3.10 Geology, Soils, Seismicity, and Paleontological Resources

3.10.1 Introduction

This section identifies the existing geology, soils, and seismic conditions, including paleontological and mineral resources within the Tier 1/Program EIS/EIR Study Area and provides an evaluation of the No Build Alternative and the Build Alternative Options in relation to existing geological, mineral, and paleontological conditions.

3.10.2 Regulatory Framework

In accordance NEPA (42 USC Section 4321 et seq.), CEQ regulations implementing NEPA (40 CFR Parts 1501-1508), FRA's Procedures for Considering Environmental Impacts (64 FR 28545, May 26, 1999) and CEQA, FRA identified the prevailing geological and paleontological conditions within the Tier 1/Program EIS/EIR Study Area and evaluated the potential impacts on geology, soils, mineral resources, and paleontological resources as a result of implementing the Build Alternative Options.

Federal

Earthquake Hazards Reduction Act

In October 1977, the U.S. Congress passed the Earthquake Hazards Reduction Act to reduce the risks to life and property from future earthquakes in the U.S. through the establishment and maintenance of an effective earthquake hazards reduction program. To accomplish this goal, the Earthquake Hazards Reduction Act established the National Earthquake Hazards Reduction Program, which was further refined by the National Earthquake Hazards Reduction Program Act.

Track Safety Standards

Section 213.239, Special Inspections, of 49 CFR Part 213 requires that, in the event of fire, flood, severe storm, or other occurrence that might have damaged track structure, a special inspection shall be made of the track involved as soon as possible after the occurrence and, if possible, before the operation of any train over that track.

Paleontological Resources Preservation Act

The proposed rule (43 CFR Part 49, Paleontological Resources Preservation, November 21, 2016) would implement the Paleontological Resources Preservation Act of 2009 by providing standards for a coordinated approach to the management of paleontological resources on public lands. The rule clarifies how bureaus will manage paleontological resources to ensure they are available for current and future generations to enjoy as part of America's national heritage.

Uniform Building Code

The Uniform Building Code (UBC) is published by the International Conference of Building Officials and forms the basis for California's building code, as well as approximately half of the state building codes in the U.S. It has been adopted by the California Legislature to address the specific building conditions and structural requirements for California, as well as provide guidance on foundation design and structural engineering for different soil types.

State

Alquist-Priolo Earthquake Fault Zoning Act

The Alquist-Priolo (AP) Earthquake Fault Zoning Act (California PRC Sections 2621–2630) was passed into law following the destructive February 9, 1971 San Fernando earthquake, which was associated with extensive surface fault ruptures that damaged numerous structures. The act provides a mechanism for reducing losses from surface fault rupture on a statewide basis. The intent of the act is to ensure public safety by prohibiting the siting of most structures for human occupancy across traces of active faults that constitute a potential hazard to structures from surface faulting or fault creep.

California Building Code

California provides minimum standards for building design through the (Title 24). The 2016 California Building Code became effective January 1, 2017. With the shift from seismic zones to seismic design, the California Building Code philosophy has shifted from life safety design to collapse prevention, meaning that structures are designed for prevention of collapse for the maximum level of ground shaking that could reasonably be expected to occur at a site.

California Surface Mining and Reclamation Act of 1975

The CGS, formerly the California Division of Mines and Geology, classifies the regional significance of mineral resources in accordance with the Surface Mining and Reclamation Act of 1975 (California PRC Sections 2710-2796) and assists CGS in the designation of lands containing significant aggregate resources. Surface Mining and Reclamation Act regulates surface mining operations to ensure that adverse environmental impacts are minimized, and mined lands are reclaimed to a usable condition. Surface Mining and Reclamation Act also encourages the production, conservation, and protection of California's mineral resources.

California Public Resource Code

The California PRC includes provisions for the handling of paleontological resources. Specifically, PRC 5097.5 provides for the protection of paleontological resources and prohibits the removal, destruction, injury, or defacement of paleontological features on any lands under the jurisdiction of state or local authorities. PRC 30244 requires reasonable mitigation for impacts on paleontological resources that occur as a result of development.

Seismic Hazards Mapping Act

The California Department of Conservation provides guidance to the Seismic Hazards Mapping Act, which aims to reduce the threat of seismic hazard to public health and safety by identifying and mitigating seismic hazards. State, county, and city agencies are directed to utilize such maps in land use and permitting processes. The act also requires geotechnical investigations specific to the site be conducted before permitting occurs on sites within seismic hazard zones.

Regional

Goals and policies related to geology, soils, seismicity, paleontological, and mineral resources applicable to the Program were identified in the Los Angeles, Orange, San Bernardino, and Riverside Counties' general plans.

Los Angeles County 2035 General Plan

The Safety Element of the *Los Angeles County 2035 General Plan* (County of Los Angeles 2015) provides goals, objectives, policies, and programs related to hazards mitigation, emergency response, fire hazards, seismic/geotechnical hazards, and disaster recovery. The Safety Element identifies policies to reduce the potential risk of death, injuries, and economic damage resulting from natural and man-made hazards. The general plan prohibits new projects, as defined by the AP Act and Seismic Hazards Mapping Acts, until a comprehensive geotechnical study has been completed.

The Conservation and Natural Resources Element of the *Los Angeles County 2035 General Plan* provides goals, objectives, policies, and programs related to conservation of paleontological and mineral resources. Mineral resource policies include the protection of mineral resource zones (MRZ) from development and incompatible adjacent land uses and the management of identified mineral resources that allows for access, development, and conservation of mineral resources. Paleontological resource policies include the proper notification, mitigation, and recovery process for development on or near paleontological resources.

Orange County General Plan

The Safety Element of the *Orange County General Plan* (Orange County 2005) provides goals, objectives, and policies related to hazards that primarily impact persons and property in the unincorporated areas of Orange County and includes information on seismic and geologic hazards, including landslides, land subsidence, erosion, and soil characteristics.

The Resources Element of the *Orange County General Plan* provides goals, objectives, policies, and programs related to conservation of paleontological and mineral resources. Mineral resource policies include the protection of all mineral lands consistent with sound resource management practices and to reduce dependence on imported mineral resources for existing and future needs. Paleontological resource policies include identifying paleontological resource through literature, records research, and surface surveys and the proper notification, mitigation, and recovery process for paleontological resources for cultural, scientific, and education needs.

County of Riverside General Plan

The Safety Element of the *County of Riverside General Plan* (County of Riverside 2003) serves as the framework by which safety considerations are introduced into the land use planning process and identifies existing hazards and policies to reduce hazards for development.

The Open Space Element of the *County of Riverside General Plan* provides goals, objectives, policies, and programs related to conservation of paleontological and mineral resources. Mineral resource policies include the restriction of incompatible land uses within areas of existing or potential surface mining areas. The Open Space Element of the *County of Riverside General Plan* recognizes the importance of paleontological resources with the development of policies to ensure these resources are considered in project planning. These policies include the preparation of paleontological resource impact mitigation program and the proper documentation, curation, and mitigation of impacts on paleontological resources.

County of San Bernardino General Plan

The Safety Element of the *County of San Bernardino General Plan* (County of San Bernardino 2014) provides information on geologic hazards, seismic activity, landslides and mudslides, ground subsidence, volcanic activity, and wind/erosion and identifies goals and policies to reduce the potential risk of death, injuries, property damage, and economic and social dislocation resulting from fires, floods, earthquakes, landslides, and other hazards.

The Natural Resources Element of the *County of San Bernardino General Plan* provides goals, objectives, policies, and programs related to conservation of paleontological and mineral resources. Mineral resource policies include the prioritization of MRZ-2 lands by prohibiting or discouraging development of land that would preclude future development of mining facilities. Paleontological resource policies include the avoidance of paleontological resources whenever feasible and salvage and preservation of resources if avoidance is not possible.

Local and Tribal Governments

Regulations from cities, local agencies, and tribal governments would be identified in the Tier 2/Project-level analysis once site-specific rail infrastructure improvements and station locations are known.

3.10.3 Methods for Evaluating Environmental Effects

The methodology for the geological and paleontological evaluation consists of a service-level qualitative, and—where possible—quantitative, analysis that compares relative effects on geology, soils, mineral resources, and paleontological resources as a result of implementing each of the Build Alternative Options. A detailed evaluation that will identify Project-specific geotechnical engineering and permitting requirements will be completed for the Tier 2/Project-level analysis.

Geologic resources include subsurface geologic conditions and soil resources that can provide value or are useful to society. Geologic hazards associated with these and other geologic resources could pose potential danger to the built and natural environment. Geologic hazards include soils with steep slopes and high landslide susceptibility and seismic conditions.

The geologic setting is described in terms of the underlying geologic conditions and soil type. Due to the regional nature of the physical geological environment, seismic hazards (faults, ground shaking, liquefaction, and slope stability) in the Tier 1/Program EIS/EIR Study Area, as defined below, are described on a countywide basis. The likelihood for expansive soils, corrosive soils, and soil erosion is also described. Data, based on available GIS data, is tabulated by county.

To assess potential effects related to geology, soils, and mineral resources, aerial mapping was used to obtain information for the Tier 1/Program EIS/EIR Study Area. Active faults, MRZs, ground shaking, liquefaction, slope stability, and soil type were evaluated in the analysis.

Paleontological research for the Tier 1/Program EIS/EIR includes a geologic map review, paleontological sensitivity map review, soil typology review, and search of readily available literature for the Eastern Section under the Build Alternative Options. The results of the research were used to complete a paleontological sensitivity analysis, along with a qualitative assessment of potential effects on paleontological resources from implementation of the Eastern Section under Build Alternative Options 1, 2, and 3. The Western Section utilizes existing rail infrastructure, and no additional track improvements would be required to accommodate the proposed service; therefore, no ground disturbance would occur with implementation of the Build Alternative Options. As such, record searches and archival research were only conducted for the Eastern Section because ground disturbance would be required for the infrastructure improvements proposed for this section.

Tier 1/Program EIS/EIR Study Area

This service-level evaluation is limited to a desktop analysis of the data sources described in Section 3.10.3. The Tier 1/Program EIS/EIR Study Area was combined with GIS overlays to identify areas where seismic and geologic hazards may occur (e.g., ground shaking, liquefaction, slope stability and the likelihood for expansive soils, corrosive soils, and soil erosion) and where potential environmental resources (e.g., paleontological or mineral resources) could be affected by the Program. These potential areas were identified on a broad scale using available mapping information. A detailed description of the Tier 1/Program EIS/EIR Study Area is provided in Section 3.1, Introduction to Environmental Analysis, of this Tier 1/Program EIS/EIR.

Data Sources

Online GIS data sources available from USGS, CGS, and a variety of other sources were used to identify areas containing potential seismic/geologic hazards, paleontological resources, and mineral resources within the Tier 1/Program EIS/EIR Study Area. Specifically, the following resources were reviewed:

- **Earthquake Hazards Program:** Stores information reported by USGS on identified active faults and landslide susceptibility, data on the dates of seismic activity for active faults, and maps of soils that have physical properties or topographic position susceptible to landslides

- **Earthquakes and Faults Program:** Stores information reported by CGS related to ground motion earthquake records, distribution of historic earthquakes, and maps showing potential for ground shaking, fault rupture, liquefaction, and seismically induced landslides in California.
- **Mineral Resource Mapping:** Stores information generated by CGS that identify mineral resources zones with the potential for production of geologic resources, such as metals, minerals, and construction aggregate important to the state's economy
- **Mines Online Interactive Map:** A California Department of Conservation (Division of Mine Reclamation) database that provides information such as mine name, mine status, commodity sold, location, and other mine-specific data

Related Resources

There are no related resources that would contribute to the assessment of Tier 1/Program EIS/EIR effects on geology, soils, mineral resources, and paleontological resources.

