene component produced fossils starting at 11 feet in depth. As shown in Table IV.E-1, sediments less than five feet below the surface are assigned a low potential for fossil (PFYC 2) due to the lack of fossils in these deposits, while sediments more than five feet below surface are assigned a moderate potential for fossils (PFYC 3) due to similar deposits producing fossils at that depth near the Project Site.

**Table IV.E-1
Paleontological Sensitivity Rankings**

Rock Unit	PFYC rankings				
	5 Very High	4 High	3 Moderate	2 Low	1 Very Low
Older alluvium, middle to late Pleistocene			More than 5 feet deep	Less than 5 feet deep	

Source: Cogstone 2020

Based on the preceding, there is potential for encountering paleontological resources for excavations more than five feet in depth. The maximum depth of excavation for the proposed Project is eight feet below existing grade for general building construction and from 11 to 18 feet for sewer trenching. Cut portions of pad areas above buttresses or stabilizations would be over-excavated to a depth of three feet. Remedial grading would be performed in order to remove all of the undocumented fill soils and a portion of the near-surface native soils. Because earthwork activities beyond the depths of five feet would occur, the City typically applies conditions of approval to projects that disturb soil to ensure that that impacts to unknown paleontological resources would be less than significant. **Therefore, impacts to paleontological resources would be less than significant.**

(2) Mitigation Measures

Impacts to paleontological resources were determined to be less than significant without mitigation. Therefore, no mitigation measures would be required

(3) Level of Significance After Mitigation

Impacts regarding paleontological resources were determined to be less than significant without mitigation. Therefore, no mitigation measures were required or included, and the impact level remains less than significant.

4. Cumulative Impacts

(1) Impact Analysis

Geology and soils impacts, including impacts to paleontological resources, are site-specific and generally do not combine to result in cumulative impacts. Similar to the proposed Project, in the event that paleontological resources are uncovered, each future development project would be required to comply with regulatory requirements to ensure the proper treatment of such resources. **Therefore, no significant cumulative impact to paleontological resources would occur.**

(2) Mitigation Measures

Cumulative impacts to paleontological resources would be less than significant. Therefore, no mitigation measures are required.

(3) Level of Significance After Mitigation

Cumulative impacts to paleontological resources would be less than significant without mitigation. Therefore, no mitigation measures were required or included, and impacts remain less than significant.