



FINAL REPORT

PALEONTOLOGICAL RESOURCES IDENTIFICATION AND EVALUATION REPORT INTERSTATE 710 CORRIDOR PROJECT BETWEEN OCEAN BOULEVARD TO STATE ROUTE 60 07-LA-710-PM 4.9/24.9 EA 249900

Prepared for



Los Angeles County
Metropolitan Transportation Authority

October 2011

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EVALUATION REPORT**

FOR

INTERSTATE 710 CORRIDOR PROJECT

OCEAN BOULEVARD TO STATE ROUTE 60

COUNTY OF LOS ANGELES, CALIFORNIA

07-LA-710- PM 4.9/24.9 EA 249900

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LIST OF ACRONYMS AND ABBREVIATIONS

ACEC	Area of Critical Environmental Concern
ADI	Area of Direct Impact
APD	Area of Project Disturbance
BLM	(United States) Bureau of Land Management
Caltrans	California Department of Transportation
CCC	California Coastal Commission
CCR	California Code of Regulations
CDPR	California Department of Parks and Recreation
CEQA	California Environmental Quality Act
CERES	California Environmental Resources Evaluation System
ESA	Environmentally Sensitive Area
FHWA	Federal Highway Administration
FLPMA	Federal Land Policy and Management Act of 1976
FR	Federal Register
GCCOG	Gateway Cities Council of Governments
GP	general-purpose
I-5	Interstate 5
I-105	Interstate 105
I-405	Interstate 405
I-710	Interstate 705
ITS	Intelligent Transportation Systems
JPA	Joint Powers Authority
LACM	Natural History Museum of Los Angeles County
LPS	Locally Preferred Strategy
MCS	Major Corridor Study
Metro	Los Angeles County Metropolitan Transportation Authority
National Register	National Register of Historic Places
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act
NNL	National Natural Landmarks
NPS	National Park Service
PEAR	Preliminary Environmental Analysis Report
PER	Paleontological Evaluation Report
PIR	Paleontological Identification Report
PMP	Paleontological Mitigation Plan
PMR	Paleontological Mitigation Report
POLA	Port of Los Angeles
POLB	Port of Long Beach
PRC	Public Resources Code
PSS	Paleontological Stewardship Summary
RE	Resident Engineer
RTIP	Regional Transportation Improvement Program
SAFETEA-LU	Safe, Accountable, Flexible, and Efficient Transportation Equity Act: A Legacy for Users



SCAG	Southern California Association of Governments
SER	Standard Environmental Reference (Caltrans)
SMCRA	Surface Mining Control and Reclamation Act of 1977
SR-60	State Route 60
SR-91	State Route 91
SVP	Society of Vertebrate Paleontologists
TDM	Transportation Demand Management
TSM	Transportation Systems Management
USC	United States Code
USFS	United States Forest Service
USGS	United States Geological Survey
YBP	years before the present



SUMMARY OF FINDINGS

The California Department of Transportation (Caltrans), in cooperation with the Los Angeles County Metropolitan Transportation Authority (Metro), the Gateway Cities Council of Governments (GCCOG), the Southern California Association of Governments (SCAG), the Ports of Los Angeles (POLA) and Long Beach (POLB), and the Interstate 5 Joint Powers Authority (I-5 JPA), proposes to widen Interstate 710 (I-710) between Ocean Boulevard in the City of Long Beach north to State Route 60 (SR-60). Caltrans, Metro, GCCOG, SCAG, POLA, POLB, and the I-5 JPA are collectively referred to as the I-710 Funding Partners. These agencies are collectively funding the preparation of preliminary engineering and environmental documentation for the I-710 Corridor Project to evaluate improvements along the I-710 Corridor from Ocean Boulevard in the City of Long Beach to SR-60.

The existing I-710 mainline generally consists of eight general-purpose (GP) lanes north of Interstate 405 (I-405) and six GP lanes south of I-405. Five alternatives are under consideration for the I-710 Corridor Project. These are: Alternative 1, the No Build Alternative; Alternative 5A, which involves freeway widening of up to 10 GP lanes; Alternative 6A, which involves constructing 10 GP lanes plus a four-lane freight corridor (FC); Alternative 6B, which includes 10 GP lanes plus a zero-emissions four-lane FC, and Alternative 6C which includes 10 GP lanes plus a tolled four-lane FC. Alternatives 5A, 6A, 6B and 6C also include proposed improvements to 35 arterial highway intersections within the I-710 Corridor Project Study Area.

The area surveyed for this project is the Area of Project Disturbance (APD) for all areas of the I-710 Corridor Project where excavation is proposed. The APD is based on the horizontal and vertical extent of anticipated ground-disturbing activities and is comprised of approximately 1,977 acres. The APD includes all areas of proposed and existing right-of-way, utility relocations, lay-down areas, construction staging, and construction easements. Field pedestrian surveys were conducted from June through August 2009 and during May 2011.

Paleontological resources are fossils and are defined as any evidence of past life more than 10,000 years old. Paleontological resources are known to occur in rock units which underlie the proposed I-710 Corridor Project area. The APD contains seven types of sediment at the surface. Five of these, because of their young age (less than 10,000 years), do not have the potential to contain paleontological resources and include: artificial fill, recent alluvium, and landslide deposits. Two sediments from the Quaternary Period (1.8 million to 10,000 years ago) have the potential to contain paleontological remains and include: nonmarine terrace deposits and marine terrace deposits.



The I-710 Corridor Project involves potential excavation that could extend into deeper Pleistocene deposits. The locality search and literature review conducted for this project identified numerous Pleistocene localities from the immediate vicinity of the I-710 Corridor Project that were found during excavation into sediments that underlie these surficial deposits.

Recommendations from the California Environmental Quality Act (CEQA) and guidelines from Caltrans are consistent with the recommendations of the Society of Vertebrate Paleontology (SVP) and indicate that impacts to nonrenewable paleontological resources must be considered during project design and construction within sensitive sediments. The literature review and locality searches through museums and data maintained at LSA Associates, Inc. produced information showing that sediments dating from the Pleistocene Period within the APD have the potential to contain significant nonrenewable paleontological resources. Thus, it is likely that paleontological localities will be encountered during the project excavation phase of construction within these sediments.

This study reviews definitions of paleontological significance and definitions for rock units to have high potential and high sensitivity for the presence of nonrenewable paleontological resources.

To reduce impacts to nonrenewable paleontological resources, mitigation measures to avoid or minimize harm will be included in a Paleontological Mitigation Plan (PMP) for those portions of the I-710 Corridor Project that are identified as having a high paleontological sensitivity, which would follow the guidelines of Caltrans and recommendations from the SVP prior to completion of final project design. These recommendations include:

- A preconstruction field survey in areas identified as having high paleontological sensitivity after vegetation and paving have been removed, followed by salvage of any observed surface paleontological resources prior to the beginning of additional grading.
- Attendance at the pregrade meeting by a qualified paleontologist or representative. At this meeting, the paleontologist will explain the likelihood of encountering paleontological resources, what resources may be discovered, and the methods of recovery that will be employed.
- During construction excavation, a qualified vertebrate paleontological monitor shall initially be present on a full-time basis whenever excavation will occur within the sediments that have a high paleontological sensitivity rating and on a spot-check basis in sediments that have a low sensitivity rating. Monitoring may be reduced to a part-time basis if no resources are being discovered in sediments with a high



- sensitivity rating (monitoring reductions, when they occur, will be determined by the qualified Principal Paleontologist). The monitor shall inspect fresh cuts and/or spoils piles to recover paleontological resources. The monitor shall be empowered to temporarily divert construction equipment away from the immediate area of the discovery. The monitor shall be equipped to rapidly stabilize and remove fossils to avoid prolonged delays to construction schedules. If large mammal fossils or large concentrations of fossils are encountered, the appropriate equipment may be considered to assist in the removal and/or collection of large fossil materials. This equipment shall be secured from the construction contractor at their expense and be used only under the direction of the qualified Principal Paleontologist.
- Localized concentrations of small (or micro-) vertebrates may be found in all native sediments. Therefore, it is recommended that these sediments occasionally be spot-screened on site through one-eighth- to one-twentieth-inch mesh screens to determine whether microfossils are present. If microfossils are encountered, sediment samples (up to 3 cubic yards, or 6,000 pounds) shall be collected and processed through one-twentieth-inch mesh screens to recover additional fossils.
 - Recovered specimens shall be prepared to the point of identification and permanent preservation. This includes the sorting of any washed mass samples to recover small invertebrate and vertebrate fossils, the removal of surplus sediment from around larger specimens to reduce the volume of storage for the repository and storage cost, and the addition of approved chemical hardeners/stabilizers to fragile specimens.
 - Specimens shall be identified to the lowest taxonomic level possible and curated into an institutional repository with retrievable storage. The repository institutions usually charge a one-time fee based on volume, so removing surplus sediment is important. The repository institution may be a local museum or university with a curator who can retrieve the specimens on request. Caltrans requires that a draft curation agreement be in place with an approved curation facility prior to the initiation of any paleontological monitoring or mitigation activities.
 - Preparation and submittal of the Paleontological Mitigation Report (PMR) documenting completion of the PMP for the Lead Agency (Caltrans).

Implementation of these mitigation measures to avoid or minimize harm will reduce impacts to nonrenewable paleontological resources. More project-specific measures may be developed during preparation of the PMP to further reduce impacts during final project design.



1.0 INTRODUCTION

The California Department of Transportation (Caltrans), in cooperation with the Los Angeles County Metropolitan Transportation Authority (Metro), the Gateway Cities Council of Governments (GCCOG), the Southern California Association of Governments (SCAG), the Ports of Los Angeles (POLA) and Long Beach (POLB), and the Interstate 5 Joint Powers Authority (I-5 JPA), proposes to widen Interstate 710 (I-710) between Ocean Boulevard in the City of Long Beach north to State Route 60 (SR-60).

1.1 PROJECT LOCATION

The I-710 Corridor Project study area includes the portion of I-710 from Ocean Boulevard in Long Beach to SR-60, a distance of approximately 18 miles (see Figure 1). At the freeway-to-freeway interchanges, the study area extends one mile east and west of I-710 for the Interstate 405 (I-405), State Route 91 (SR-91), Interstate 105 (I-105), and I-5 interchanges. The I-710 Corridor Project also includes the major north/south arterials from Wilmington Avenue to the west to Lakewood Boulevard to the east. The I-710 Corridor Project traverses portions of the cities of Bell, Bell Gardens, Carson, Commerce, Compton, Cudahy, Downey, Huntington Park, Lakewood, Long Beach, Los Angeles, Lynwood, Maywood, Paramount, Signal Hill, South Gate, and Vernon, all within Los Angeles County, California. Specifically, the linear project extends from a terminus at 33° 45' 53.69"N Latitude by 118° 12' 5.33" W Longitude (an unsectioned portion of T5S, R13W) north to 34° 01' 49.07"N Latitude by 118° 10' 16.66" W Longitude (an unsectioned portion of T2S, R12W). Large portions of the I-710 Corridor Project are not within the Public Land Survey System, so specific section information is lacking. The I-710 Corridor Project study area is depicted on the *Long Beach, South Gate, and Los Angeles, California* 7.5-minute series United States Geological Survey (USGS) topographic maps (Figure 2).

The I-710 Corridor Project alternatives encompass a large area that passes through urban settings consisting of residential, industrialized warehouse, and commercial business uses. The I-710 Corridor roughly parallels the course of the Los Angeles River from the southern terminus of the I-710 Corridor Project to the area where Atlantic Boulevard crosses the I-710 mainline.