3.10.4 Affected Environment

Southern California straddles the Pacific tectonic plate and the North American tectonic plate. The slow movements of these plates over time has created a complex and diverse geological setting unique to this region. Evidence of historic seismic activity is present in the numerous mountain ranges, valleys, canyons, and other geological features in the region. Present seismic activity is apparent in the numerous faults throughout the region, earthquakes, liquefaction, and landslides.

The Program Corridor is approximately 144 miles long and traverses a diverse geological area from its western terminus in the Los Angeles Basin to its eastern terminus in the Coachella Valley. The majority of the Program Corridor from the Los Angeles Basin to San Gorgonio Pass is located at the boundary of the Transverse Ranges Geomorphic Province and the northern Peninsular Ranges Geomorphic Province. The topography crossed by the Program Corridor ranges from relatively flat, urban landscapes in the Western Section to hilly canyons in the central portion, and flat, low desert habitat in the Eastern Section. Elevations within the Program Corridor range from 300 feet above mean sea level at the western terminus in Los Angeles up to 600 feet in Corona, 1,000 feet in Colton, and 2,600 feet in Beaumont (highest elevation), and down to 75 feet below mean sea level at the eastern terminus in Coachella (lowest elevation). From San Gorgonio Pass to the Coachella Valley, the Tier 1/Program EIS/EIR Study Area lies at the boundary of the Peninsular Ranges Geomorphic Province and the Colorado Desert Geomorphic Province.

The majority of the Tier 1/Program EIS/EIR Study Area is underlain by marine and non-marine sedimentary rock of the Holocene Age and Pleistocene Age consisting of unconsolidated and semi consolidated alluvium, lake, playa, and terrace deposits.

Earthquake Faults and Alquist-Priolo Fault Zones

The Tier 1/Program EIS/EIR Study Area is located within an active seismic region and is expected to experience ground shaking from an earthquake occurring along several major active or potentially active faults in Southern California. The probability that the Tier 1/Program EIS/EIR Study Area would be subject to strong seismic shaking is considered moderate to high, due to the proximity of known active faults in the region. The USGS 1-year probabilistic seismic hazard forecast for induced and natural earthquakes indicates that Los Angeles County, Orange County, southwest San Bernardino County, and the western half of Riverside County have a 2 to 5 percent chance of experiencing ground shaking resulting in minor damage (USGS 2020). As shown on Figure 3.10-1, the Tier 1/Program EIS/EIR Study Area traverses multiple earthquake faults and AP fault zones.

Figure 3.10-1. Potential Seismic and Geologic Hazard Zones within the Tier 1/Program EIS/EIR Study Area

(Sheet 1 of 6)

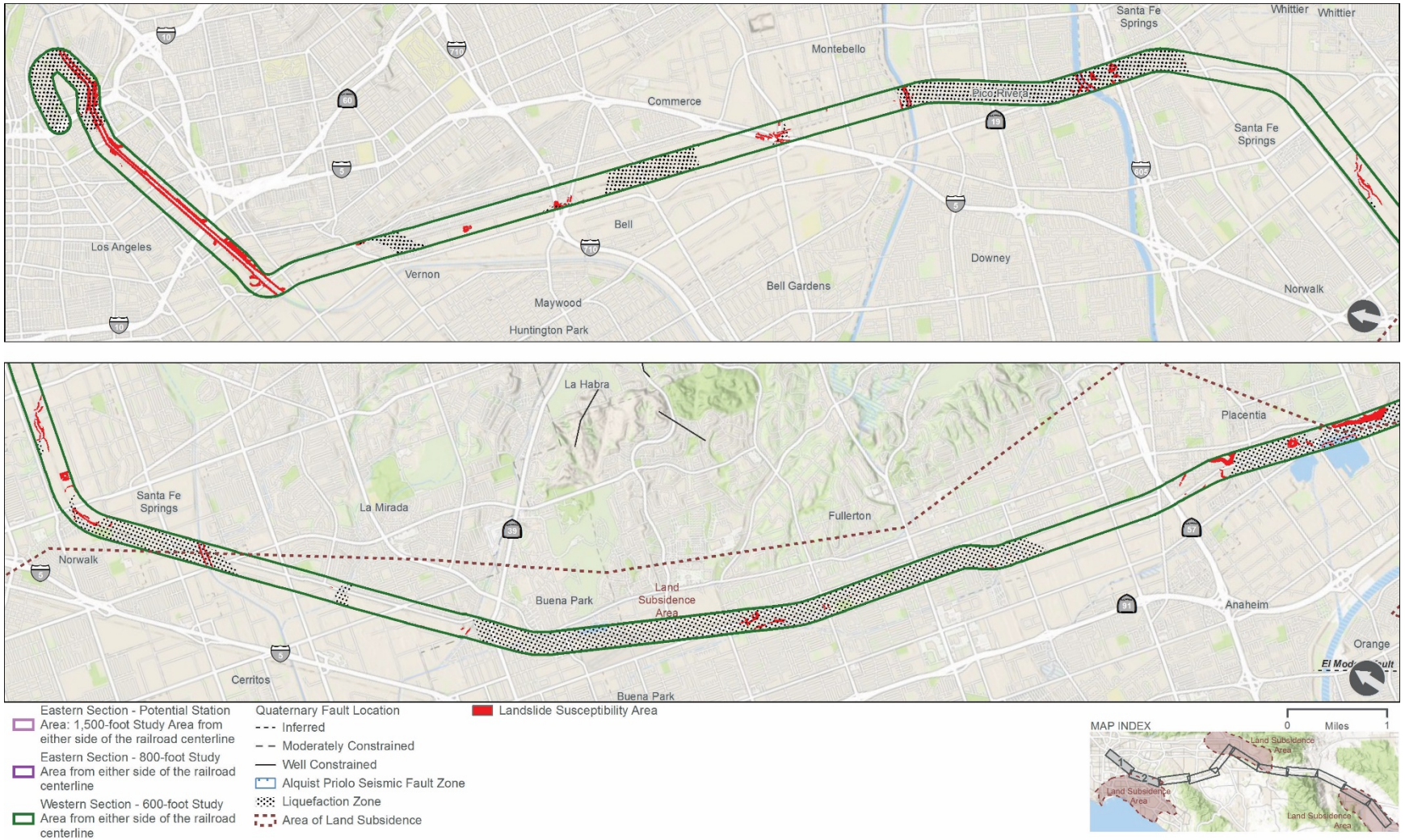

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Figure 3.10-1. Potential Seismic and Geologic Hazard Zones within the Tier 1/Program EIS/EIR Study Area

(Sheet 2 of 6)

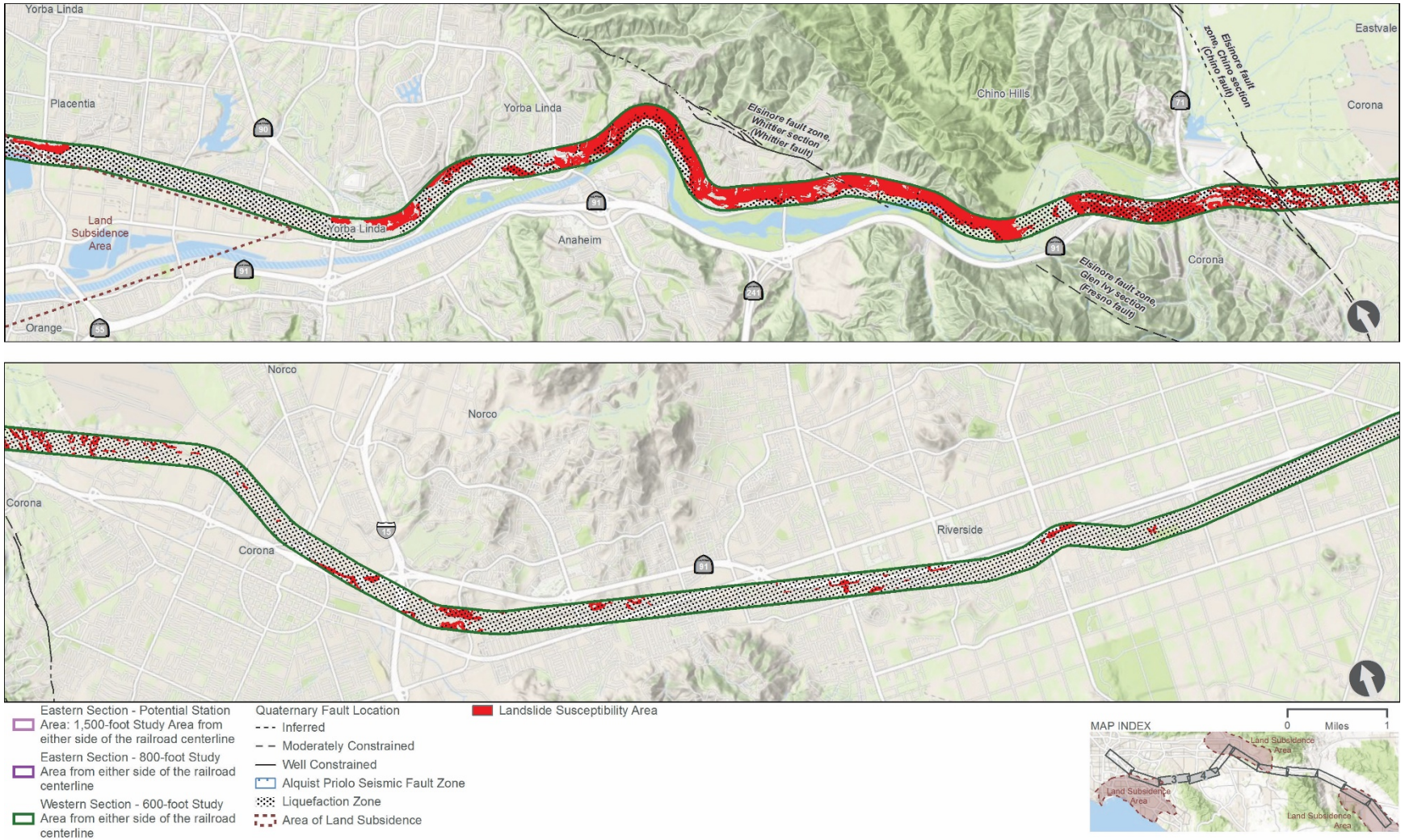

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Figure 3.10-1. Potential Seismic and Geologic Hazard Zones within the Tier 1/Program EIS/EIR Study Area

(Sheet 3 of 6)