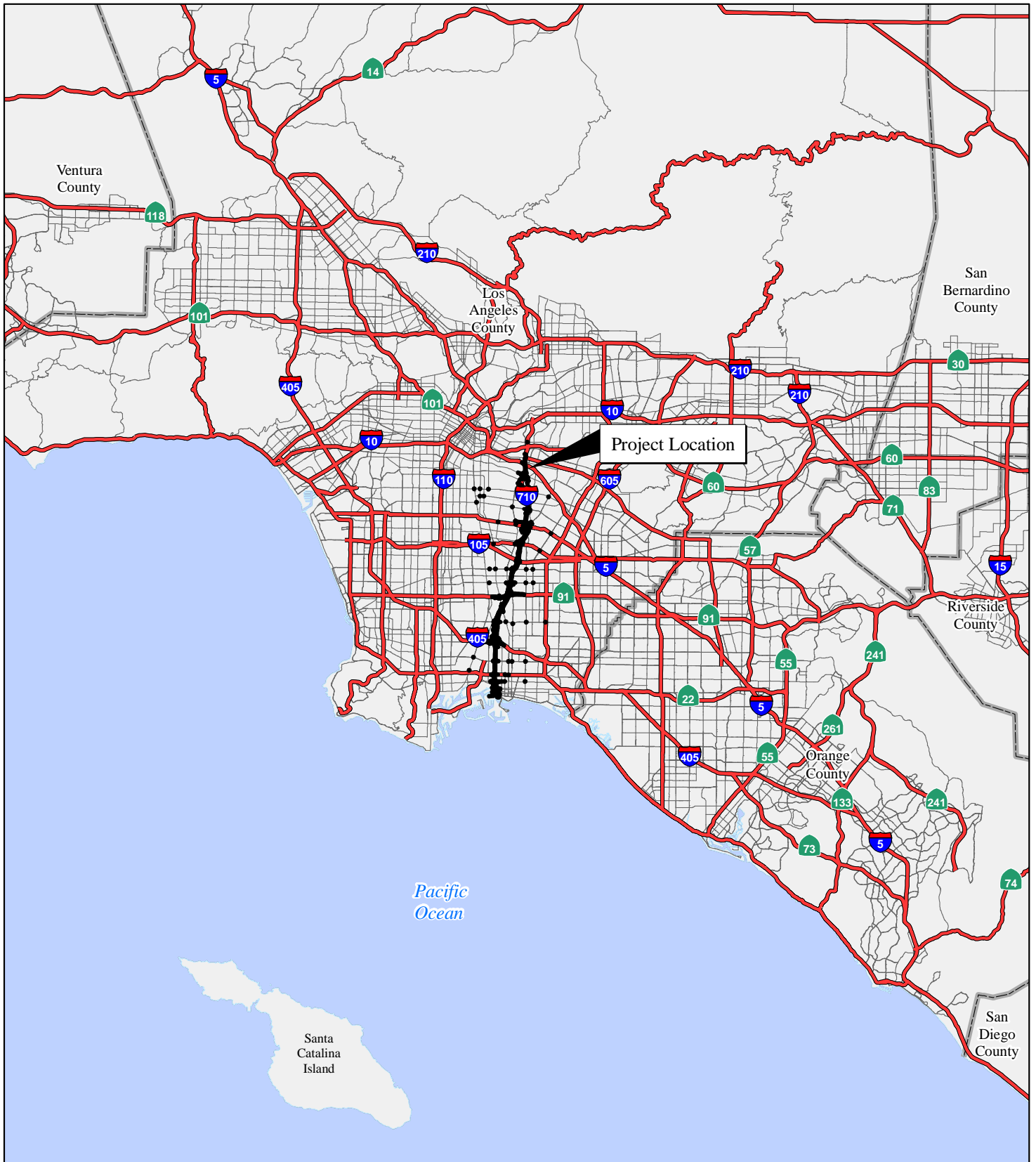
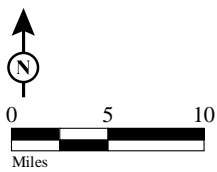


FIGURE 1

LEGEND

 Project Location



SOURCE: TBM (2008)

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I-710 Corridor Project
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Project Vicinity Map

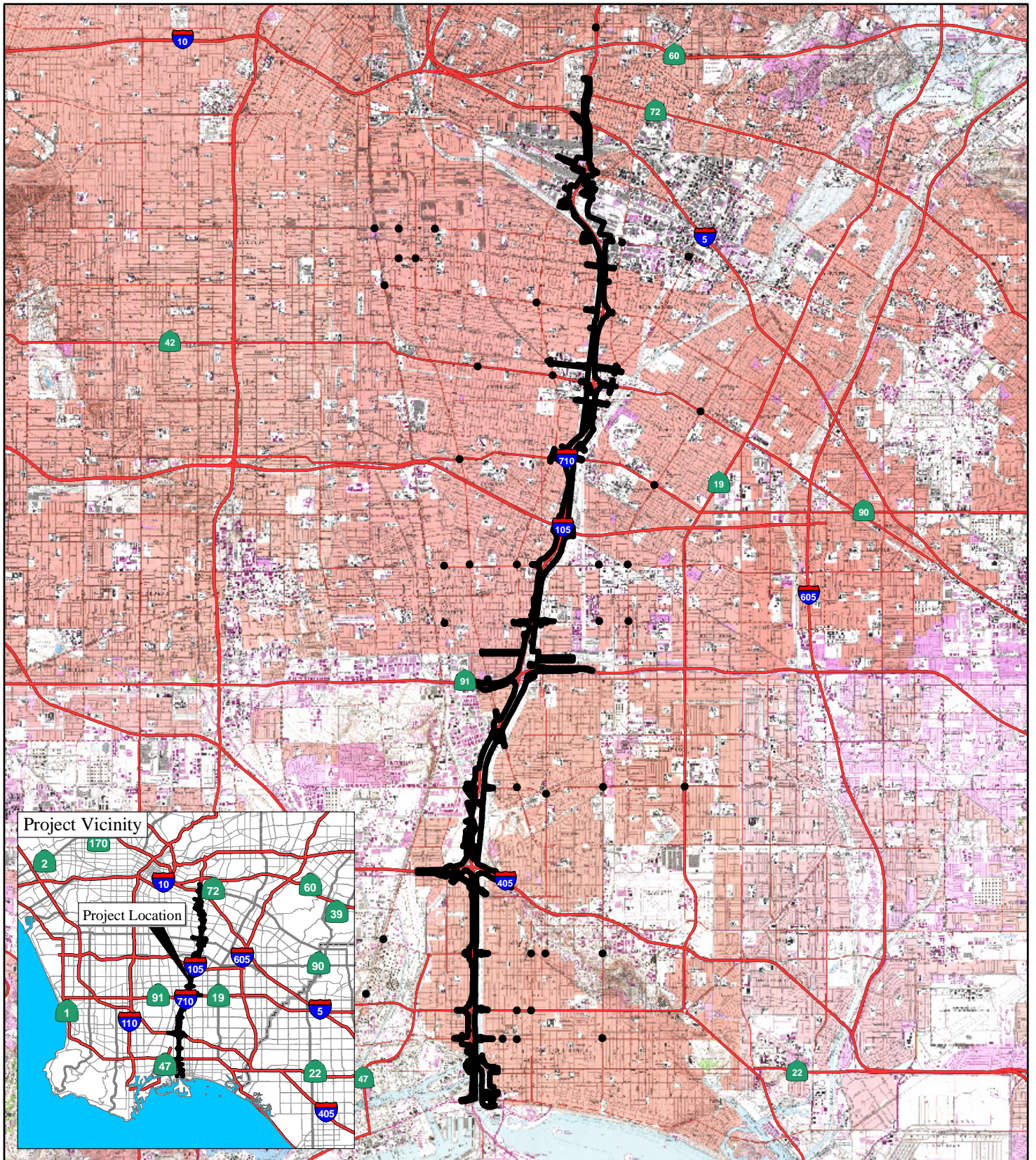




FIGURE 2

LEGEND

-  Project Limits
-  Arterial Intersection Improvements



SOURCE: USGS 7.5' Quad. LONG BEACH (81), SOUTH GATE (81), LOS ANGELES (81)
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I-710 Corridor Project
 07-LA-710- PM 4.9/24.9 EA 249900
 Project Location Map



1.2 ALTERNATIVES DESCRIPTION

This section describes the alternatives based on the Major Corridor Study that were developed by a multidisciplinary technical team to achieve the I-710 Corridor Project purpose and subsequently were reviewed and concurred upon by the various committees involved in the I-710 Corridor Project community participation framework. Alternatives 2, 3, and 4 were considered but withdrawn from further environmental study as stand-alone alternatives but elements of these alternatives have been included in Build Alternatives 5A, 6A, 6B, and 6C. The alternatives are Alternative 1 (No Build Alternative), Alternative 5A (I-710 Widening up to 10 General Purpose [GP] Lanes), Alternative 6A (10 GP Lanes plus a Four-Lane Freight Corridor), Alternative 6B (10 GP Lanes plus a Zero-Emissions Four-Lane Freight Corridor), and Alternative 6C (10 GP Lanes plus a Four-Lane Freight Corridor Tolled).

1.3 ALTERNATIVE 1 – NO BUILD ALTERNATIVE

The No Build Alternative does not include any improvements within the I-710 Corridor other than those projects that are already planned and committed to be constructed by or before the planning horizon year of 2035. The projects included in this alternative are based on Southern California Association of Governments (SCAG's) 2008 Regional Transportation Improvement Program (RTIP) project list, including freeway, arterial, and transit improvements within the SCAG region. This alternative also assumes that goods movement to and from the ports make maximum utilization of existing and planned railroad capacity within the I-710 Corridor. Alternative 1 is the baseline against which the Build Alternatives proposed for the I-710 Corridor Project will be assessed. The existing I-710 mainline generally consists of eight GP lanes north of I-405 and six GP lanes south of I-405.

1.4 ALTERNATIVE 5A – FREEWAY WIDENING UP TO 10 GP LANES

Alternative 5A proposes to widen the I-710 mainline to up to ten GP lanes (northbound [NB] I-710 and southbound [SB] I-710). This alternative will:

- Provide an updated design at the I-405 and State Route 91 (SR-91) interchanges (no improvements to the I-710/Interstate 5 [I-5] interchange are proposed under Alternative 5A)
- Reconfigure all local arterial interchanges within the project limits that may include realignment of on- and off-ramps, widening of on- and off-ramps, and reconfiguration of interchange geometry



- Eliminate local ramp connections over I-710 (9th to 6th St. and 7th to 10th St.) in the City of Long Beach
- Eliminate a local interchange at Wardlow Ave. in the City of Long Beach
- Add a local street connection under I-710 to Thunderbird Villas at Miller Way in the City of South Gate
- Add a local connection (bridge) over I-710 at Southern Ave. in the City of South Gate
- Add a local arterial interchange at NB and SB I-710/Slauson Ave. in the City of Maywood
- Shift the I-710 centerline at several locations to reduce right-of-way requirements.

Additionally, various structures such as freeway connectors, ramps, and local arterial overcrossings, structures over the Los Angeles River and structures over the two railyards throughout the project limits will be replaced, widened, or added as part of Alternative 5A.

In addition to improvements to the I-710 mainline and the interchanges, Alternative 5A also includes Transportation Systems/Transportation Demand Management (TSM/TDM), Transit, and Intelligent Transportation Systems (ITS) improvements. TSM improvements include provision of or future provision of ramp metering at all locations and the addition of improved arterial signage for access to I-710. Parking restrictions during peak periods (7:00 a.m.–9:00 a.m.; 4:00 p.m.–7:00 p.m.) will be implemented on four arterial roadways: Atlantic Blvd. between Pacific Coast Hwy. and SR-60; Cherry Ave./Garfield Ave. between Pacific Coast Hwy. and SR-60; Eastern Ave. between Cherry Ave. and Atlantic Blvd.; and Long Beach Blvd. between San Antonio Dr. and Firestone Blvd. Transit improvements that will be provided as part of the I-710 Corridor Project include increased service on all Metro Rapid routes and local bus routes in the study area. ITS improvements include updated fiber-optic communications to interconnect traffic signals along major arterial streets to provide for continuous, real-time adjustment of signal timing to improve traffic flow as well as other technology improvements.

Alternative 5A also includes improvements to 35 local arterial intersections within the I-710 Corridor Project study area (see Figure 2). These improvements generally consist of lane restriping or minimal widening to provide additional intersection turn lanes that will reduce traffic delay and improve intersection operations for those intersections with projected Level of Service (LOS) F.



In addition to the transportation system improvements described above, Alternative 5A also includes:

- **Aesthetic Enhancements:** Landscaping and irrigation systems would be provided within the corridor where feasible. Urban design and aesthetic treatment concepts for community enhancement will be integrated into the design of the I-710 Corridor Project. These concepts will highlight unique community identities within a unified overall corridor theme; strengthen physical connections and access/mobility within and between communities; and implement new technologies and best practices to ensure maximum respect for the environment and natural resources. They will continue to evolve and be refined through future phases of project development.
- **Drainage/Water Quality Features:** Alternative 5A includes modifications to the Los Angeles River levee; new, extended, replacement, and additional bents and pier walls in the Los Angeles River; additional and extended bents and pier walls in the Compton Channel; modifications to existing pump stations or provision of additional pump stations; and detention basins and bioswales that will provide for treatment of surface water runoff prior to discharge into the storm drain system.

1.5 ALTERNATIVE 6A – 10 GP LANES PLUS A FOUR-LANE FREIGHT CORRIDOR

Alternative 6A includes all the components of Alternatives 1 and 5A described above. (The alignment of the GP lanes in Alternative 6A will be slightly different than Alternative 5A in a few locations.) In addition, this alternative includes a separated four-lane freight corridor (FC) from Ocean Blvd. northerly to its terminus near the UP and BNSF railyards in the City of Commerce. The FC would be built to Caltrans highway design standards and would be restricted to the exclusive use of heavy-duty trucks (5+ axles). In Alternative 6A these trucks are assumed to be “conventional” trucks (conventional trucks are defined to be newer [post-2007] diesel/fossil-fueled trucks [new or retrofitted engines required per new regulations and standards]).

The FC would be both at-grade and on elevated structure with two lanes in each direction. There are exclusive, truck only ingress and egress ramps to and/or from the FC at the following locations:

- Harbor Scenic Dr. (NB ingress only)
- Ocean Blvd. (NB ingress only)
- Pico Ave. (NB ingress and SB egress only)



- Anaheim St. (NB ingress and SB egress only)
- SB I-710 GP lanes just south of Pacific Coast Hwy (SB egress only)
- NB I-710 GP lanes north of I-405 at 208th St. (NB ingress only)
- SB I-710 GP lanes north of I-405 at 208th St. (SB egress only)
- Eastbound (EB) SR-91 (NB egress only)
- Westbound (WB) SR-91 (SB ingress only)
- Patata St (NB egress and SB ingress only)
- SB I-710 GP lanes at Bandini Blvd. (SB ingress only)
- NB I-710 GP lanes at Bandini Blvd. (NB egress only)
- Washington Blvd. – (NB egress ~~only~~ and SB ingress only) (Design Options 1 and 2)
- Washington Blvd. (NB egress and SB ingress via Indiana Ave) (Design Option 3)
- Sheila St – (NB egress only) (Design Option 3)

In addition to the FC feature, Alternative 6A includes:

- Partial modification to the I-5 interchange, notably the replacement of the NB I-710 to NB I-5 connector (right-side ramp replacement of left-side ramp) and a realigned SB I-5 to SB I-710 connector and 5 SB GP lanes from SR-60 to Washington Blvd.
- 3 NB GP lanes from I-5 to SR-60
- Retention of and modification to the I-710 SB on- and off-ramps at Eastern Ave. to slightly realign them.
- A local connection over I-710 at Patata St. in the cities of South Gate and Bell Gardens.

As with Alternative 5A, Alternative 6A will include additional aesthetic enhancements, and drainage/water quality features as follows:



Aesthetic Enhancements: In addition to the aesthetic enhancements described above for Alternative 5A, specific aesthetic treatments will be developed for the FC, including use of screen walls and masonry treatments on the FC structures (including soundwalls).

Drainage/water quality features: Alternative 6A includes features to capture and treat the additional surface water runoff from the FC, as well as some modifications to the Los Angeles River levees in order to accommodate electrical transmission line relocations.

1.6 ALTERNATIVE 6B – 10 GP LANES PLUS A ZERO-EMISSIONS FOUR-LANE FREIGHT CORRIDOR

Alternative 6B includes all the components of Alternative 6A as described above, but would restrict the use of the FC to zero-emission trucks rather than conventional trucks. This proposed zero emission truck technology is assumed to consist of trucks powered by electric motors in lieu of internal combustion engines and producing zero tailpipe emissions while traveling on the freight corridor. The specific type of electric motor is not defined, but feasible options include linear induction motors, linear synchronous motors or battery technology. The power systems for these electric propulsion trucks could include, but is not limited to, hybrid with dual-mode operation (ZEV Mode), Range Extender EV (Fuel Cell or Turbine with ZEV mode), Full EV (with fast charging or infrastructure power), road-connected power (e.g., overhead catenary electric power distribution system), alternative fuel hybrids, zero NO_x dedicated fuel engines (CNG, RNG, H₂ ICE), and range extender EV (turbine). For purposes of the I-710 environmental studies, the zero-emission electric trucks are assumed to receive electric power while traveling along the FC via an overhead catenary electric power distribution system (road-connected power).

Alternative 6B also includes the assumption that all trucks using the FC will have an automated control system that will steer, brake, and accelerate the trucks under computer control while traveling on the FC. This will safely allow for trucks to travel in “platoons” (e.g., groups of 6–8 trucks) and increase the capacity of the FC from a nominal 2,350 passenger car equivalents per lane per hour (pces/l_n/hr) (as defined in Alternative 6A) to 3,000 pces/l_n/hr in Alternative 6B.

The design of the FC will also allow for possible future conversion, or be initially constructed, as feasible (which may require additional environmental analysis and approval), of a fixed-track guideway family of alternative freight transport technologies (e.g., Maglev). However, this fixed-track family of technologies has been screened out of this analysis for now, as they have been determined to be inferior to electric trucks in terms of cost and ability to readily serve the multitude of freight origins and destinations served by trucks using the I-710 corridor.



1.7 ALTERNATIVE 6C – 10 GP LANES PLUS A FOUR-LANE FREIGHT CORRIDOR WITH TOLLS

Alternative 6C includes all the components of Alternative 6B as described above, but would toll trucks using the FC. Although tolling trucks in the FC could be done under either Alternative 6A or 6B; for analytical purposes, tolling has only been evaluated for Alternative 6B as this alternative provides for higher FC capacity than Alternative 6A due to the automated guidance feature of Alternative 6B.

Tolls would be collected using electronic transponders which would require overhead sign bridges and transponder readers like the SR-91 toll lanes currently operating in Orange County, where no cash toll lanes are provided. The toll pricing structure would provide for collection of higher tolls during peak travel periods.

1.8 DESIGN OPTIONS

For alternatives 6A, 6B, and 6C, three design options for the portion of I-710 between the I-710/Slauson Ave interchange to just south of the I-710/I-5 interchange are under consideration. These configurations will be fully analyzed so that they can be considered in the future selection of a Preferred Alternative for the project. These options are as follows:

1.8.1 Design Option 1

Design Option 1 applies to Alternatives 6A, 6B and 6C and provides access to Washington Blvd using three ramp intersections at Washington Blvd.

1.8.2 Design Option 2

Design Option 2 applies to Alternatives 6A, 6B, and 6C and provides access to Washington Blvd. using two ramp intersections at Washington Blvd.

1.8.3 Design Option 3

Design Option 3 applies only to Alternative 6B¹ and removes access to Washington Blvd. at its current location. The ramps at the I-710/Washington Blvd. interchange would be removed to accommodate the proposed FC ramps in and out of the railyards. The SB off-ramp and NB-on-ramp access would be accommodated by Alternative 6B in the vicinity of the existing interchange by the proposed new SB off-ramp and NB on-ramp at Oak St. and Indiana St. These two ramps are proposed as mixed-flow ramps (freight connector ramps that would also allow automobile traffic). However, the SB on-ramp and NB off-ramp traffic that previously used the Washington Blvd. interchange would be required to access the Atlantic

¹ Design Option 3 only applies to Alternative 6B because it was not included in the travel demand modeling for either Alternative 6A or 6C.



Blvd./Bandini Blvd. interchange located south of the existing Washington Blvd. interchange to ultimately reach I-710.

1.9 PURPOSE OF INVESTIGATION

Significant nonrenewable paleontological resources, including vertebrate fossils and unique or scientifically important invertebrate fossils and remains of fossil plants, are recognized by the State of California and NEPA (Appendix A). These regulations require that adverse effects to paleontological resources be avoided, or—if they cannot be avoided—mitigated to the extent feasible. NEPA does not specifically direct federal agencies to preserve paleontological resources, but preserving “important historic, cultural, and natural aspects of our natural heritage” [Section 101(b)(4)] is interpreted to include fossils.

The paleontological records search and field assessment for the I-710 Corridor Project were conducted pursuant to CEQA, Public Resources Code (PRC) 21000 (Division 13), California Code of Regulations (CCR) 15000 (Title 14, Division 3, Chapter 1), CEQA Appendix G, and PRC 5097.5. This assessment documents the potential for paleontological resources older than 10,000 years to occur within each basin location. According to the Caltrans Standard Environmental Reference (SER) Volume 1, Chapter 8,² the usual approach to addressing project-related paleontological resources involves identification, evaluation, and, if necessary, mitigation. These three steps generally entail preparation of several documents that include (1) a Paleontological Identification Report (PIR); (2) a Paleontological Evaluation Report (PER); and, if a potential for encountering significant resources is determined, (3) a Paleontological Mitigation Plan (PMP). At the conclusion of grading, two additional documents may need to be prepared: a Paleontological Mitigation Report (PMR) and a Paleontological Stewardship Summary (PSS).

The paleontological resources assessment was also prepared in accordance with guidelines on a national level, including those from NEPA (P.L. 91–190, 83 Stat. 852, 42 USC 4321–4327), the Federal Land Policy and Management Act of 1976 (FLPMA, P.L. 94–579, 43 USC 1701–1782), and the *Paleontological Resource Management 1998 Bureau of Land Management (BLM) Handbook H-8270-1*.

1.9.1 Caltrans Requirements

As portions of this project are within a State highway right-of-way, the project is obligated to follow the guidelines specified in the Caltrans Standard Environmental Reference (SER). Specifically, the SER Environmental Handbook, Volume 1 Chapter 8, deals with paleontology. The guidelines are designed to address impacts to paleontological resources prior to the beginning of construction. In most cases, three documents are required to be

² Available on the Web at <http://www.dot.ca.gov/ser/vol1/sec3/physical/Ch08Paleo/chap08paleo.htm>.



prepared: a Paleontological Investigation Report (PIR), a Paleontological Evaluation Report (PER), and a PMP. The PIR and PER are often combined into a single document. The PIR and PER must be prepared prior to completion of the Project Approval/Environmental Document (PA/ED) phase in order to minimize construction delays. The PMP must be developed prior to the beginning of construction.

The purpose of the PIR is to identify whether or not paleontological resources may be present within the project area; the purpose of the PER is to evaluate the significance of the resources, if it is determined that resources are likely to be present; and the purpose of the PMP is to develop mitigation for significant resources. Occasionally the PIR/PER will determine that, despite the results of the literature search, it is unlikely that the project will encounter significant resources during construction. This may be due to the removal of sensitive sediments as a result of previous construction in the area, or to the burying of sensitive sediments with fill deeper than depths that will be encountered during construction related to the project. In these cases, a PMP will not be required, and the reason will be specified in the PIR/PER. At the conclusion of grading, two additional documents may need to be prepared: a PMR and a Paleontological Stewardship Summary (PSS).

1.9.2 State Regulations

Under State law, paleontological resources are protected by both CEQA and PRC Section 5097.5.

Under CEQA, Appendix G, Lead Agencies are required to consider impacts to the direct or indirect destruction of unique resources that are of value to the region or State. Appendix G is a checklist with several choices given, including: Potentially Significant Impact, Less than Significant with Mitigation Incorporation, Less than Significant Impact, and No Impact. Specifically, in Appendix G, Section V(c), Lead Agencies are required to consider impacts to paleontological resources.

California PRC Section 5097.5 states:

“(a) No person shall knowingly and willfully excavate upon, or remove, destroy, injure or deface any historic or prehistoric ruins, burial grounds, archaeological or vertebrate paleontological site, including fossilized footprints, inscriptions made by human agency, or any other archaeological, paleontological or historical feature, situated on public lands, except with the express permission of the public agency having jurisdiction over such lands. Violation of this section is a misdemeanor.



(b) As used in this section, “public lands” means lands owned by, or under the jurisdiction of, the state, or any city, county, district, authority, or public corporation, or any agency thereof.”

1.10 SIGNIFICANCE

1.10.1 Definitions of Significance

The SVP (1995) provides the following definitions of significance.