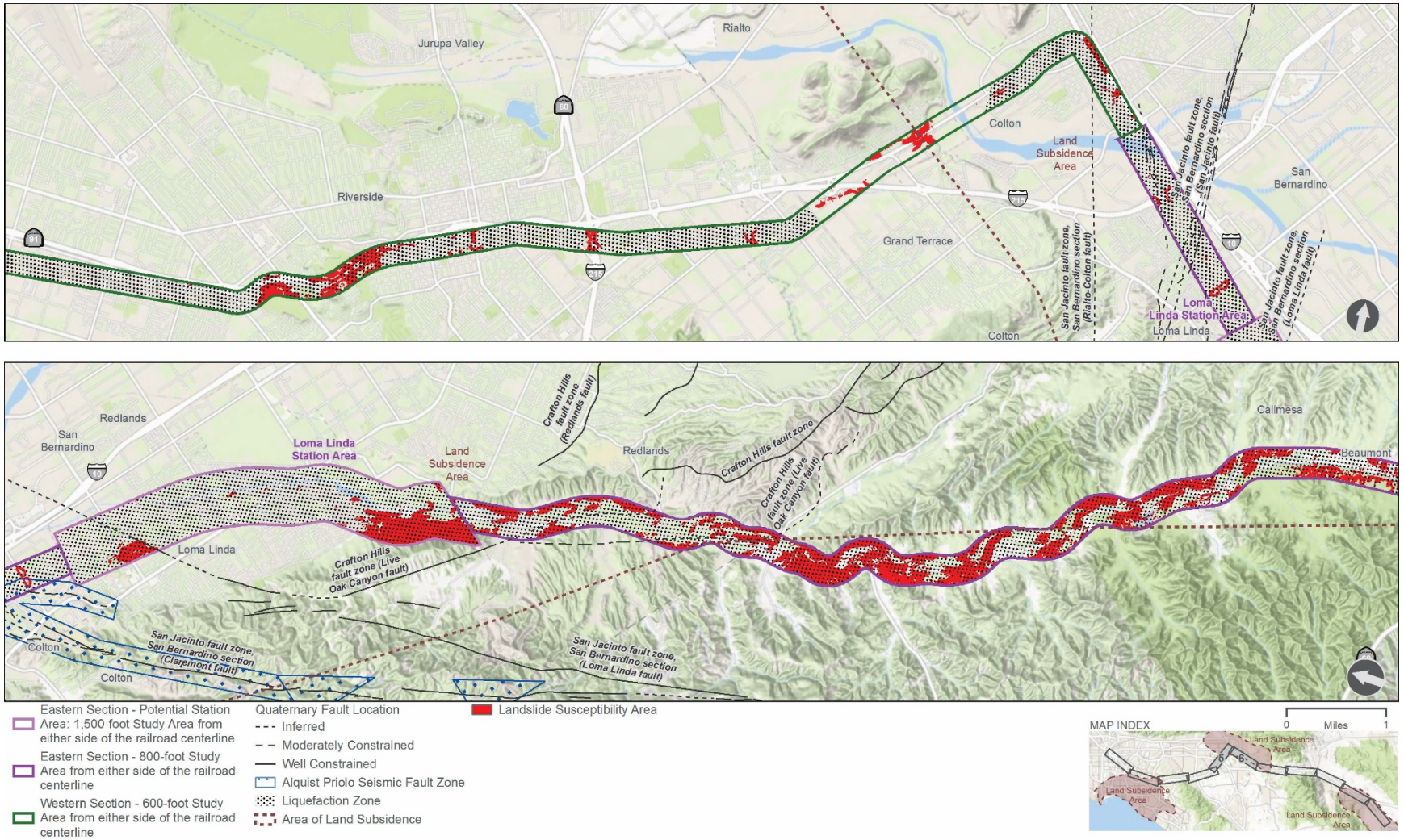

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Figure 3.10-1. Potential Seismic and Geologic Hazard Zones within the Tier 1/Program EIS/EIR Study Area

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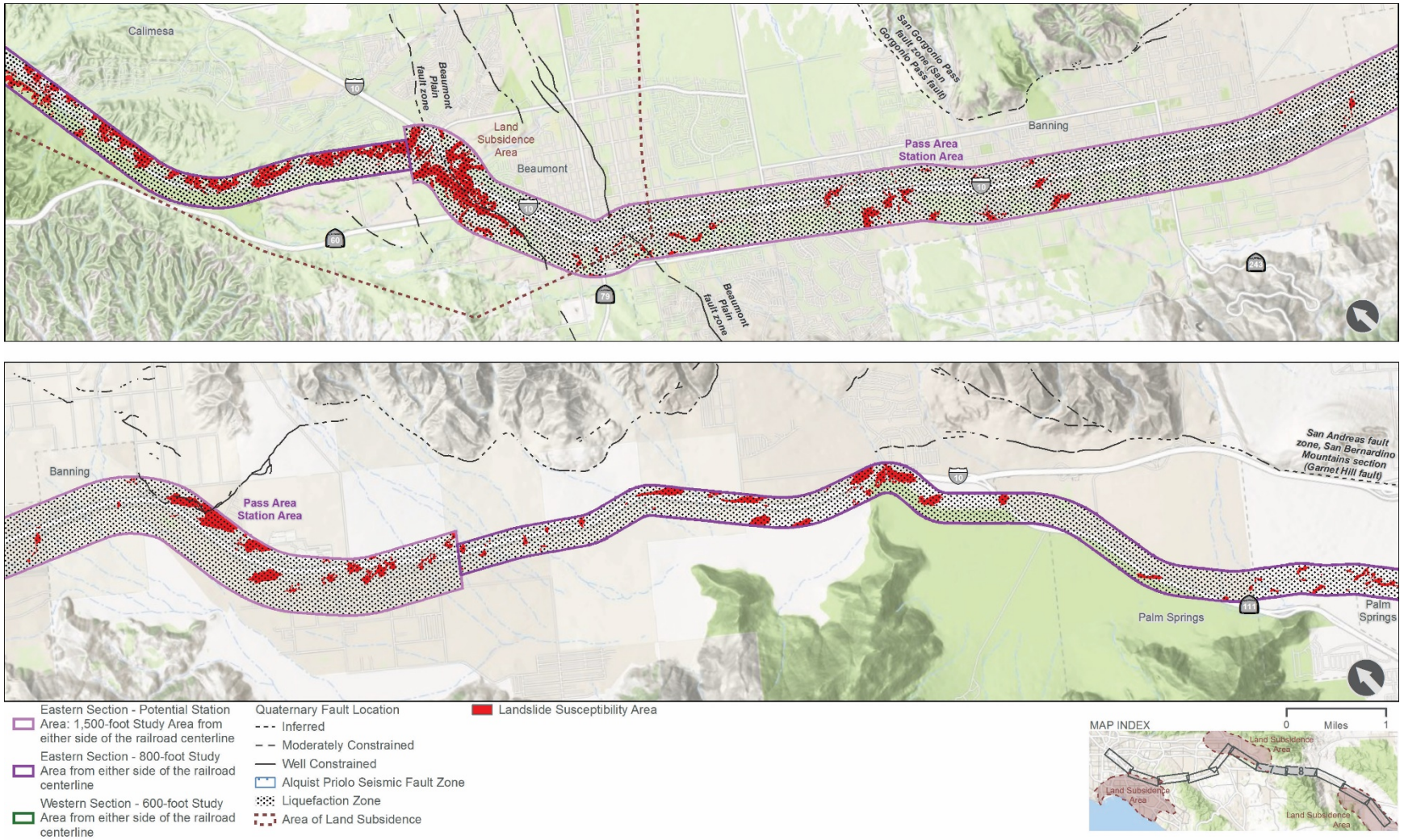

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Figure 3.10-1. Potential Seismic and Geologic Hazard Zones within the Tier 1/Program EIS/EIR Study Area

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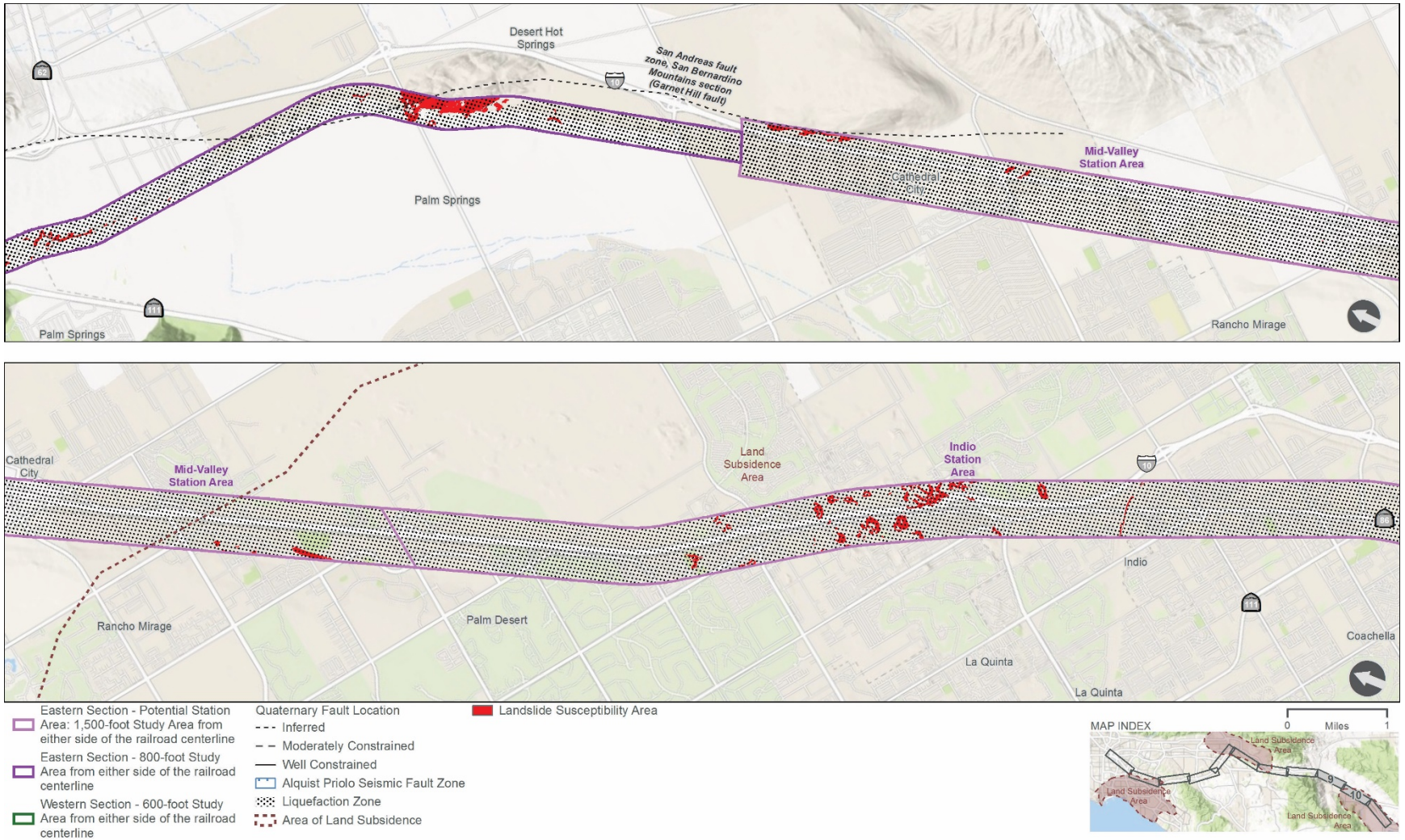

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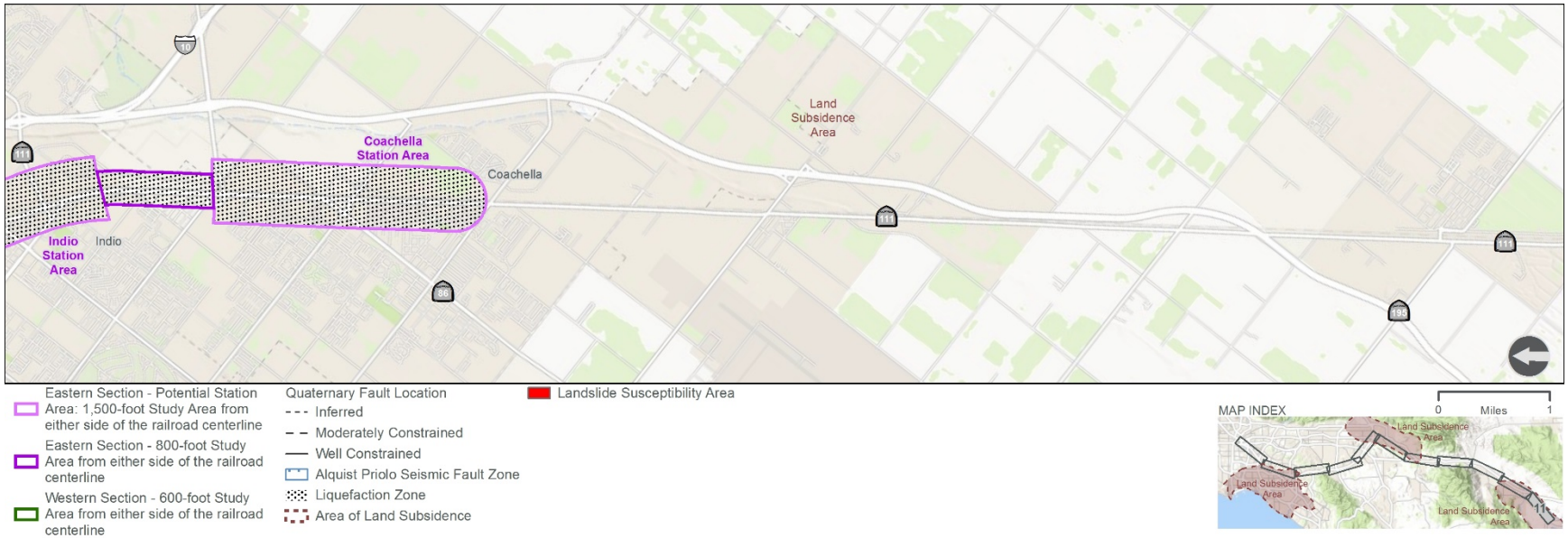
Figure 3.10-1. Potential Seismic and Geologic Hazard Zones within the Tier 1/Program EIS/EIR Study Area

(Sheet 6 of 6)



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Build Alternative Option 1 (Coachella Terminus)

There are portions of the Build Alternative Option 1 that cross an earthquake fault or are mapped as being within an AP fault zone. Table 3.10-1 provides a summary of earthquake faults and AP fault zones located within Build Alternative Option 1.