- **Significant Nonrenewable Paleontological Resources** are fossils and fossiliferous deposits, here restricted to vertebrate fossils and their taphonomic and associated environmental indicators. This definition excludes invertebrate and botanic fossils except when present within a given vertebrate assemblage. Certain plant and invertebrate fossils or assemblages may be defined as significant by a project paleontologist, local paleontologist, specialist, special-interest group, Lead Agency, or local government.
- A **Significant Fossiliferous Deposit** is a rock unit or formation that contains significant nonrenewable paleontological resources, here defined as comprising one or more identifiable vertebrate fossils, large or small, and any associated invertebrate and plant fossils, traces, or other data that provide taphonomic, taxonomic, phylogenetic, ecologic, and stratigraphic information (ichnites and trace fossils generated by vertebrate animals [e.g., trackways or nests and middens], which provide datable material and climatic information). Paleontological resources are considered to be older than recorded history and/or older than 5,000 years before the present (YBP).

According to Caltrans, the significance of a paleontological resource may be stated for a particular fossil species, fossil assemblage, or a rock unit as a whole. There are two generally recognized types of paleontological significance:

- **National.** A National-Natural-Landmark-eligible paleontological resource is an area of national significance (as defined under 36 CFR 62) that contains an outstanding example of fossil evidence of the development of life on earth. This is the only codified definition of paleontological significance.
- **Scientific.** Definitions of a scientifically significant paleontological resource can vary by jurisdictional agency and paleontological practitioner.

Generally, scientifically significant paleontological resources are identified sites or geological deposits containing individual fossils or assemblages of fossils that are unique or unusual;



are diagnostically or stratigraphically important; and add to the existing body of knowledge in specific areas stratigraphically, taxonomically, or regionally (SVP, 1995). Particularly important are fossils found *in situ* (undisturbed) in primary context (i.e., fossils that have not been subjected to disturbance subsequent to their burial and fossilization). As such, they aid in stratigraphic correlation, particularly those offering data for the interpretation of tectonic events, geomorphologic evolution, paleoclimatology, the relationships between aquatic and terrestrial species, and evolution in general. Discovery of *in situ* fossil-bearing deposits is rare for many species, especially vertebrates. Vertebrate fossils are often assigned greater significance than other fossils because they are rarer than other types of fossils. This is primarily due to the fact that the best conditions for fossil preservation include little or no disturbance after death and quick burial in oxygen-depleted, fine-grained sediments. While these conditions often exist in marine settings, they are relatively rare in terrestrial settings. This has ramifications on the amount of scientific study needed to adequately characterize an individual species and therefore affects how relative sensitivities are assigned to formations and rock units.

1.10.2 Summary of Significance

This document uses an abbreviated summary defining the significance of paleontological resources: all vertebrate fossils that can be related to a stratigraphic context are significant and are considered significant nonrenewable paleontological resources. Invertebrate and plant fossils, as well as other environmental indicators associated with vertebrate fossils, are considered significant. Certain invertebrate and plant fossils that are regionally rare or uncommon, or that help to define stratigraphy, age, or taxonomic relationships, are considered significant.

1.11 SENSITIVITY

1.11.1 Definition of Sensitivity

- Significance is often stated as “sensitivity” or “potential,” since decisions about how to manage paleontological resources must be based on “potential” because the actual situation cannot be known until construction excavation for the project is underway. In accordance with the Caltrans SER guide for paleontology (Caltrans, 2011), the sensitivity of rock units and formations that may contain paleontological resources is assessed on the basis of high, low, or no potential for paleontological resources:
- **High Potential.** Rock units which, based on previous studies, contain or are likely to contain significant vertebrate, significant invertebrate, or significant plant fossils. These units include, but are not limited to, sedimentary formations that contain significant nonrenewable paleontological resources



anywhere within their geographical extent, and sedimentary rock units temporally or lithologically suitable for the preservation of fossils. These units may also include some volcanic and low-grade metamorphic rock units. Fossiliferous deposits with very limited geographic extent or an uncommon origin (e.g., tar pits and caves) are given special consideration and ranked as highly sensitive. High sensitivity includes the potential for containing (1) abundant vertebrate fossils; (2) a few significant fossils (large or small vertebrate, invertebrate, or plant fossils) that may provide new and significant taxonomic, phylogenetic, ecologic, and/or stratigraphic data; (3) areas that may contain datable organic remains older than Recent, including *Neotoma* (sp.) middens; and/or (4) areas that may contain unique new vertebrate deposits, traces, and/or trackways. Areas with a high potential for containing significant paleontological resources require monitoring and mitigation.

- **Low Potential.** This category includes sedimentary rock units that (1) are potentially fossiliferous, but have not yielded significant fossils in the past; (2) have not yet yielded fossils, but possess a potential for containing fossil remains; or (3) contain common and/or widespread invertebrate fossils if the taxonomy, phylogeny, and ecology of the species contained in the rock are well understood. Sedimentary rocks expected to contain vertebrate fossils are not placed in this category because vertebrates are generally rare and found in more localized stratum. Rock units designated as low potential generally do not require monitoring and mitigation. However, as excavation for construction gets underway, it is possible that new and unanticipated paleontological resources might be encountered. If this occurs, a Construction Change Order (CCO) must be prepared in order to have a qualified Principal Paleontologist evaluate the resource. If the resource is determined to be significant, monitoring and mitigation is required.
- **No Potential.** Rock units of intrusive igneous origin, most extrusive igneous rocks, and moderately to highly metamorphosed rocks are classified as having no potential for containing significant paleontological resources. For projects encountering only these types of rock units, paleontological resources can generally be eliminated as a concern when the Preliminary Environmental Analysis Report (PEAR) is prepared and no further action taken.

Given the range of criteria that may be used, paleontological significance assessments should necessarily be based on the recommendations of a professional Principal Paleontologist with expertise in the region under study and the resources found in that



region. An evaluation of a particular rock unit's significance rests on the known importance of specific fossils. Often this significance is reflected as a sensitivity ranking relative to other rock units in the same region. Regardless of the format used by a paleontologist to rank formations, the importance of any rock unit must be explicitly stated in terms of specific fossils known or suspected to be present (and, if the latter, why such fossils are suspected), and why these fossils are of paleontological importance. Some land management agencies may require the use of specific guidelines to assess significance, whereas others may defer to the expertise of local paleontologists and provide little guidance.

If a paleontological resource is determined to be significant, of high sensitivity, or of scientific importance, a mitigation program must be developed and implemented. Mitigation can be initiated prior to and/or during construction. The latter is more common for Caltrans projects. It should be pointed out that mitigation during construction poses a greater risk of construction delays. Mitigation is an eligible federal project cost, in accordance with 23 USC 305, only if significance documentation acceptable to the Federal Highway Administration (FHWA) is submitted. Thus, coordination between Caltrans, FHWA, and all jurisdictional agencies is critical to formally establishing the significance of a resource. Any needed coordination on Caltrans projects is usually completed and included as part of the PMP.

As a practical matter, no consideration is generally afforded to paleontological sites for which scientific importance cannot be demonstrated. If a paleontological resource assessment results in a determination that the site is insignificant or of low sensitivity, it is recommended that this conclusion be documented in a PER and in the project's environmental document in order to demonstrate compliance with applicable statutory requirements.

1.11.2 Summary of Sensitivity

This document uses the following abbreviated summary to define paleontological sensitivity and the potential for significant paleontological resources:

A formation or rock unit has paleontological sensitivity or the potential for significant paleontological resources if it has previously produced or has lithologies conducive to the preservation of vertebrate fossils and associated or regionally uncommon invertebrate and plant fossils. All sedimentary rocks and certain extrusive volcanic rocks and mildly metamorphosed rocks are considered to have potential for paleontological resources.



2.0 METHODS

To ensure that research was comprehensive, the I-710 Corridor Project Area of Project Disturbance (APD) was expanded to include an area up to 100 feet beyond the I-710 Corridor Project limits shown on Figure 2. Prior to the field survey, research was conducted to locate fossil localities within the APD and project vicinity as well as sediments and formations conducive to the preservation of paleontological resources. This research involved review of available geological and paleontological literature concerning or related to the stratigraphy of the I-710 Corridor Project area, requests for paleontological locality data from southern California museums, and requests for locality data from paleontologists and geologists who have conducted research in the vicinity of I-710. The pedestrian survey was limited to areas within the I-710 Corridor Project footprint where surficial geological exposures were present. During May 2011, additional work was done verifying that the entire project area was included within the APD and examining project area geology to ensure that no new fossiliferous formations were being encountered through project design refinements.

2.1 KEY PERSONNEL

Steven W. Conkling, Principal Paleontologist and County of Orange Certified Paleontologist, completed the paleontological resource literature review and report preparation. Mr. Conkling (Appendix C) has 16 years of experience with paleontological salvage programs and has extensive experience collecting paleontological resources as well as writing paleontological assessment reports; surveying for paleontological resources; salvaging large fossil specimens; performing fossil identification and curation; and preparing final mitigation monitoring reports at the conclusion of construction projects. He is a research associate or a member of several local museums and scientific societies, including the Orange County Natural History Museum, Los Angeles County Museum of Natural History (LACM), San Bernardino County Museum, Mojave Desert Quaternary Research Society, and SVP.

2.2 LITERATURE REVIEW AND RECORDS SEARCH

A paleontological literature review was conducted for the I-710 Corridor Project using unpublished reports, paleontological assessment and monitoring reports, field notes, published literature, and maps. A paleontological resource records search was conducted through the LACM. Paleontological resource locality forms housed in these institutions record fossil localities in sediments equivalent in age to these on the proposed project. As geologic formations and units can be exposed over large geographic areas but contain



similar lithologies and fossils, the literature review and fossil locality search includes areas well beyond the APD.

The purpose of the locality search was to establish the status and extent of previously recorded paleontological resources within and adjacent to the I-710 Corridor Project APD. With this knowledge, an informed assessment of the potential effects of the I-710 Corridor Project on paleontological resources could be made, and the types of fossils that might be uncovered during ground-disturbing activities could be evaluated. In addition, the sensitivity of the sediments expected to be encountered during construction could be determined.

2.3 FIELD INSPECTION

2.3.1 Pedestrian Survey

A pedestrian survey of the I-710 Corridor Project APD was conducted by Paleontologist Steven W. Conkling from June 16 through August 21, 2009. Additional work to address design refinements was conducted during May 2011. During the surveys, bedrock exposures along the I-710 Corridor were examined to identify exposures of fossiliferous sediments. Intuitive deviations from the APD were taken to examine nearby bedrock exposures. The purpose of this survey was to confirm the accuracy of the geologic mapping and to identify whether any paleontological resources might be exposed on the surface.



3.0 RESULTS

3.1 LOCALITY SEARCH

3.1.1 Geology

The I-710 Corridor Project is located at the northern end of the Peninsular Range geomorphic province, a 900-mile-long northwest-southeast-trending structural block that extends from the tip of Baja California to the Transverse Ranges and includes the Los Angeles Basin (Norris and Webb, 1976). The total width of the province is approximately 225 miles, with a maximum landbound width of 65 miles (Sharp, 1976). It contains extensive pre-Cretaceous (more than 65 million years ago) igneous and metamorphic rocks covered by limited exposures of post-Cretaceous sedimentary deposits.

Specifically, the I-710 Corridor Project runs along the course of the Los Angeles River, crossing the Los Angeles Basin from north to south. The APD is typified by a low-lying topography with slight hills or mesas rising above the basin floor. The Los Angeles Basin is a broad, almost level alluvial plain (gradient of 0.5 to 1 percent). It is bounded on the north and northeast by hills and mountains of the Northern Peninsular and Transverse Ranges and on the south and west by the Pacific Ocean. The Los Angeles Basin is divided into several areas. The Downey Plain, in which the project lies, is the largest section and is located in the central portion of the Los Angeles Basin.

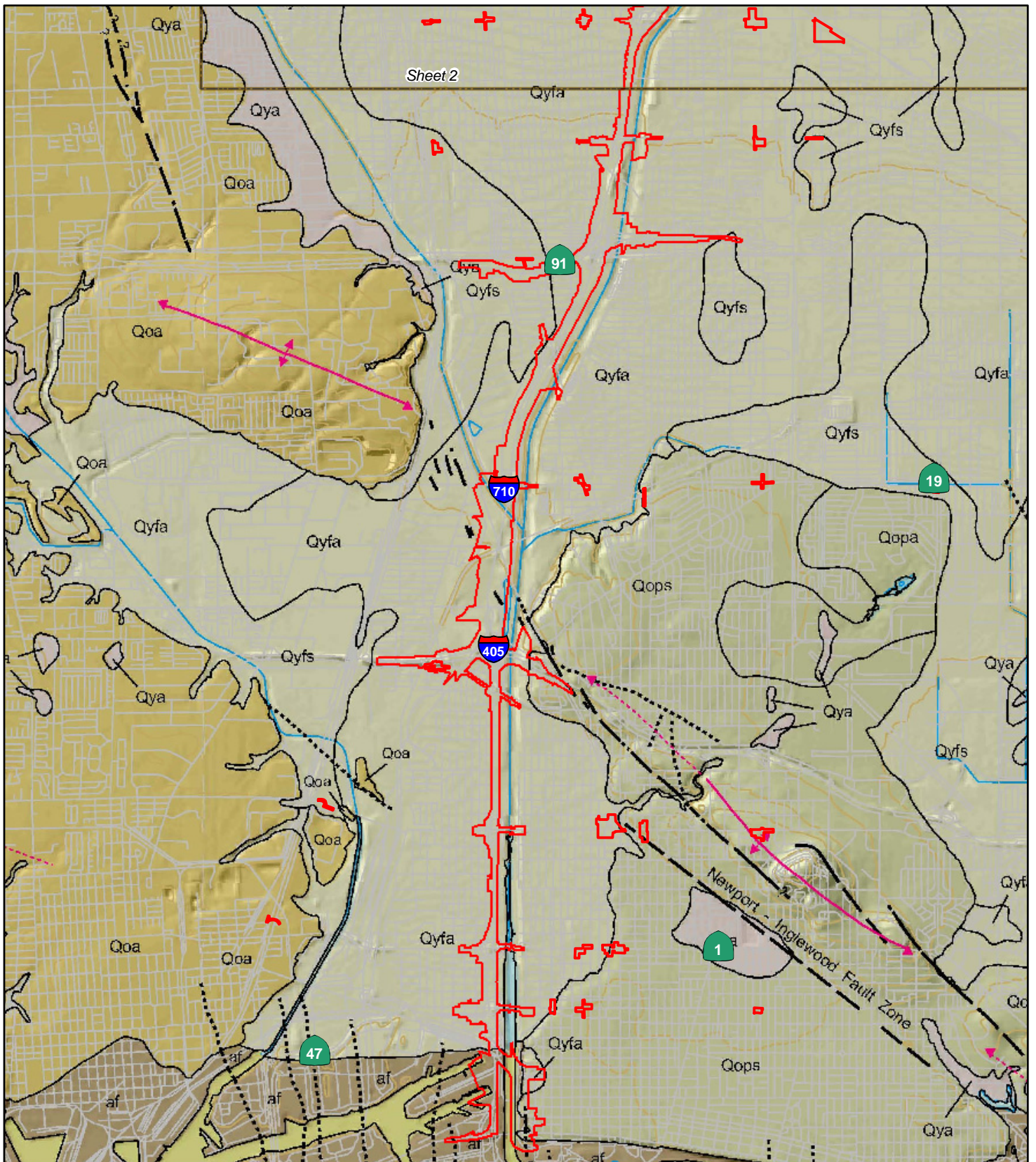
Geologic mapping (Morton and Miller, 2006 and Morton, 2004) indicates that sediments from the latest Quaternary are mapped as occurring within the APD (Figure 3). Table A lists the ages for the formations and units exposed within the study area. These units are described in more detail in the following pages.

Table A Geologic Time Periods and Geologic Units within the I-710 Corridor APD

Epoch	Age (years ago)	Geologic Formation/Unit	Map Symbol
Quaternary Period			
Holocene	Less than 100	Artificial Fill	af
Holocene	Less than 10,000	Young Alluvium	Qyf
Holocene	Less than 10,000	Young Alluvium, sand	Qyfa
Holocene	Less than 10,000	Young Alluvium, silt	Qyfs
Pleistocene/Holocene	10,000	Fan Deposits	Qf
Pleistocene	10,000–1.8 million	Old Alluvial Fan and Valley Deposits	Qof
Pleistocene	10,000–1.8 million	Old Paralic Deposits, silt	Qops

APD = Area of Project Disturbance

I-710 = Interstate 710



LEGEND

- I-710 Corridor Project Area of Potential Disturbance
- Young alluvial-fan deposits
- Old alluvial-fan deposits

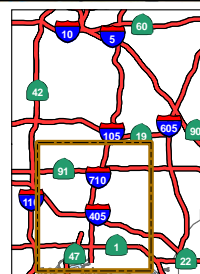
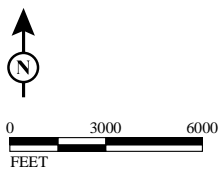
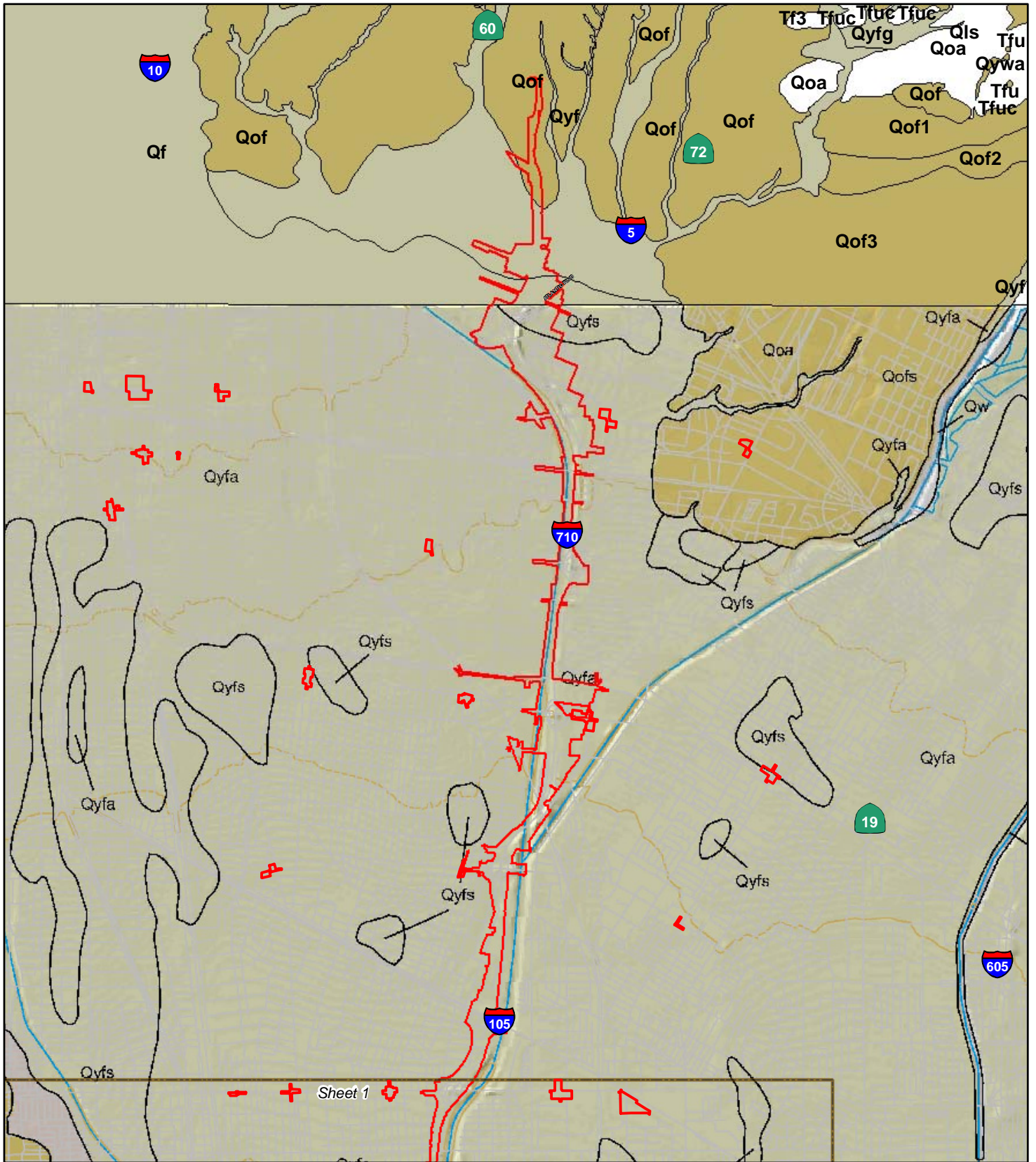


FIGURE 3
Sheet 1 of 2

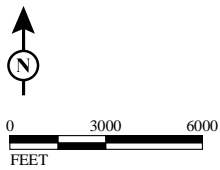
I-710 Corridor Project
07-LA-710- PM 4.9/24.9 EA 249900
Geology Map





LEGEND

- I-710 Corridor Project Area of Potential Disturbance
- Young alluvial-fan deposits
- Old alluvial-fan deposits



SOURCE: California Geological Survey
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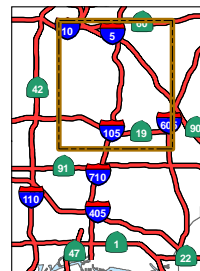


FIGURE 3
 Sheet 2 of 2

I-710 Corridor Project
 07-LA-710- PM 4.9/24.9 EA 249900
 Geology Map



Artificial Fill (af). Artificial fill is mapped throughout the APD. This is consistent with the fact that the I-710 Corridor Project is located in a developed area that has been substantially altered by human activity. Artificial fill consists of sediments that have been removed from one location and transported to another by humans. The transportation distance can range from a few feet to dozens of miles. Composition is dependent on the source. When it is compacted and dense, it is known as “engineered fill,” but it can be unconsolidated and loosely compacted. Artificial fill will sometimes contain modern debris such as asphalt, wood, bricks, concrete, metal, glass, plastic, and even plant material. Depending on the area, thickness can be less than one foot or several hundred feet.

Young Alluvium (Qyf, Qyfa, Qyfs). Young alluvium, also known as recent alluvium, can range in age from Recent to Latest Pleistocene. It is similar to older alluvium, but is usually located closer to an active stream channel. These deposits consist of loosely consolidated gravel, sand, and silt ranging from poorly sorted to well sorted, composed of mainly quartz, but also containing feldspar and biotite. The sand grains are generally subangular to subrounded, while the gravels and cobbles are rounded to well rounded. Color is usually yellow-brown to gray-brown, and is somewhat dependent on the nearby, or upstream, geology. These sediments cover the majority of the APD.

Fan Deposits (Qf). These deposits are considered transitional between the Pleistocene and Holocene and are found in the northern portion of the I-710 Corridor Project along the western Puente Hills. They were deposited as sheet flow off of these surrounding uplifts deposited alluvial fans into the Los Angeles Basin. Their composition is dependent on the source rocks from which they weathered.

Old Paralic Deposits and Old Alluvial Fan and Valley Deposits (Qops, Qof). Paralic deposits are marine or nonmarine-derived sediments that came from an estuarine or swamp environment. Older alluvium is an alluvial deposit older than 10,000 years and is often called a nonmarine terrace deposit, as it is often the sediment contained within the stream terraces that are above, and flank, the active stream channel. However, these sediments can also be found at depths below the active stream channel. These deposits consist of interbedded silt, clayey sand, and conglomeratic coarse-grained sands. Colors can vary from light yellows to browns and reds. The sand grains are generally subangular to subrounded, while the gravels and cobbles are rounded to well rounded. Within the APD, these deposits are well formed along the Los Angeles River.

3.1.2 Paleontology

Artificial Fill. Artificial fill can contain fossils, but these fossils have been removed from their original location and are thus out of context. They are not considered important for scientific study.



Young Alluvium. Young alluvium can contain remains of once-living things such as bones, shells, and plants; however, as these are less than 10,000 years old, not enough time has passed to mineralize the remains, and they are not considered to be “fossils.” In addition, most of the remains that are found are contemporaneous with modern species. Occasionally, fossils from older upstream formations are eroded out and transported to a new location. However, it is usually impossible to determine where the fossils originally came from.