Table 3.10-1. Summary of Earthquake Faults and Zones (Build Alternative Options 1, 2, and 3)

Earthquake Fault	Earthquake Fault Zone	Earthquake Fault Zone Section	County
Whittier Fault	Elsinore Fault Zone	Whittier Section	Orange
Chino Fault	Elsinore Fault Zone	Chino Section	Riverside
Rialto-Colton Fault	San Jacinto Fault Zone	San Bernardino Section	San Bernardino, Riverside
San Jacinto Fault	San Jacinto Fault Zone	San Bernardino Section	San Bernardino
Loma Linda Fault	San Jacinto Fault Zone	San Bernardino Section	San Bernardino
Claremont Fault	San Jacinto Fault Zone	San Bernardino Section	San Bernardino
Live Oak Canyon Fault	Crafton Hills Fault Zone	—	San Bernardino, Riverside
—	Beaumont Plain Fault Zone	—	Riverside
Garnet Hill Fault	San Andreas Fault Zone	San Bernardino Mountains Section	Riverside

Source: USGS 2020

Build Alternative Option 2 (Indio Terminus)

Identified earthquake faults and AP fault zones located within Build Alternative Option 2 (Table 3.10-1) are the same as Build Alternative Option 1.

Build Alternative Option 3 (Indio Terminus with Limited Third Track)

Identified earthquake faults and AP fault zones located within Build Alternative Option 3 (Table 3.10-1) are the same as Build Alternative Option 1.

Seismic/Geologic Hazard Zones

Seismic or geologic hazards are natural seismic or geologic events that can endanger human lives and threaten property. Potential seismic or geologic hazards include liquefaction/seismically induced settlement, slope instability (landslide susceptibility), collapsible and expansive soils, corrosive soils, and subsidence. As shown on Figure 3.10-1, the Tier 1/Program EIS/EIR Study Area contains areas where seismic or geologic hazards zones may be present. Table 3.10-2 provides background information for these seismic or geologic hazards.

Table 3.10-2. Seismic and Geologic Hazards Definitions

Seismic/Geologic Hazard	Definition	Potential Occurrence
Liquefaction	Liquefaction is the loss of soil strength or stiffness due to a buildup of pore-water pressure during ground shaking. Liquefaction is associated primarily with loose (low-density), saturated, fine- to medium-grained, cohesionless soils. Effects of liquefaction can include sand boils, excessive displacements, bearing capacity failures, and lateral spreading.	Liquefaction can occur primarily within loose to moderately dense sandy soil due to reduction in volume during and shortly after an earthquake event.
Seismically induced settlement	Seismically induced settlement consists of dry dynamic settlement (above groundwater) and liquefaction-induced settlement (below groundwater).	This settlement occurs primarily within loose to moderately dense sandy soil due to reduction in volume during and shortly after an earthquake event.
Slope instability (landslides)	Slope instability is related to slope gradient, soil or rock type, consolidation or cementation of the rock, and the amount of fracturing of the rock. Generally, slopes of 10 degrees or more are subject to seismically induced land sliding.	Land sliding can be seismically induced, resulting from extended periods of ground shaking and high ground accelerations. Improper grading and excessive rainfall or irrigation can also increase the susceptibility of land sliding.

Seismic/Geologic Hazard	Definition	Potential Occurrence
Collapsible soils	Collapsible soils are soils that undergo settlement upon wetting, even without the application of additional loads. Typical collapsible soils are low in plasticity and have relatively low moisture contents and densities.	Effects resulting from collapsible soils have largely been addressed by county and municipal building codes.
Expansive soils	Expansive soils are generally plastic clays that can undergo a substantial increase in volume with an increase in moisture content and a substantial decrease in volume with a decrease in moisture content. Expansive soils can cause uplift pressures that can lead to structural damage.	Effects resulting from expansive soils have largely been addressed by county and municipal building codes.
Corrosive soils	Soil corrosion occurs when chemical compounds in the soils interact with structural materials in ways that weaken the materials. Metals are attacked by a chloride solution whereas concrete is typically affected by high sulfate levels.	Effects resulting from corrosive soils have largely been addressed by county and municipal building codes.
Land subsidence	Land subsidence, or the settling of land over time, can occur for a number of reasons.	Within Southern California, land subsistence is generally caused by the lowering of the water table from groundwater withdrawals.

Build Alternative Option 1 (Coachella Terminus)

As shown on Figure 3.10-1, the majority of the Western Section and Eastern Section of Build Alternative Option 1 is within a seismically induced liquefaction zone and portions are located within landslide susceptibility zones.

For portions of the Western Section located within southeast Los Angeles County and northwest Orange County, landslide susceptibility is low due to the relatively flat topography. For portions of the Western Section located in northeast Orange County, landslide susceptibility is moderate to high due to steep slopes and landslide-prone rocks. This variation in landslide susceptibility is also present in the Eastern Section of Build Alternative Option 1. Portions of the Eastern Section cross areas with relatively flat topography, resulting in a low landslide susceptibility potential. For portions of the Eastern Section that are located within or adjacent to steep slopes (Crafton Hills, Loma Linda

Hills, San Gorgonio Pass, San Timoteo Canyon, Reche Canyon), there is a moderate to high landslide susceptible potential.

As shown on Figure 3.10-1, there are three USGS mapped areas of land subsidence within Build Alternative Option 1: Los Angeles/Santa Ana Basin subsidence area, Yucaipa Valley subsidence area, and Coachella Valley subsidence area. Portions of the Western Section of Build Alternative Option 1 that cross through Anaheim are located within the Los Angeles/Santa Ana Basin subsidence area, while portions that cross through Riverside and Colton are located within the Yucaipa Valley subsidence area. The majority of the Eastern Section of Build Alternative Option 1 is located in either the Yucaipa Valley or Coachella Valley subsidence areas. As identified by USGS, the subsidence in these areas was a result of excessive groundwater pumping in the region. Groundwater within these regions is an important water supply source with the demand for water exceeding the deliveries of imported surface water. As a result, groundwater levels have been declining as a result of increased pumping resulting in land subsidence in the region. To counteract the noted land subsidence, local and regional agencies have implemented various measures including the adjudication of certain groundwater basins (San Bernardino Basin and Beaumont Basin within the Yucaipa Valley subsidence area) and the installation off a network of continuous global positioning system stations to monitor subsidence (within the Coachella Valley subsidence area).

Build Alternative Option 2 (Indio Terminus)

Potential seismic and geologic hazard zones within Build Alternative Option 2 are the same as Build Alternative Option 1.

Build Alternative Option 3 (Indio Terminus with Limited Third Track)

Potential seismic and geologic hazard zones within Build Alternative Option 3 are the same as Build Alternative Option 1.

Paleontological Resources

Paleontological resources—or fossils—are the remains of ancient plants and animals that can provide scientifically significant information about the history of life on Earth. Paleontological sensitivity is defined as the potential for a geologic unit to produce scientifically significant fossils. This sensitivity is determined by rock type, history of the rock unit in producing significant fossils, and fossil localities that are recorded from that unit. Paleontological sensitivity is assigned based on fossil data collected from the entire geologic unit, not just at a specific site. Paleontological sensitivity (potential) ratings (Society for Vertebrate Paleontology 2010) are summarized in Table 3.10-3.

Table 3.10-3. Paleontological Sensitivity Ratings

Sensitivity Potential	Definition
High sensitivity	Rock units from which vertebrate or significant invertebrate, plant, or trace fossils have been recovered are considered to have a high potential for containing additional significant paleontological resources. Rocks units classified as having high potential for producing paleontological resources include, but are not limited to, sedimentary formations and some volcaniclastic formations (e.g., ashes or tephras), some low-grade metamorphic rocks that contain significant paleontological resources anywhere within their geographical extent, and sedimentary rock units temporally or lithologically suitable for the preservation of fossils (e.g., middle Holocene and older, fine-grained fluvial sandstones, argillaceous and carbonate-rich paleosols, cross-bedded point bar sandstones, fine-grained marine sandstones, etc.).
Low sensitivity	This includes rock units that have low potential for yielding significant fossils. Such rock units will be poorly represented by fossil specimens in institutional collections. Rock units with low potential typically will not require impact mitigation measures to protect fossils.
Undetermined sensitivity	Rock units for which little information is available concerning their paleontological content, geologic age, and depositional environment are considered to have undetermined potential. Further study is necessary to determine if these rock units have high or low potential to contain significant paleontological resources.

Paleontological resources are considered non-renewable resources because they are the remains of prehistoric animal and plant life.

Given the diversity of geologic units found within the Tier 1/Program EIS/EIR Study Area, the paleontology is equally diverse, and, in some areas, fossil resources are abundant. A detailed analysis of the paleontological sensitivity of each geologic formation within the Tier 1/Program EIS/EIR Study Area is beyond the scope of the Tier 1/Program-level analysis and would be the subject of Tier 2/Project-level paleontological assessments. A generalized description of regional paleontological settings has been provided below.

In the western portion of Riverside County, fossils occur in sediments lying on the surface of crystalline bedrock or are deposited in or between the major fault zones. The eastern desert portions of Riverside County are marked by fault block mountains that contain older fossil-bearing sediments with younger fossil-containing deposits found around dry lakes, along high stands of the Salton Sea and in terraces left by the Colorado River.

The oldest fossils in California are from the Proterozoic Age, dating to 900 million years ago. However, no fossils from the Proterozoic Age are currently known to occur in Riverside County. It is thought that in this area of Southern California, fossils earlier than the Jurassic Period may have been destroyed by the natural processes of metamorphism (geological changes in the rocks and soils). The oldest fossils found in Riverside County date to the Late Jurassic Period (approximately 150 million years ago) (Riverside County Planning Department 2015).

Figure 3.10-2 shows areas of potential paleontological sensitivity within the Tier 1/Program EIS/EIR Study Area.

Figure 3.10-2. Paleontological Sensitivity within the Tier 1/Program EIS/EIR Study Area

(Sheet 1 of 6)

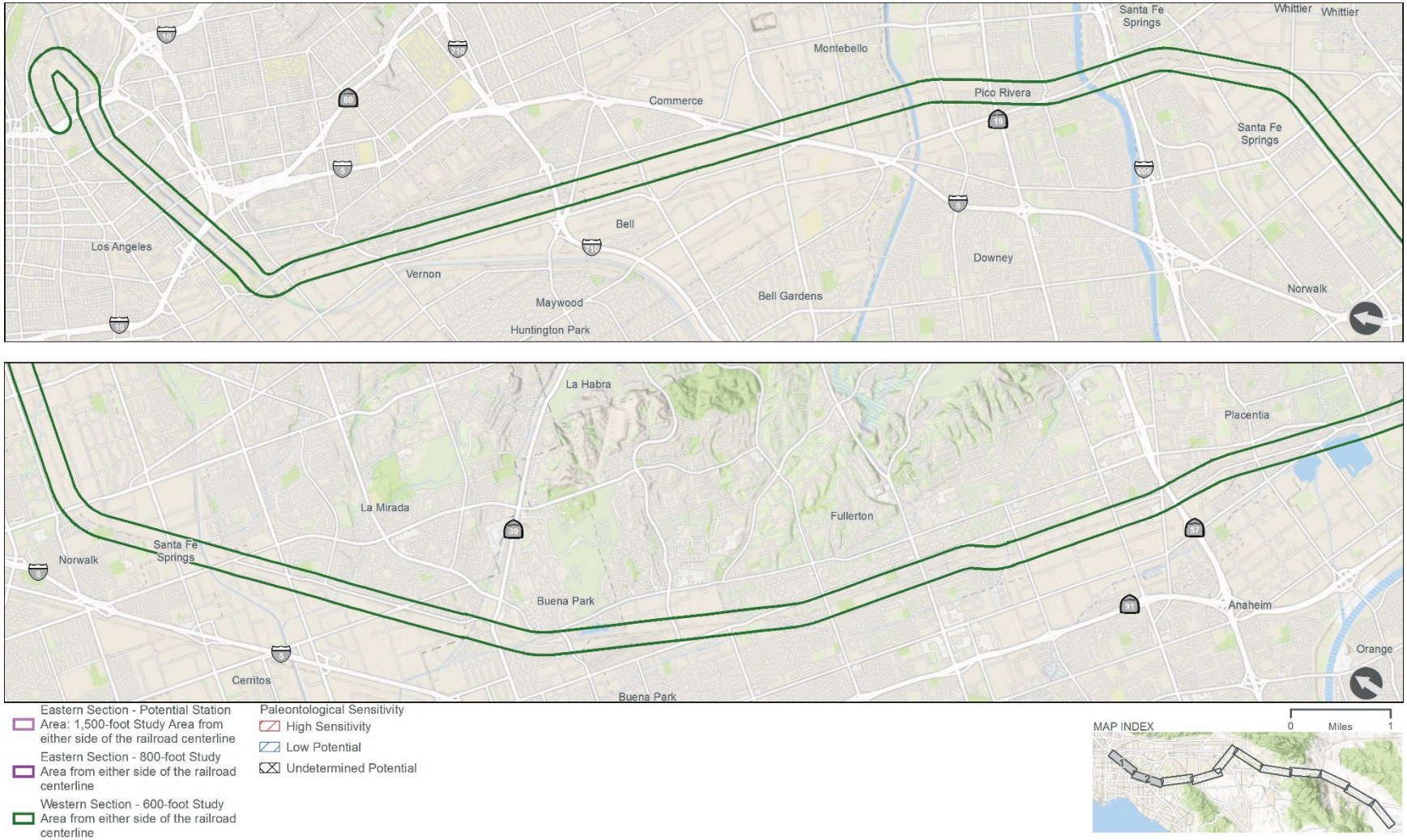

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Figure 3.10-2. Paleontological Sensitivity within the Tier 1/Program EIS/EIR Study Area

(Sheet 2 of 6)

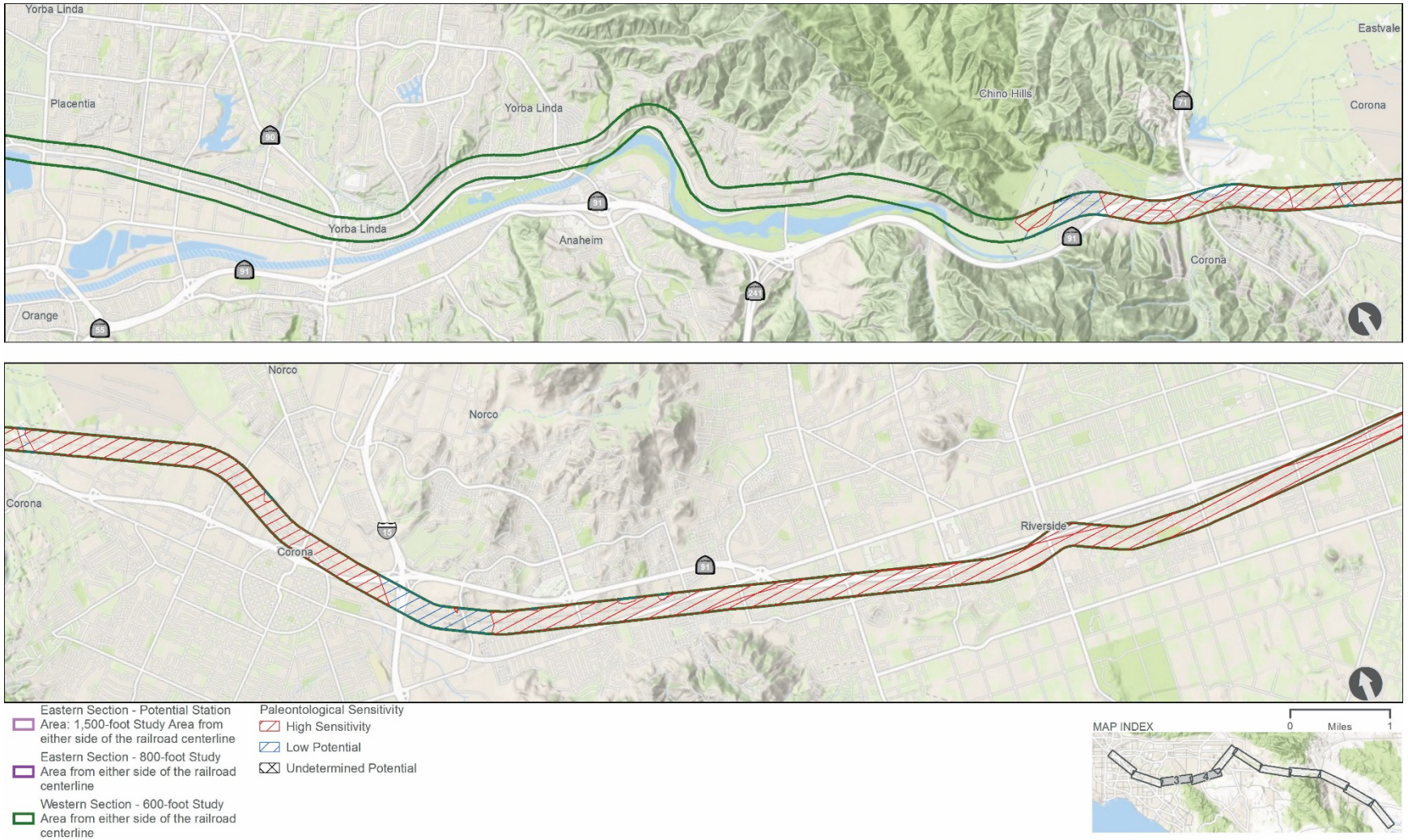

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Figure 3.10-2. Paleontological Sensitivity within the Tier 1/Program EIS/EIR Study Area

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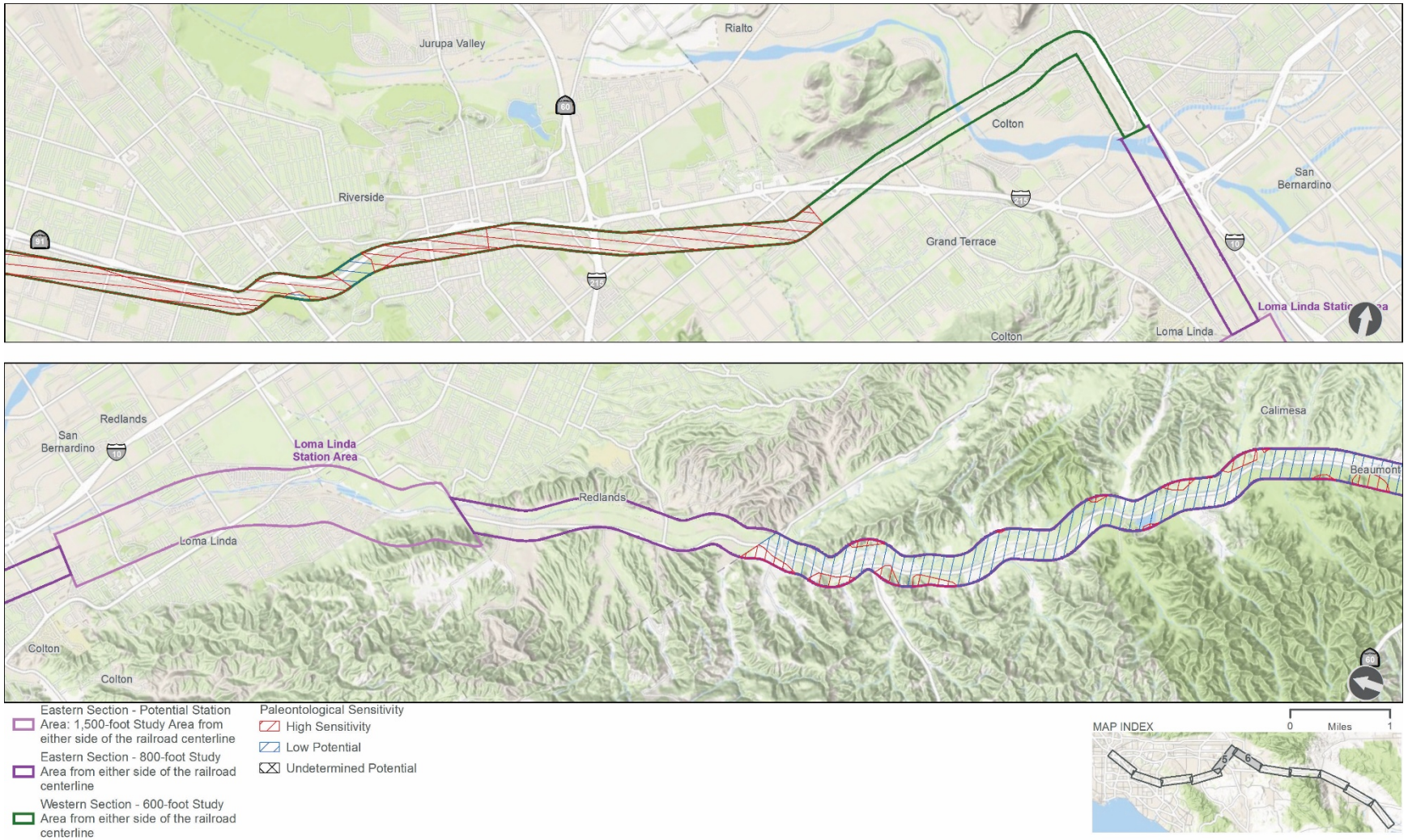

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Figure 3.10-2. Paleontological Sensitivity within the Tier 1/Program EIS/EIR Study Area