Fan Deposits. Fossils have been recovered from similar deposits during construction of roads, housing developments, and other infrastructure (Jefferson, 1991a and 1991b). Remains of latest Pleistocene mammals are known from these sediments. The potential exists to encounter similar fossils in all Pleistocene (older) fan deposits.

Old Paralic Deposits and Old Alluvial Fan and Valley Deposits. Fossils have been collected in similar deposits from excavations for roads, housing developments, retention basins, and quarries in the Los Angeles Basin and vicinity (Lander, 2000; Jefferson, 1991a and 1991b; Conkling, 1997 and 1988; Miller, 1971). Remains of Rancholabrean animals, including elephant, horse, bison, camel, saber tooth cat, deer, and sloth, are known from these localities. The potential exists to encounter similar fossils in all Pleistocene alluvium.

3.1.3 Museum Records

The LACM does not have any recorded vertebrate localities within the APD of the I-710 Corridor Project. However, the LACM does have 27 localities recorded near the APD from the same or similar sedimentary deposits that occur within the APD. Project design refinements in 2011 did not extend beyond the locality search limits from the original LACM locality search. Some localities south of I-405 are within 0.5 mile of the APD (Appendix B).

Old Alluvial Fan and Valley Deposits and Old Paralic Deposits. Across the Los Angeles Basin, a veneer of Holocene sediments often overlies older, Pleistocene sediments. This creates a situation where excavation into Holocene surficial sediments extends into Pleistocene sediments with a high paleontological sensitivity. The majority of the APD is mapped as being underlain by young Holocene sediments, but the results of the locality search demonstrate that fossils are relatively common.

The LACM records numerous localities in these sediments in the vicinity of the I-710 Corridor Project. These localities have produced a “typical” suite of Rancholabrean land mammals, including bison, mammoth, diminutive antelope, horse, and giant ground sloth.

The LACM believes that shallow excavations in the uppermost few feet of the younger Quaternary alluvium exposed in portions of the I-710 Corridor Project APD are not likely to



uncover significant fossil vertebrate remains. Deeper excavations in the areas mapped as Quaternary alluvium that extend down toward older sedimentary deposits, however, may well encounter significant vertebrate fossils. Any excavations in the older Quaternary Alluvial Fan and Valley Deposits or Old Paralic Deposits may encounter significant to highly significant vertebrate fossils. Therefore, the LACM believes that, except for recent Quaternary alluvium, the paleontological sensitivity of the I-710 Corridor Project study area is rated high. The LACM believes that any substantial excavations should be closely monitored to quickly and professionally collect any specimens without impeding development. Any fossils recovered during construction should be deposited in an accredited and permanent scientific institution for the benefit of current and future generations.

The specific sensitivities for units within the study area are listed in Table B. This table lists the Paleontological Potential Sensitivity Scale used by Caltrans. Sensitivities (and potential) for the older alluvium, and Old Paralic Deposits are high to very high based on the presence of significant fossil remains that have been recovered from these units in other areas. It is likely that similar significant resources may be encountered if these units are encountered during excavation associated with the I-710 Corridor Project. Artificial fill is usually assigned a sensitivity of “low” in the event that excavation extends below the fill to the underlying formation or unit. The young alluvium has no sensitivity as it is too young to contain paleontological resources; however, like the artificial fill, it is usually assigned a sensitivity of “low” in case it is shallow and the underlying sediments are encountered.

Table B Geologic Units and Potential Paleontological Sensitivity within the I-710 Corridor APD

Geologic Unit	Paleontological Potential Sensitivity (Caltrans)
Artificial Fill	Low
Young Alluvium	Low
Fan Deposits	Low
Older Alluvial Fan and Valley Deposits	High
Paralic Deposits	High
Capistrano Formation	High

APD = Area of Project Disturbance

Caltrans = California Department of Transportation

I-710 = Interstate 710



3.2 FIELD SURVEY

The pedestrian surveys confirmed much of the geology as it has been mapped. In localized areas, artificial fill has been added and some limited exposures of subsurface bedrock are located along the portion of the I-710 Corridor Project study area south of SR-91.



4.0 RECOMMENDATIONS FOR THE PMP

4.1 INTRODUCTION

Caltrans and the SVP both present similar guidelines for adequate mitigation of impacts to significant nonrenewable paleontological resources. Excerpts from individual guidelines follow.

4.1.1 Society of Vertebrate Paleontology

Recommended general guidelines for conformable impact mitigation to significant nonrenewable paleontological resources have been published by the SVP (1995) along with conditions of receivership that the repository institution can require when receiving fossils recovered from construction projects (SVP, 1996). In areas determined through a records check and field survey to have a high potential for significant paleontological resources, an adequate program for mitigating the impact of development should include:

- A preliminary survey and surface salvage of any observed fossils prior to construction;
- Monitoring and salvage during project excavation;
- Preparation, including screen washing to recover small specimens (if applicable) and specimen preparation to a point of stabilization and identification;
- Identification, cataloging, curation, and storage into a museum or university that has a curator who can retrieve the specimens upon request; and
- A final report of the finds and their significance after all operations are completed.

All phases of mitigation are to be supervised by a professional paleontologist who maintains the necessary paleontological collecting permits and repository agreements. The Lead Agency ensures compliance with the measures developed to mitigate the impacts of excavation during the initial assessment. To ensure compliance from the start of the project, a statement that confirms the site's potential sensitivity, confirms the repository agreement with an established institution, and indicates the program for impact mitigation should be deposited with the Lead Agency and contractors before work begins. The program will be reviewed and accepted by the Lead Agency's designated vertebrate paleontologist. If a mitigation program is initiated early in the course of project planning, construction delays due to paleontologic salvage activities can be minimized or avoided.



4.1.2 California Department of Transportation

Caltrans has developed a set of guidelines similar those of the SVP to reduce impacts to paleontological resources. These recommendations start with avoidance of the resource area by the project and continue with recommendations for impact mitigation measures during construction excavation.

Avoidance. Avoidance of project impacts can be achieved by project redesign so that paleontological resources are completely outside the project's impact area (e.g., by using a different alignment route that misses the resource or a construction approach that does not entail construction excavation that would impact fossiliferous strata).

Environmentally Sensitive Areas. A related strategy creates Environmentally Sensitive Areas (ESAs) around paleontological localities. ESAs are a standard part of Caltrans and FHWA's toolkit to protect resources within or immediately adjacent to a project while concurrently delivering the project. Generally, these involve some combination of fencing or cyclic monitoring as an alternative to excavation monitoring. In the event the special measures prove ineffective for one reason or another, more traditional mitigation is necessarily called for. If viable and properly implemented, however, ESAs can reduce costs and time associated with more extensive traditional mitigation approaches.

Caltrans PMP. Since the geology of California is diverse and the nature of the fossils that it contains varies from one outcrop to the next, Caltrans does not provide generic paleontological resource impact mitigation, but instead presents a format for the PMP that can be utilized by the professional project paleontologist who has been retained to manage paleontological resources during project development. A full list of sections of the PMP is included in Caltrans' SER Environmental Handbook, Volume 1, Chapter 8. Briefly, the PMP sections are:

- **Introduction.** A brief discussion of the goals of the proposed study, of the construction project effects, and why mitigation is needed (e.g., compliance with CEQA).
- **Background.** Pertinent information should be provided to demonstrate familiarity with the project area and the type of fossils and rock units under study.
- **Description of the Resource.** A description of the rock units, boundaries of the fossiliferous formations, and locations of exposures in the vicinity of the I-710 Corridor Project study area and in the APD.



- **Proposed Research.** A clear, concise description of why the paleontological resource is significant or has scientific importance, and how the study is expected to address current gaps in the paleontological data.
- **Scope of Work.** The work plan to mitigate project effects, including all fieldwork and laboratory efforts. This may include:
 - Procedures for interfacing paleontological and construction personnel developed in consultation with the Resident Engineer (RE).
 - Construction monitoring programs should be outlined.
 - Salvage methods should be outlined, from large specimen recovery to collection and processing of microfossils.
 - Recovered specimens should be prepared to a point of identification and stabilized for preservation in conformance with individual repository requirements.
 - All recovered specimens should be cataloged using the format of the proposed curation facility.
 - Not all located fossils need to be recovered. Criteria for the discarding of specific fossil specimens should be made explicit.
- **Decision Thresholds.** How and when fieldwork will achieve the study goals, allowing fieldwork to cease, or any circumstances under which additional effort might be needed to achieve study goals.
- **Schedule.** The schedule for completing the proposed work may appear as text or in graphic form (e.g., a timeline) and include a start date, the duration of fieldwork and laboratory processing, and the time required for report preparation.
- **Justification of Cost Estimate.** Provides narrative support for the cost estimate, including the basis for person-hour estimates, clarification of overhead percentages, and any other costs.
- **Cost Estimate.** Presented as an appendix, this documentation should present a tabular summary of costs for the proposed effort and include all proposed numbers and levels of personnel, time, and costs.



- **Bibliography.** The bibliography should include only those references cited in the plan.
- **Curation.** The curation facility should be identified and a draft curation agreement included. A curation agreement with an approved facility must be in place prior to initiating any paleontological monitoring or mitigation activities.

The plan should be prepared by or under the supervision of a qualified Principal Paleontologist and submitted for review sufficiently in advance of an anticipated start-work date so that all involved agencies have time to comment, the Lead Agency has time to adjust the plan to accommodate such input, and the plan may be resubmitted for all necessary approvals. In the case of Caltrans projects, coordination with other agencies should be accomplished through Caltrans staff rather than consultants directly approaching land management/regulatory agencies. It is imperative that all agencies with jurisdiction over a paleontological site are in agreement as to the level of effort in the mitigation plan, including agreement on the applicability of pertinent laws, regulations, and permit requirements. When properly designed, the PMP serves as a basis for obtaining any necessary permits from other agencies.

Specific interagency issues may include, but are not limited to, health and safety issues; employee access and egress; collection, removal, and stockpiling of fossiliferous sediment; water washing; wet screen processing of fossiliferous sediment and disposal of muddy wastewater; and use of chemicals (kerosene) to break down specific types of indurated fossiliferous sediment. Agency permits that may be needed for access or to conduct the work of monitoring and salvage should be applied for and obtained in advance of the project.



5.0 CONCLUSION

The I-710 Corridor Project in the Los Angeles Basin crosses two fossiliferous early to late Pleistocene sediments deposited during the last 1.8 million years (Figure 3). These fossiliferous sediments crop out at the surface and may also be encountered below the surface of the I-710 Corridor Project. This study presents definitions of paleontological significance and sensitivity, the results of records search requests, and reviews of geological and paleontological literature.

This study does not anticipate special paleontological situations that would require project redesign to avoid critical localities or strata. However, because there are areas of high paleontological sensitivity within the I-710 Corridor Project study area, preparation of a Caltrans PMP is recommended prior to completion of final design within those areas of the I-710 Corridor Project identified as having high sensitivity. This PMP should be synthesized from outlines and guidelines provided by Caltrans and the SVP, and specifically tailored to the resources and sedimentary formations that will be encountered during excavation within the I-710 Corridor Project study area.

This study recommends that the section of the PMP describing the excavation monitoring for the I-710 Corridor Project include the following:

- A preconstruction field survey in areas identified as having high paleontological sensitivity after vegetation and paving have been removed, followed by salvage of any observed surface paleontological resources prior to the beginning of additional grading.
- Attendance at the pregrade meeting by a qualified paleontologist or representative. At this meeting, the paleontologist will explain the likelihood for encountering paleontological resources, what resources may be discovered, and the methods of recovery that will be employed.
- During construction excavation, a qualified vertebrate paleontological monitor shall initially be present on a full-time basis whenever excavation will occur within the sediments that have a high paleontological sensitivity rating and on a spot-check basis for excavation in sediments that have a low sensitivity rating. Monitoring may be reduced to a part-time basis if no resources are being discovered in sediments with a high sensitivity rating (monitoring reductions, when they occur, will be determined by the qualified Principal Paleontologist). The monitor shall inspect fresh cuts and/or spoils piles to recover paleontological resources. The monitor shall be empowered to temporarily divert construction equipment away from the immediate



- area of the discovery. The monitor shall be equipped to rapidly stabilize and remove fossils to avoid prolonged delays to construction schedules. The appropriate equipment may be considered to assist in the removal and/or collection of large fossil materials. This equipment shall be secured from the construction contractor at their expense, and be used only under the direction of the qualified Principal Paleontologist.
- Localized concentrations of small (or micro-) vertebrates may be found in all native sediments. Therefore, it is recommended that these sediments occasionally be spot-screened on site through one-eighth- to one-twentieth-inch mesh screens to determine whether microfossils are present. If microfossils are encountered, sediment samples (up to three cubic yards, or 6,000 pounds) shall be collected and processed through one-twentieth-inch mesh screens to recover additional fossils.
 - Recovered specimens shall be prepared to the point of identification and permanent preservation. This includes the sorting of any washed mass samples to recover small invertebrate and vertebrate fossils, the removal of surplus sediment from around larger specimens to reduce the volume of storage for the repository and storage cost, and the addition of approved chemical hardeners/stabilizers to fragile specimens.
 - Specimens shall be identified to the lowest taxonomic level possible and curated into an institutional repository with retrievable storage. The repository institutions usually charge a one-time fee based on volume, so removing surplus sediment is important. The repository institution may be a local museum or university with a curator who can retrieve the specimens on request. Caltrans requires that a draft curation agreement be in place with an approved curation facility prior to the initiation of any paleontological monitoring or mitigation activities.
 - Preparation and submittal of the PMR documenting completion of the PMP for the Lead Agency (Caltrans).

Implementation of these mitigation measures to avoid or minimize harm will reduce impacts to nonrenewable paleontological resources. More project-specific measures may need to be developed during preparation of the PMP to refine these measures during final project design.



6.0 REFERENCES CITED

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APPENDIX A
SUMMARY OF LEGISLATION



APPENDIX A

SUMMARY OF LEGISLATION

Laws, Regulations, and Guidance

This section summarizes federal and State laws and regulations pertaining to paleontological resources and how these integrate with project development and delivery activities. Policies and/or contact information for federal and State land management and regulatory agencies that have paleontological authorities and responsibilities are provided directly or by hotlink. In the event that a project involves land owned or administered by another federal or State agency, that agency should be contacted in order to ascertain any specific requirements they may have relative to paleontological resources. In addition to federal and State requirements, project proponents may also be subject to local ordinances concerning paleontological resources. Local ordinances are not summarized in this document, and local entities such as cities and counties should be contacted to determine whether there are additional local requirements that must be met.

Federal Legislation

A variety of federal statutes specifically address paleontological resources. They generally become applicable to specific projects if that delivery crosses federal lands or involves a federal agency license, permits, approval, or funding.

Antiquities Act of 1906 (16 United States Code [USC] 431-433). The Antiquities Act of 1906 states, in part, “That any person who shall appropriate, excavate, injure or destroy any historic or prehistoric ruin or monument, or any object of antiquity, situated on lands owned or controlled by the Government of the United States, without the permission of the Secretary of the Department of the Government having jurisdiction over the lands on which said antiquities are situated, shall upon conviction, be fined in a sum of not more than five hundred dollars or be imprisoned for a period of not more than ninety days, or shall suffer both fine and imprisonment, in the discretion of the court.” Although there is no specific mention of natural or paleontological resources in the Act itself, or in the Act’s uniform rules and regulations (Title 43 Part 3, Code of Federal Regulations [43 CFR 3]), “objects of antiquity” has been interpreted to include fossils by the National Park Service (NPS), the Bureau of Land Management (BLM), the United States Forest Service (USFS), and other federal agencies. Permits to collect fossils on lands administered by federal agencies are authorized under this Act (see Permit Requirements of Federal Agencies section, below). Therefore, projects involving federal lands will require permits for both paleontological resource evaluation and mitigation efforts.



Archaeological and Paleontological Salvage (23 USC 305). Statute 23 USC 305 amends the Antiquities Act of 1906. Specifically, it states, “Funds authorized to be appropriated to carry out this title to the extent approved as necessary, by the highway department of any State, may be used for archaeological and paleontological salvage in that state in compliance with the Act entitled ‘An Act for the preservation of American Antiquities,’ approved June 8, 1906 (PL 59-209; 16 USC 431-433), and State laws where applicable.”

This statute allows funding for mitigation of paleontological resources recovered pursuant to federal aid highway projects, provided that “excavated objects and information are to be used for public purposes without private gain to any individual or organization” (Federal Register [FR] 46(19): 9570; also see Federal Highway Administration [FHWA] policy section, below).

Federal-Aid Highway Act of 1956 (23 USC 78). Section 305 of the Federal Aid Highway Act of 1956 (23 USC 78, 78a) gives the FHWA authority to use federal funds to salvage archaeological and paleontological sites affected by highway projects.

National Registry of Natural Landmarks (16 USC 461-467). The National Natural Landmarks (NNL) Program was established in 1962 and is administered under the Historic Sites Act of 1935. Implementing regulations were first published in 1980 under 36 CFR 1212, and the program was redesignated as 36 CFR 62 in 1981. An NNL is defined as:

...an area designated by the Secretary of the Interior as being of national significance to the United States because it is an outstanding example(s) of major biological and geological features found within the boundaries of the United States or its Territories or on the Outer Continental Shelf (36 CFR 62.2).

National significance describes:

... an area that is one of the best examples of a biological community or geological feature within a natural region of the United States, including terrestrial communities, landforms, geological features and processes, habitats of native plant and animal species, or fossil evidence of the development of life (36 CFR 62.2).

Federal agencies (e.g., FHWA) and their agents (e.g., the California Department of Transportation [Caltrans]) should consider the existence and location of designated NNLs, and of areas found to meet the criteria for national significance, in assessing the effects of their activities on the environment under Section 102(2)(c) of the National Environmental Policy Act (NEPA) (42 USC 4321). The NPS is responsible for providing requested



information about the NNL Program for these assessments (36 CFR 62.6(f)). However, other than consideration under NEPA, NNLs are afforded no special protection. Furthermore, there is no requirement to evaluate a paleontological resource for listing as an NNL. Finally, project proponents (State and local) are not obligated to prepare an application for listing potential NNLs should such a resource be encountered during project planning and delivery.

Examples of paleontological NNLs in California include:

- Rancho La Brea—Hancock Park, Wilshire Boulevard, Los Angeles
- Sharktooth Hill—Kern County
- Rainbow Basin—near Barstow, San Bernardino County

For an up-to-date listing of NNLs in California, visit the NNL website.

National Historic Preservation Act of 1966 (NHPA; 16 USC 470). Section 106 of the NHPA does not apply to paleontological resources unless the paleontological specimens are found in culturally related contexts (e.g., a fossil shell included as a mortuary offering in a burial or a culturally related site, such as a petrified wood locale used as a chipped stone quarry). In such instances, the materials are considered cultural resources and are treated in the manner prescribed for the site in question, mitigation being almost exclusively limited to sites determined eligible for or listed on the National Register of Historic Places (National Register). It should be emphasized that cooperation between the cultural resource and paleontological disciplines is expected in such instances.

Section 4(f) of the Department of Transportation Act of 1966 (23 USC 138; 49 USC 1653). Section 4(f) of the Department of Transportation Act does not specifically address paleontological resources. This section of the law places restrictions on the ability of FHWA to take publicly owned 4(f) properties (which include parks, recreation areas, wildlife or waterfowl refuges, and National-Register-eligible or listed properties). Paleontological resources would only be addressed under this law if located within a 4(f) property.

National Environmental Policy Act of 1969 (42 USC 4321). NEPA directs federal agencies to use all practicable means to “Preserve important historic, cultural, and natural aspects of our national heritage...” (Section 101(b) (4)). Regulations for implementing the procedural provisions of NEPA are found in 40 CFR 1500 1508.

If the presence of a significant environmental resource is identified during the scoping process, federal agencies and their agents must take the resource into consideration when



evaluating the I-710 Corridor Project's effects. Consideration of paleontological resources may be required under NEPA when a project is proposed for development on federal land or land under federal jurisdiction. The level of consideration depends upon the federal agency involved (see Identification of Regulatory/Management Agencies section, below).

- **1872 Mining Law, amended 1988.** Excludes fossils (including petrified wood) from claim or patent. The USFS and BLM regulate the surface effects of development under this law. BLM regulations specifically state that operators may not knowingly disturb or destroy any scientifically important paleontological remains on federal lands, that they must notify an authorized officer of such finds, and that said officer shall take action to protect or remove the resource(s).
- **Mineral Leasing Act of 1920 (Section 30).** Requires and provides for the protection of interests of the United States. Natural resources, including paleontological resources, are commonly regarded as such interests.
- **Executive Order 11593, May 31, 1971, Protection and Enhancement of the Cultural Environment (36 CFR 8921).** Requires federal agencies to inventory and protect properties under their jurisdiction. NPS regulations under 36 CFR provide that paleontological specimens may not be disturbed or removed without a permit.
- **Archaeological and Historic Data Preservation Act of 1974 (P.L. 86-253, as amended by P.L. 93-921, 16 USC 469) Act of May 24, 1974 (88 Stat 174, Section 3 a0, 4a).** Provides for the survey, recovery, and preservation of significant scientific, prehistoric, historic, archaeological, or paleontological data when such data may be destroyed or irreparably lost due to a federal, federally licensed, or federally funded project. A Statement of Program Approach was published in the FR on March 26, 1979 (40 FR 18117) to advise as to the manner in which this law will be implemented.
- **36 CFR Part 800 (39 FR 3365, January 25, 1974; and 44 FR 6068, January 30, 1979).** Describes procedures for the protection of historic and cultural properties. Establishes procedures to ensure that historic and cultural resources are given proper consideration in the preparation of environmental impact statements.
- **Federal Land Management and Policy Act of 1976 (FLPMA, P.L. 94-579, 43 USC 1701-1782).** Provides authority to the BLM to regulate lands under its jurisdiction, managed in a manner to “protect the quality of scientific, scenic, historic, ecological, environmental...and archaeological values.” Authority is given to establish areas of critical environmental concern (ACEC).



- **Surface Mining Control and Reclamation Act of 1977 (SMCRA, P.L. 95-87, 30 USC 1201-1328).** Regulates surface coal mining and provides designation as unsuitable for surface mining if mining would “...result in significant damage to important cultural, scientific, and esthetic values and natural systems...”
- ***Paleontological Resource Management 1998, Bureau of Land Management Handbook H-8270-1.*** General Procedural Guidance for Paleontological Management.

State of California Legislation

The following State laws and regulations are applicable, or potentially applicable, to Caltrans and locally sponsored projects.

California Environmental Quality Act of 1970 (CEQA, 13 PRC, 2100, et seq.). Requires identification of potential adverse impacts of a project to any object or site of scientific importance (Div. 1, PRC 5020.1(b)).

The California Environmental Quality Act (CEQA) (Chapter 1, Section 21002) states that:

...it is the policy of the state that public agencies should not approve projects as proposed if there are feasible alternatives or feasible mitigation measures available which would substantially lessen the significant environmental effects of such projects, and that the procedures required are intended to assist public agencies in systematically identifying both the significant effects of proposed projects and the feasible alternatives or feasible mitigation measures which will avoid or substantially lessen such significant effects.

Guidelines for the Implementation of the California Environmental Quality Act, as amended May 10, 1980 (14 Cal. Admin. Code: 15000, et seq.). Requires mitigation of adverse impacts to a paleontological site from development on public land by construction monitoring. The CEQA Guidelines (Article 1, Section 15002(a)(3)) state that CEQA is intended to prevent significant, avoidable damage to the environment by requiring changes in projects through the use of alternatives or mitigation measures when the governmental agency finds the changes to be feasible.

Guidelines for the Implementation of CEQA, 1992, Appendix G, Section J (Significant Effects). The CEQA Guidelines, Appendix G, state, in part, that: “A project will ‘normally’ have a significant effect on the environment if it, among other things, will disrupt or adversely affect ...a paleontological site except as part of a scientific study.” If paleontological resources are identified during the Preliminary Environmental Analysis Report (PEAR) or other initial project scoping studies as being within the proposed project



area, the sponsoring agency (Caltrans or local agency) must take those resources into consideration when evaluating project effects. The level of consideration may vary with the importance of the resource.

Periodic review of CEQA-related court cases for decisions related to paleontology is also recommended. These cases can be found at the California Environmental Resources Evaluation System (CERES) website.