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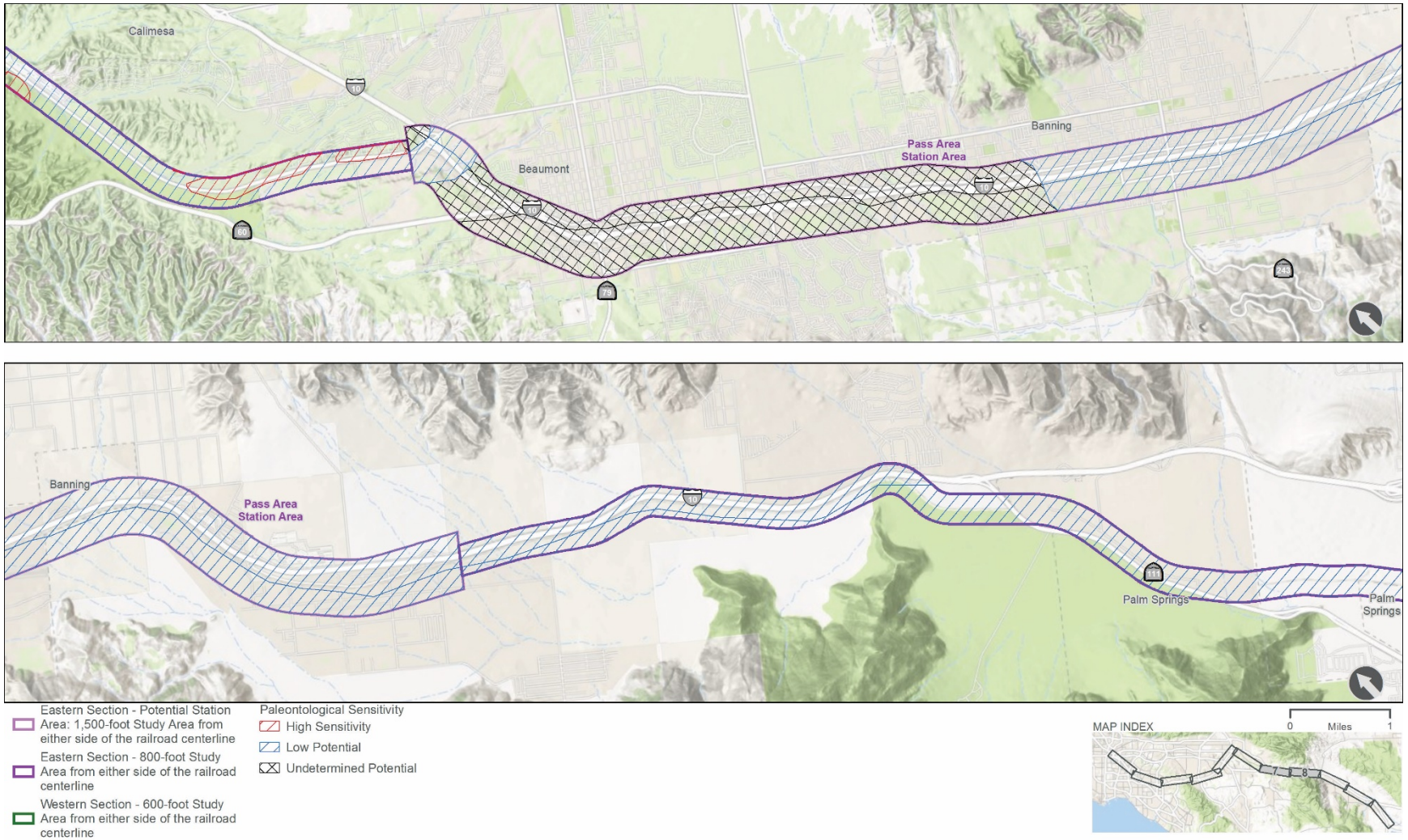

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Figure 3.10-2. Paleontological Sensitivity within the Tier 1/Program EIS/EIR Study Area

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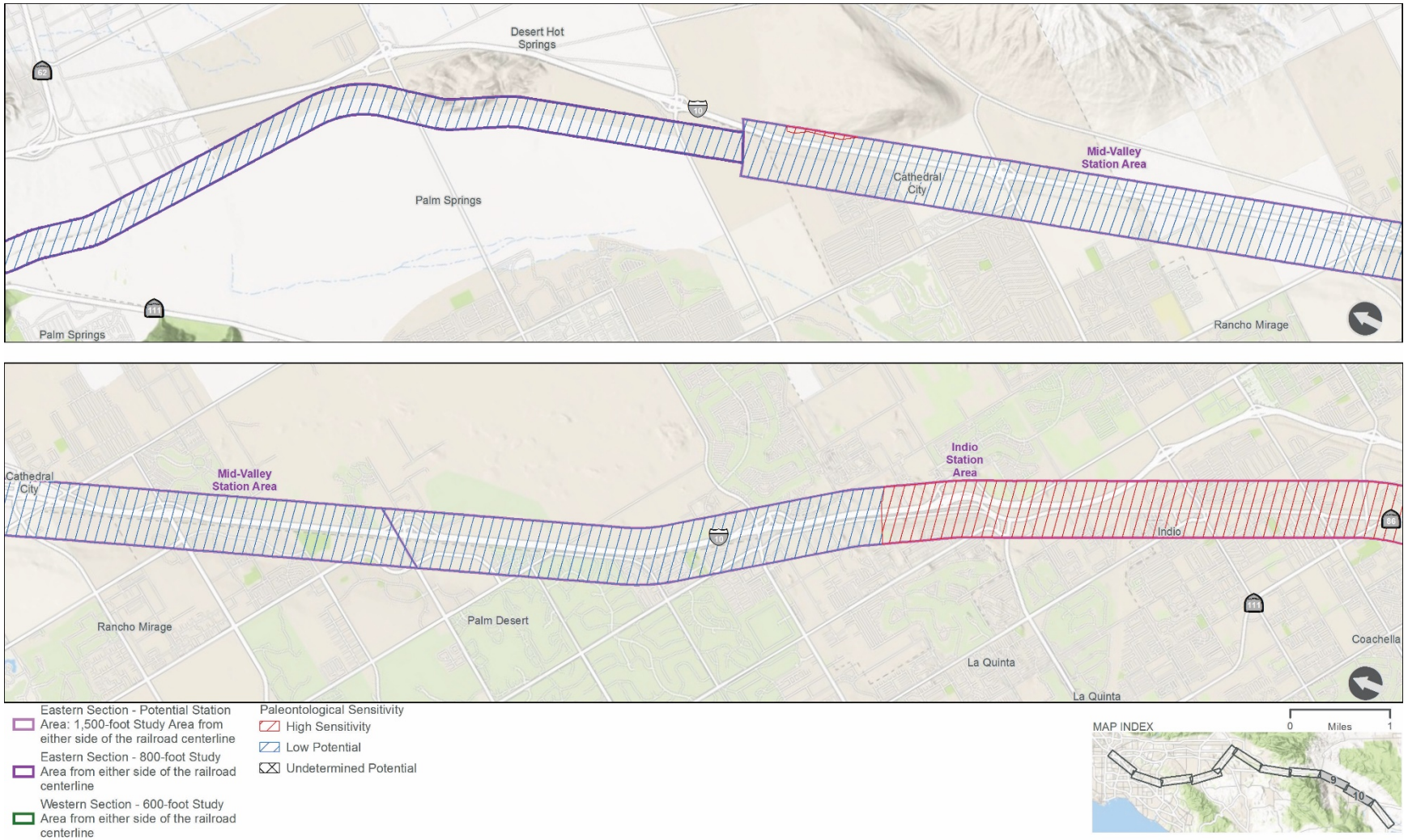

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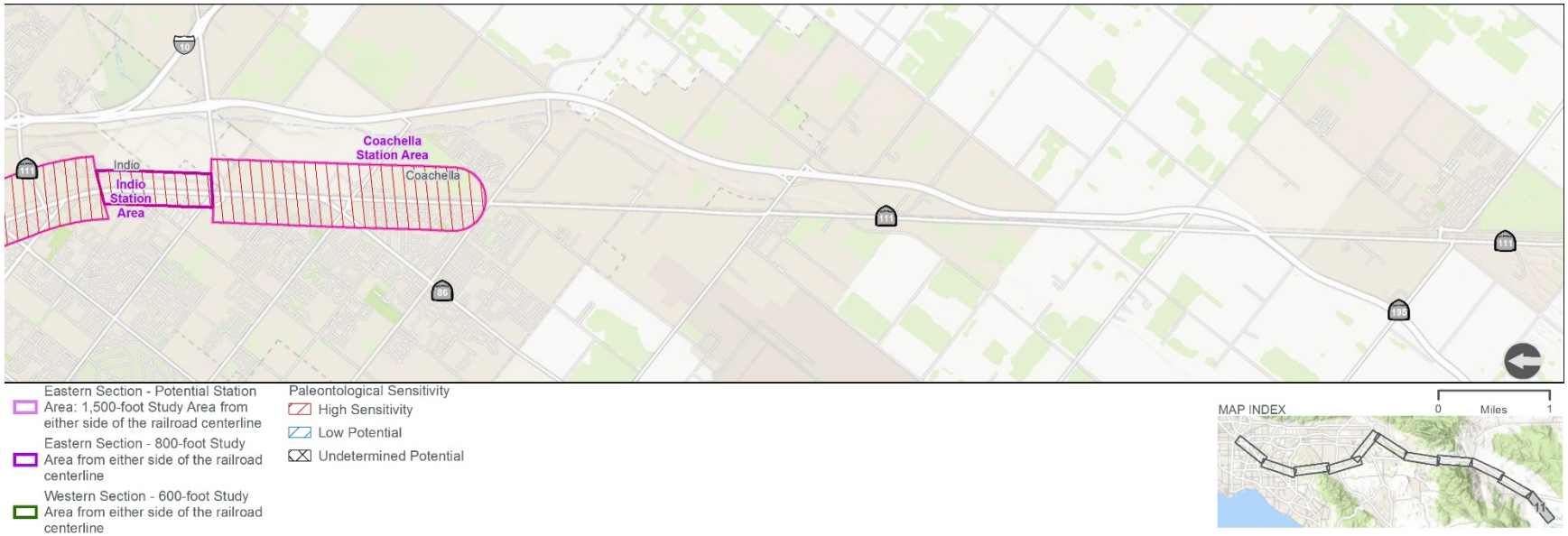
Figure 3.10-2. Paleontological Sensitivity within the Tier 1/Program EIS/EIR Study Area

(Sheet 6 of 6)



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Build Alternative Option 1 (Coachella Terminus)

For the Western Section of Build Alternative Option 1, approximately 3,146.30 acres were identified as areas mapped as having high paleontological sensitivity. For the Eastern Section of Build Alternative Option 1, approximately 1,772.31 acres were identified as areas mapped as having high paleontological sensitivity. Table 3.10-4 provides a summary of high, low, and undetermined paleontological sensitivity zones within Build Alternative Option 1.

Table 3.10-4. Summary of Paleontological Sensitivity Zones (Build Alternative Option 1)

Paleontological Sensitivity Zone	Area of Zone within Western Section (acres)	Area of Zone within Eastern Section (acres)	Total Area of Zone (acres)
High	3,146.30	1,772.31	**4,918.61**
Low	364.80	13,404.10	**13,768.90**
Undetermined	2.49	2,279.15	**2,281.64**

Build Alternative Option 2 (Indio Terminus)

Table 3.10-5 provides a summary of paleontological resource zones within Build Alternative Option 2. There are fewer acres of paleontological resource zones within Build Alternative Option 2 because of the shorter route alignment and reduced station options.

Table 3.10-5. Summary of Paleontological Sensitivity Zones (Build Alternative Options 2 and 3)

Paleontological Sensitivity Zone	Area of Zone within Western Section (acres)	Area of Zone within Eastern Section (acres)	Total Area of Zone (acres)
High	3,146.30	706.77	**3,853.07**
Low	364.80	13,404.10	**13,768.90**
Undetermined	2.49	2,279.15	**2,281.64**

Build Alternative Option 3 (Indio Terminus with Limited Third Track)

Potential paleontological sensitivity areas within Build Alternative Option 3 are the same as Build Alternative Option 2.

Mineral Resources

Minerals are defined as any naturally occurring chemical elements or compounds, formed from inorganic processes and organic substances. Mineable minerals or an ore deposit is defined as a deposit of ore or mineral having a value materially in excess of the cost of developing, mining, and processing the mineral and reclaiming the project area. The conservation, extraction, and processing of mineral resources are an integral part of development and economy within Southern California.

The CGS provides information about California's non-fuel mineral resources and classifies lands throughout the state that contain regionally significant mineral resources, as mandated by the Surface Mining and Reclamation Act. Non-fuel mineral resources include metals such as gold, silver, iron, and copper; industrial metals such as boron compounds, rare-earth elements, clays, limestone, gypsum, salt, and dimension stone; and construction aggregate such as sand, gravel, and crushed stone. Development generally results in a demand for minerals, especially construction aggregate.