California Environmental Quality Act, State of California Public Resources Code, 2100-21177 as amended January 1, 1999, Appendix G Environmental Checklist Form. Impacts to known, important paleontological resources are specifically covered under CEQA as potentially significant effects (i.e., the project will have a significant effect on the environment). Specifically, each California project must answer the question: “Cultural Resource – would the project directly or indirectly destroy a unique paleontological resource or site or unique geological feature?” There are four possible answers: Potentially Significant Impact, Potentially Significant Unless Mitigation Incorporated, Less than Significant Impact, and No Impact.

California Coastal Act. The California Coastal Act, in part, authorizes the California Coastal Commission (CCC) to review permit applications for development within the coastal zone and, where necessary, to require reasonable mitigation measures to offset effects of that development. Permits for development are issued with “special conditions” to ensure implementation of these mitigation measures.

Section 30244 of the Act, “Archaeological or Paleontological Resources,” states that where development would adversely impact archaeological or paleontological resources, as identified by the State Historic Preservation Officer, reasonable mitigation measures shall be required.

If the CCC determines that a paleontological resource is present within an applicant’s proposed project area, it generally looks for evidence that the applicant has taken the resource into consideration (e.g., through formal survey by a professional paleontologist, with implementation of resulting recommendations). If a paleontological site is present, special permit conditions may range from avoidance of the site to construction monitoring and/or salvage of significant fossils. This approach virtually parallels the level of protection afforded to paleontological resources by CEQA. Additionally, the CCC relies heavily on project sponsoring or permitting agencies to ensure compliance with CEQA (and, consequently, the California Coastal Act).

Warren-Alquist Act (PRC 25000 et seq.). Requires the California Energy Commission to evaluate energy facility siting in unique areas of scientific concern (Section 26627).



Public Resources Code, Section 5097.5 (State 1965, c. 1136, p. 2792). Section 50987.5 of the California PRC Section states: “No person shall knowingly and willfully excavate upon, or remove, destroy, injure or deface any historic or prehistoric ruins, burial grounds, archaeological or vertebrate paleontological site, including fossilized footprints, inscriptions made by human agency, or any other archaeological, paleontological or historical feature, situated on public lands, except with the express permission of the public agency having jurisdiction over such lands. Violation of this section is a misdemeanor.”

As used in this section, “public lands” means lands owned by, or under the jurisdiction of, the State; any city, county, district, authority, or public corporation; or any agency thereof. Consequently, Caltrans and local project proponents are required to comply with PRC 5097.5 for their own activities, including construction and maintenance, as well as for permit actions (e.g., encroachment permits) undertaken by others.

Public Resources Code, Section 30244. Requires reasonable mitigation of adverse impacts to paleontological resources from development on public land.

California Administrative Code. Four sections of the California Administrative Code (Title 14, State Division of Beaches and Parks) administered by the California Department of Parks and Recreation, or CDPR) address paleontological resources. These include:

- **Section 4306, Geological Features:** “No person shall destroy, disturb, mutilate, or remove earth, sand, gravel, oil, minerals, rocks, or features of caves.”
- **Section 4307, Archaeological Features:** “No person shall remove, injure, disfigure, deface, or destroy any object of paleontological, archaeological, or historical interest or value.”
- **Section 4308, Property:** “No person shall disturb, destroy, remove, deface, or injure any property of the state park system. No person shall cut, carve, paint, mark, paste, or fasten on any tree, fence, wall, building, monument, or other property in the state parks, any bill, advertisement, or inscription.”
- **Section 4309, Special Permits:** “Upon a finding that it will be for the best interest of the state park system and for state park purposes, the director may grant a permit to remove, treat, disturb, or destroy plants or animals or geological, historical, archaeological, or paleontological materials; and any person who has been properly granted such a permit shall to that extent not be liable for prosecution for violation of the foregoing.”



These sections of the California Administrative Code establish authority and processes to protect paleontological resources while allowing mitigation through the permit process.

Local Laws and Regulations

Various cities and counties have passed ordinances and resolutions related to paleontological resources within their jurisdictions. Examples include the Counties of Orange, Riverside, and San Bernardino and the cities of San Diego, Carlsbad, Palmdale, and Chula Vista. These regulations generally provide additional guidance on assessment and treatment measures for projects subject to CEQA compliance. Project staff should periodically coordinate with local entities to update their knowledge of local requirements.

Further Reference

Additional information is posted on the SVP's website. In the event that a project involves lands administered by either federal or State entities, the local offices of those organizations should also be contacted for guidance and direction.



APPENDIX B
LOCALITY SEARCH RESULTS

CONFIDENTIAL



APPENDIX C

RESUMES

STEVEN W. CONKLING

PRINCIPAL/DIRECTOR, ARCHAEOLOGY/PALEONTOLOGY



EXPERTISE

Paleontology Resource Assessment/Mitigation

Cultural Resource Management and Mitigation

Fossil Identification

Specimen Curation

EDUCATION

North Texas State University, Denton, B.A., Biological Sciences, 1985.

ACCREDITATION

County of Orange, Certified Paleontologist, 1989

PROFESSIONAL AFFILIATIONS

Society for California Archaeology

Sigma Xi, Scientific Research Society

Society of Vertebrate Paleontology

Society of Economic Paleontology and Mineralogy

Southern California Academy of Science

American Association of Mammalogists

Buena Park Rotary Club, President 1989–1990

PROFESSIONAL RESPONSIBILITIES

Mr. Conkling conducts paleontological resource projects with responsibilities that include paleontological resource evaluation for Environmental Impact Reports; covering field surveys, literature reviews, and mitigation measures; directing field monitoring and salvage operations; collecting geologic data; fossil analyses; and report preparation.

He directs the Direct Cultural Resource Mitigation Group for LSA, including directing archaeological field activities, overseeing budgets, and coordinating Section 106 compliance with the United States Army Corps of Engineers. He also reviews all cultural resources reports.

PROJECT EXPERIENCE

Interstate 710 (I-710) Corridor EIR/EIS Los Angeles, California

Mr. Conkling is acting as the paleontological resource task manager for paleontological resource clearance for expansion of the I-710 facilities between the Port of Long Beach and SR-60. Review includes paleontological locality searches and pedestrian surveys of the project area. Work will be completed during late 2010 and early 2011.

Mid County Parkway Hemet, California

Mr. Conkling acted as cultural resource task leader and Agency coordination specialist during environmental documentation of the 32-mile-long project. Initial surveys covered approximately 15,000 acres and identified over 200 cultural resource sites. LSA coordinated a team of LSA and outside specialists to evaluate the architectural history and archaeology of all alternatives. Evaluation of all identified sites within the project Area of Potential Effects (APE) was completed in 2005.

South of I-10 On-Call Environmental Services (Contract No. 07A1893)

Los Angeles, California

Mr. Conkling acted as the Project Manager for historical review of the I-5 Widening Project north of Orange County. As a mitigation measure, Caltrans required a Phase 1 study to conduct a historical review of the project area to determine whether historical uses of some properties could be considered potential origins for hazardous materials. The analysis was also intended to help direct the Environmental Assessment team in looking at properties that were not flagged through existing databases.

PROFESSIONAL EXPERIENCE

Principal, Director of Cultural and Paleontological Division, LSA Associates, Inc., Irvine, California, 1993–present.

Clark Interpretive Center, County of Orange, Park Ranger/Paleontologist (Director of Museum), 1986–1993.

Orange County Natural History Museum, Curator, 1991–2006.

Los Angeles County Museum of Natural History, Research Associate, 1991–present.

San Bernardino County Museum, Research Associate, 1989–present.

Scientific Resource Surveys, Paleontological Consultant, 1989–1993.

Field Research Support Group, Board of Directors, 1990–present.

Mojave Desert Quaternary Research Society, Steering Committee Member, 1990–present.

Society of Vertebrate Paleontology, Ethics Committee Member, 1991–present.

RMW Paleontological Consultants, Paleontological Consultant, 1993.

Foundation for Field Research, Principal Investigator, Mud Hills Excavations, 1990, 1991.

Western Association of Vertebrate Paleontology, Meeting Host, 1990.

Foundation for Field Research, Co-Principal Investigator, Pleistocene Megafauna Project, 1989.

Fullerton Museum Center, Paleontological Consultant, 1989.

Knott's Berry Farm, Paleontological Consultant, *Kingdom of the Dinosaurs* Attraction, 1987.

PROJECT EXPERIENCE (CONTINUED)

I-5 HOV Lane Extension

San Clemente and San Juan Capistrano, California

Caltrans is proposing to add HOV lanes to I-5 between San Clemente and San Juan Capistrano. LSA prepared the overall environmental document for the project and conducted the cultural and paleontological resources studies in support of technical reports for the project. A historic adobe and several potential historic resources were identified through the study and addressed. Mr. Conkling served as the Cultural/Paleontological Resources Task Manager.

SR-210 On-Call Services

San Bernardino, California

Since 2001, LSA has been providing a variety of on-call services to San Bernardino Associated Governments for the SR-210 (formerly Route 30) Freeway project. Services to date have included environmental permitting (Sections 404, 401, and 1601), Section 7 endangered species consultation services, construction monitoring (biological and paleontological), jurisdictional waters delineations, preconstruction trapping surveys for endangered San Bernardino kangaroo rat (SBKR), relocation of SBKR, focused surveys for the SBKR and the California gnatcatcher, and various CEQA/NEPA documentation. Mr. Conkling provided monitoring and a monitoring report of a bone fragment find during excavation in the Lytle Creek area.

I-5 Widening Phase I Environmental Review, Technical Assistance Los Angeles County, California.

Mr. Conkling acted as the Project Manager for historical review of the I-5 Widening project north of Orange County. As a mitigation measure, Caltrans required the Phase I Study to conduct a historical review of the project area to determine whether historical uses of some properties could be considered potential origins for hazardous materials. The analysis was also intended to help direct the Environmental Assessment team in looking at properties that were not flagged through existing databases.

PROFESSIONAL EXPERIENCE (CONTINUED)

University of Kansas, Mammalogy Department, Curatorial Assistant, 1986.

Snow Entomology Museum, Curatorial Assistant, 1985.

Badlands National Park, Park Ranger/Paleontologist, 1984.

Texas A&M University, Agricultural Extension Center, Plant Taxonomist, 1983.

North Texas State University, Porphyrin Chemistry Laboratory Assistant, 1982.

Southern Methodist University, Shuler Museum of Paleontology, Curatorial Assistant, 1981, 1982.

Southern Methodist University, Shuler Museum of Paleontology, Field Assistant, 1981, 1982.

Southern Methodist University, Radiocarbon Laboratory, Laboratory Assistant, 1981, 1982.

Southern Methodist University, Geophysics Department, Seismograph Technician, 1980–1982.

Southern Methodist University, Biology Department, Field Assistant, Big Bend National Park, 1981.

Smithsonian Institution, Field worker, Lewisville Early Man Site, 1981.

PROJECT EXPERIENCE (CONTINUED)

Laguna Canyon Road (SR-133) Improvement Project Orange County, California

LSA was retained by the County of Orange to provide historical/archaeological documentation of cultural resources along Laguna Canyon Road (SR-133) for its proposed widening between El Toro Road and Old Laguna Canyon Road. LSA produced a Historic Property Survey Report (HPSR) with an appended Archaeological Survey Report (ASR), Historic Study Report (HSR), Extended Phase I Survey Report, Research Design, and Archaeological Evaluation Report (AER). Mr. Conkling served as Paleontologist.

San Joaquin Hills Transportation Corridor—SR-73 Orange County, California

Mr. Conkling oversaw all elements of paleontological resource mitigation during the construction of 4.5 miles of this project. Activities included coordinating monitoring of up to 12 monitors on a 24-hour-a-day, 7-day-a-week schedule. He completed comprehensive measured sections for all sedimentary units along the project, placing all discoveries into this lithostratigraphic framework. After project completion, he also developed a public interpretive display at the Old County Courthouse Museum, depicting the discoveries from the project.

South Orange County Transportation Infrastructure Improvement Project San Clemente, California

From initial involvement conducting Native American consultation, coordinating project review on Camp Pendleton, and addressing geotechnical investigations for the project, LSA involvement increased to addressing all elements of cultural resource compliance for the project. Current efforts involve survey and evaluation of all resources on the alternatives. Subsequent services will include treatment of impacts to eligible resources.