The classification of these mineral resources is a joint effort of the state and the local governments and is based on geologic factors and requires that the State Geologist classify the mineral resources area as one of the four MRZs, as summarized in Table 3.10-6.

Table 3.10-6. Mineral Resource Zone Ratings

MRZ	Definition
MRZ-1	Areas where adequate information indicates that no significant mineral deposits are present or likely to be present
MRZ-2	Areas where adequate information indicates that significant mineral deposits are present or a high likelihood exists for their presence Subcategory MRZ-2a indicates measured/indicated mineral resource reserves, while Subcategory MRZ-2b indicates inferred mineral resources
MRZ-3	Areas where the significance of mineral deposits cannot be determined from available data
MRZ-4	Areas where available information is inadequate for assignment to any other MRZ designation

Source: USGS 2020

Notes:
MRZ=mineral resource zone

As shown on Figure 3.10-3, the Tier 1/Program EIS/EIR Study Area traverses multiple MRZs.

Figure 3.10-3. Mineral Resource Zones within the Tier 1/Program EIS/EIR Study Area

(Sheet 1 of 6)

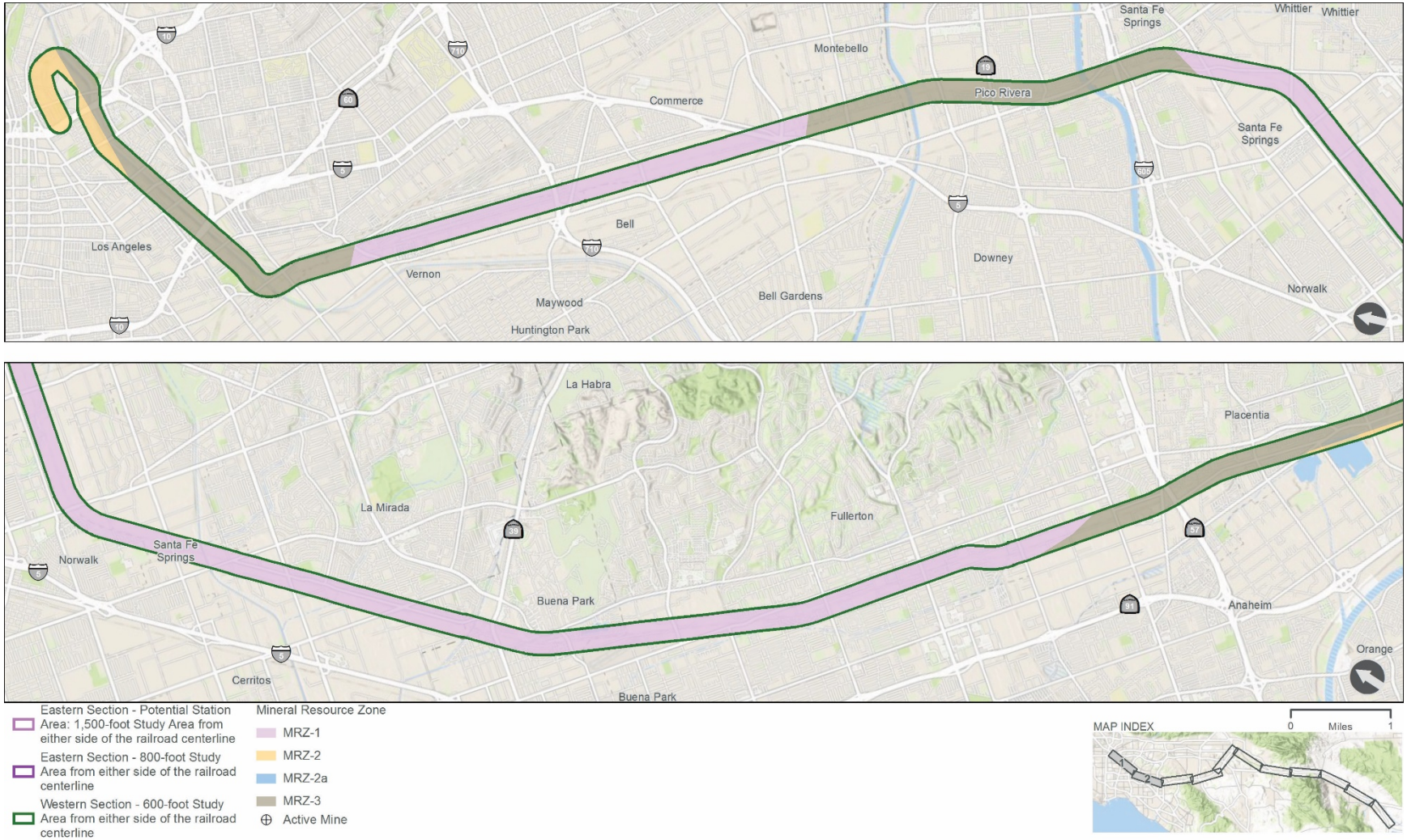

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Figure 3.10-3. Mineral Resource Zones within the Tier 1/Program EIS/EIR Study Area

(Sheet 2 of 6)

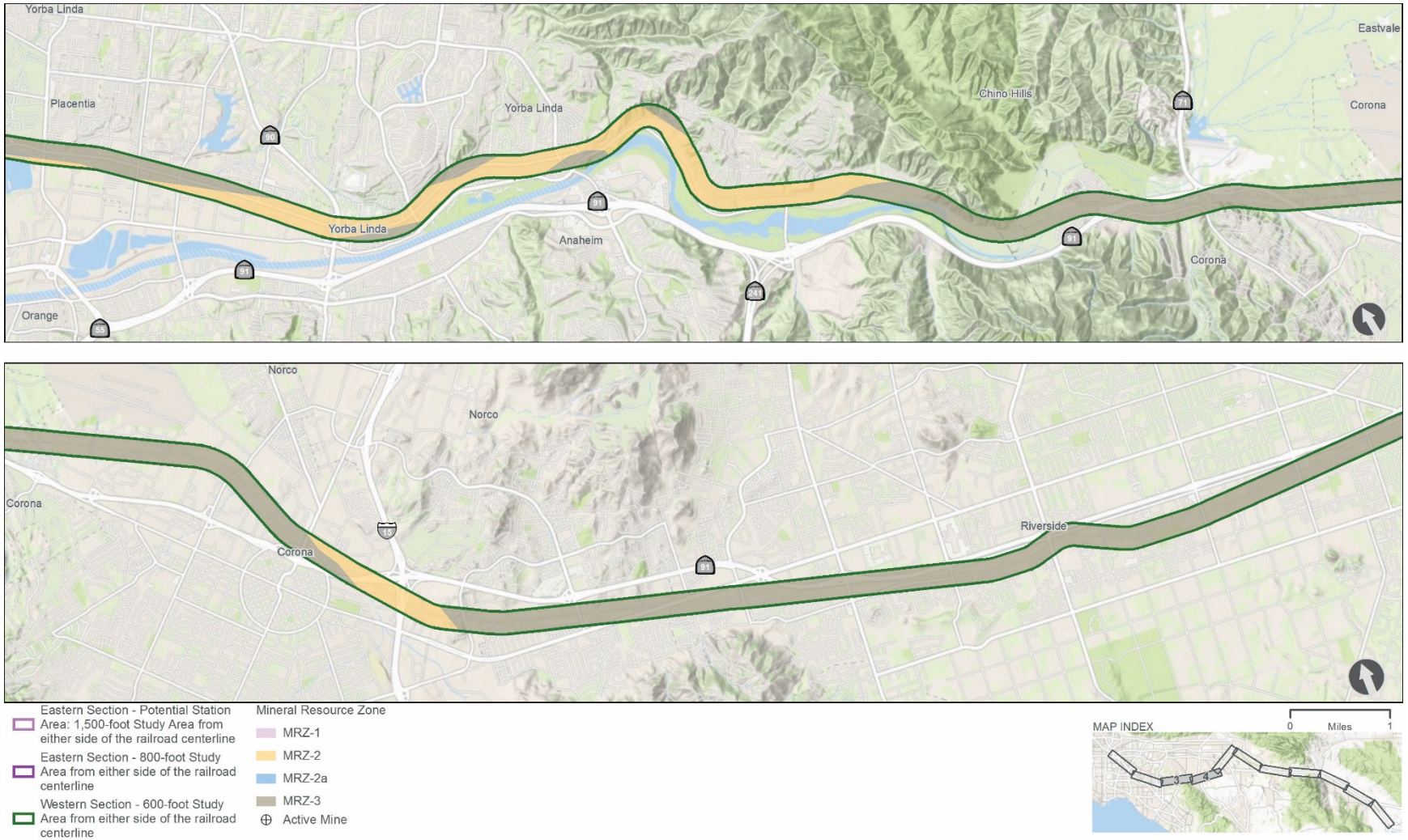

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Figure 3.10-3. Mineral Resource Zones within the Tier 1/Program EIS/EIR Study Area

(Sheet 3 of 6)

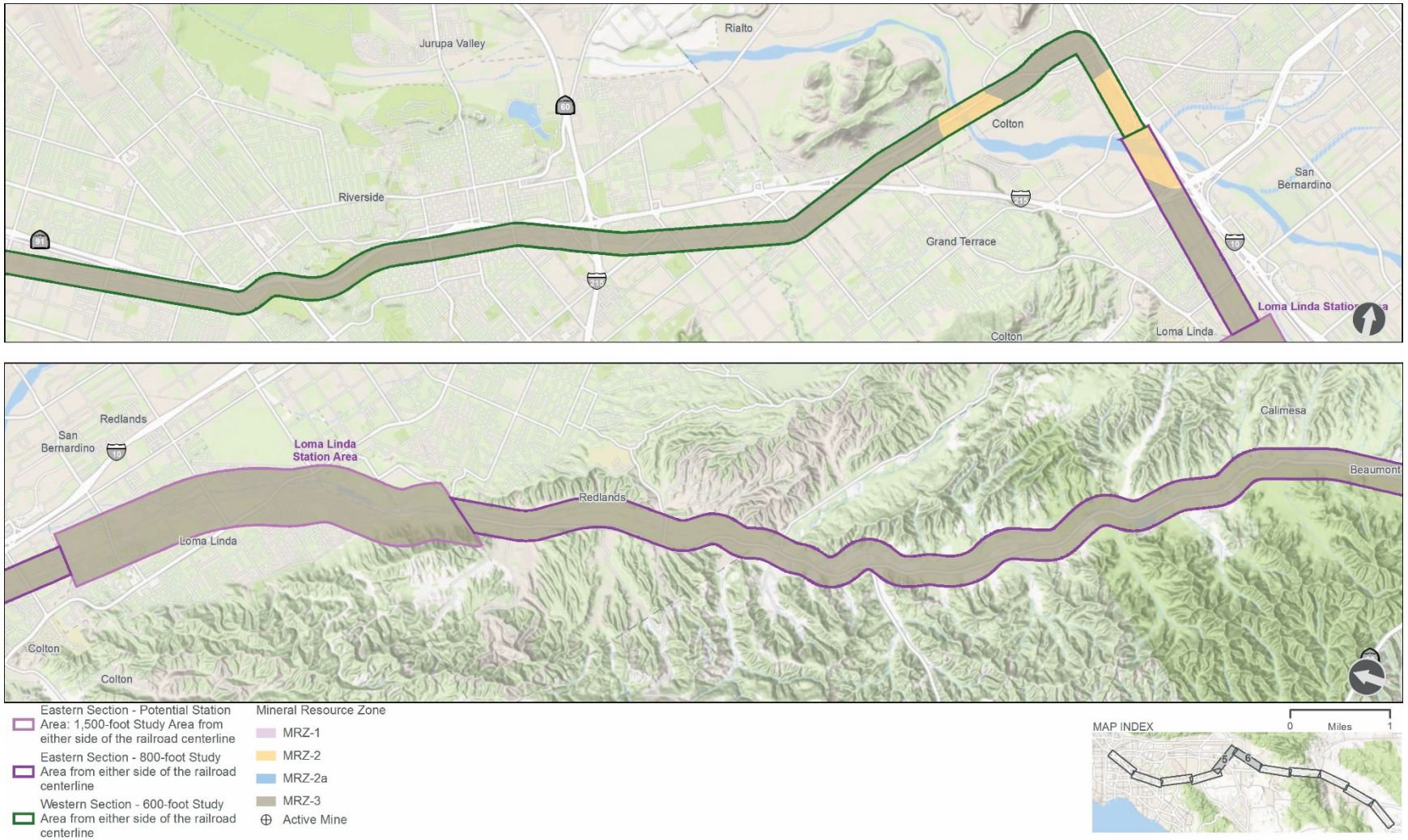

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Figure 3.10-3. Mineral Resource Zones within the Tier 1/Program EIS/EIR Study Area

(Sheet 4 of 6)

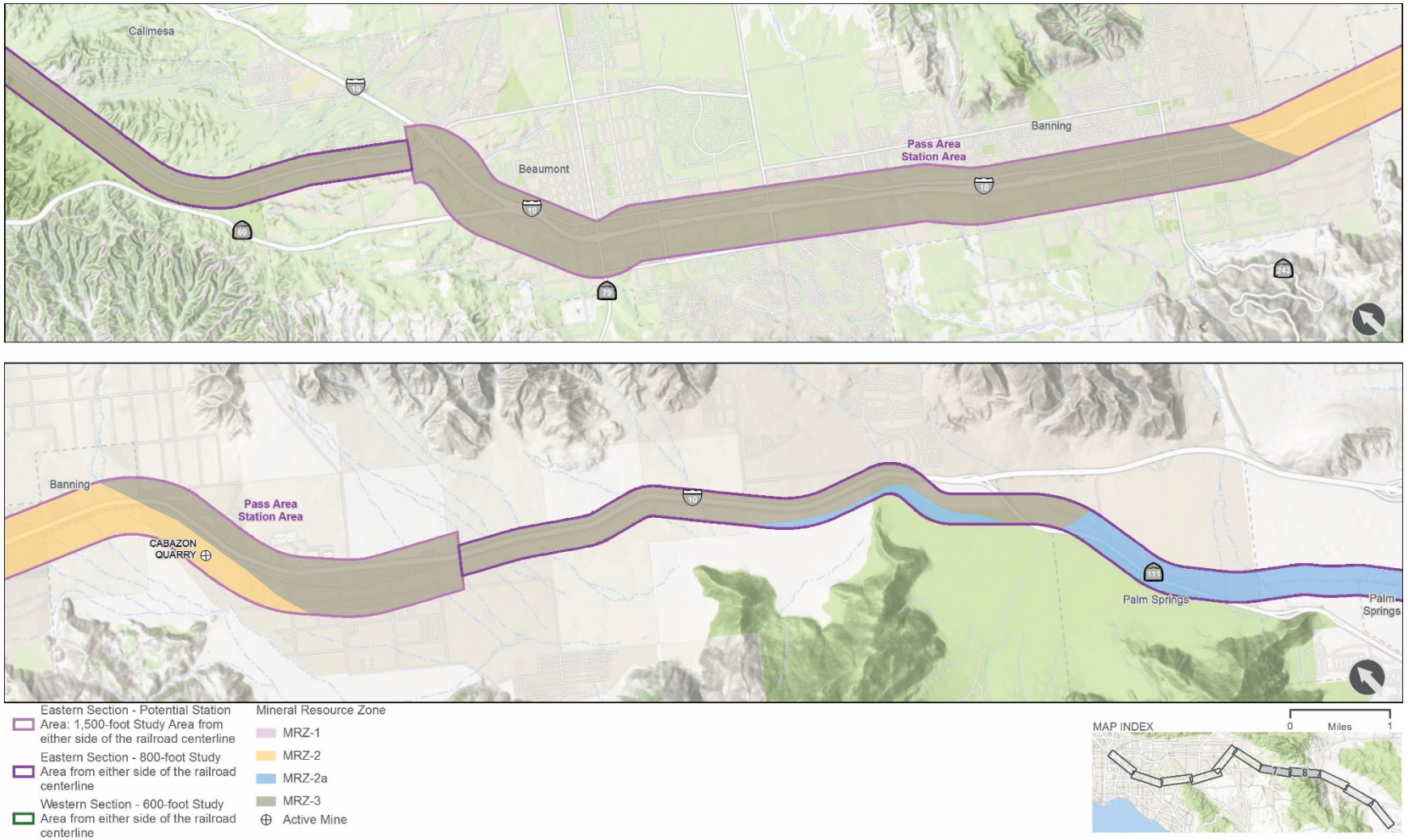

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Figure 3.10-3. Mineral Resource Zones within the Tier 1/Program EIS/EIR Study Area

(Sheet 5 of 6)

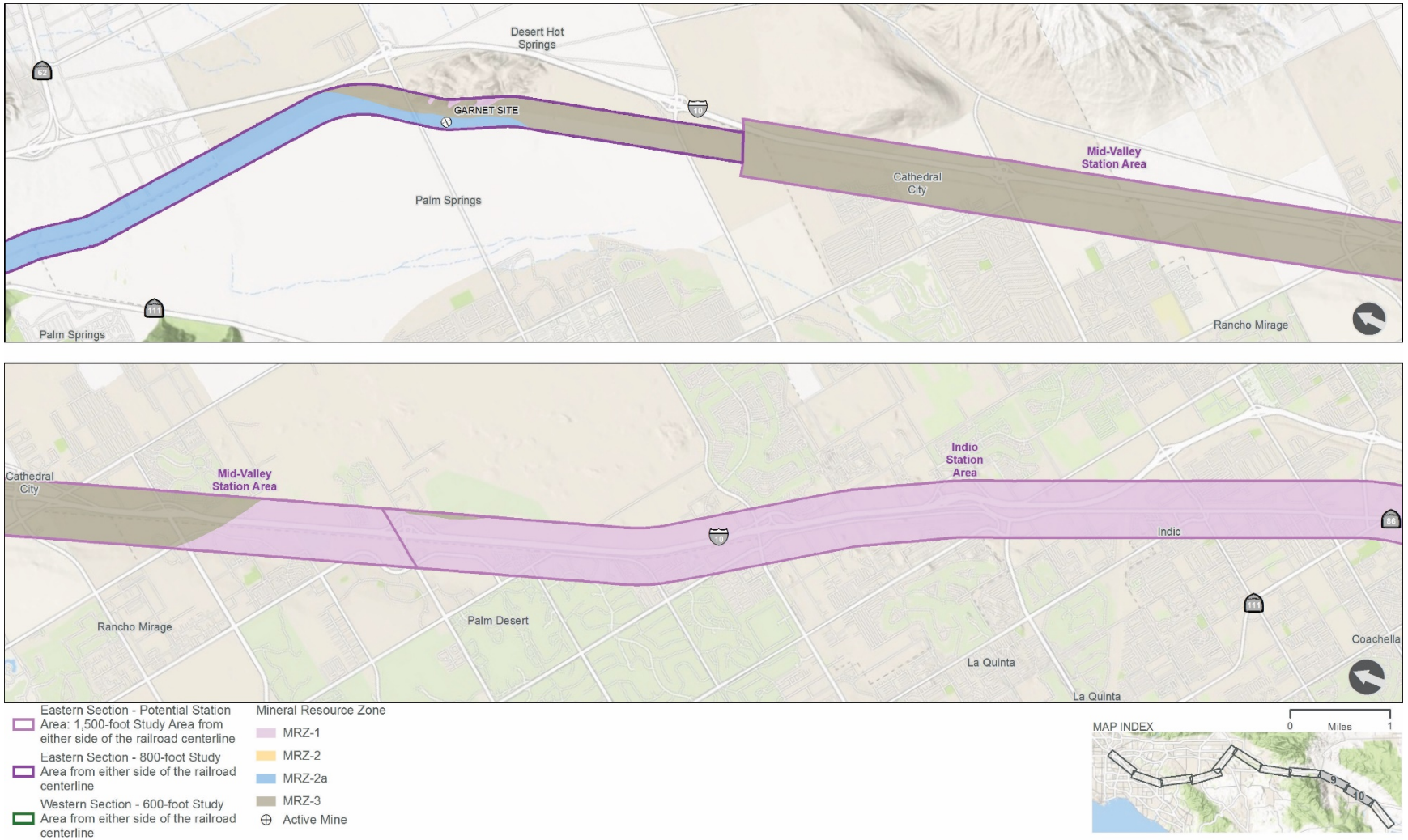

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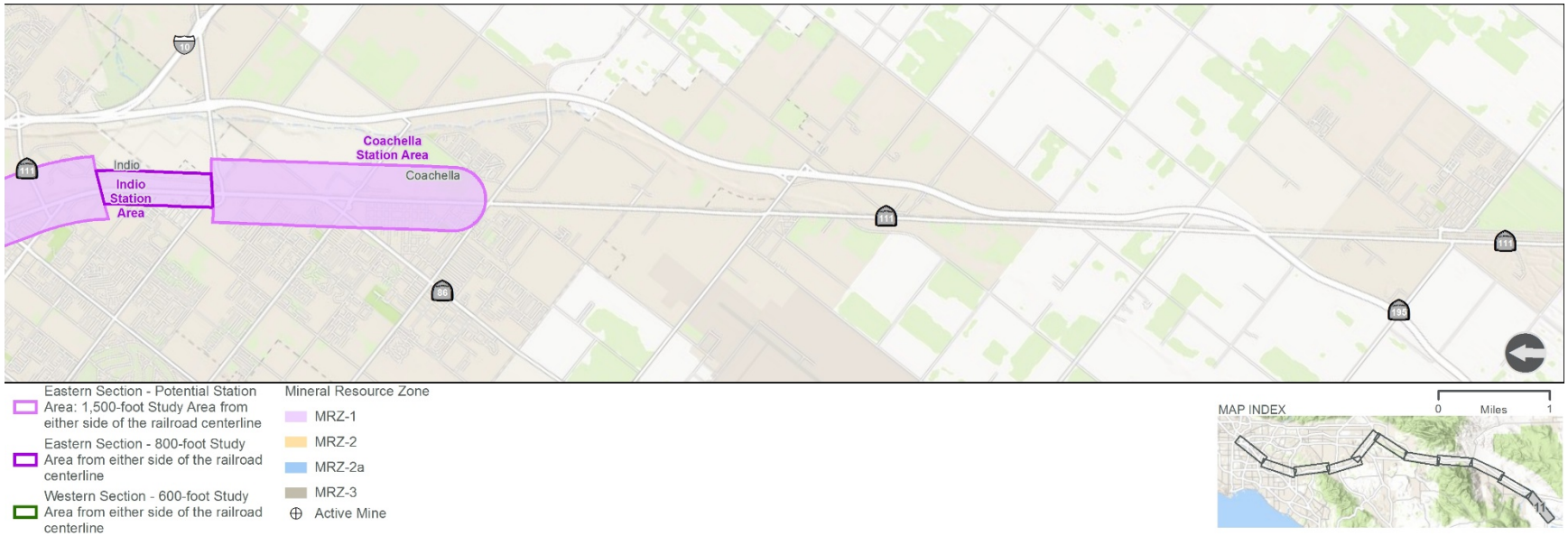
Figure 3.10-3. Mineral Resource Zones within the Tier 1/Program EIS/EIR Study Area

(Sheet 6 of 6)



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Build Alternative Option 1 (Coachella Terminus)

For the Western Section of Build Alternative Option 1, the largest type of MRZ mapped land is MRZ-3 (5,911.9 acres). Other land mapped as MRZ-1 and MRZ-2 are also present within the Western Section. For the Eastern Section of Build Alternative Option 1, the largest type of MRZ mapped land is MRZ-3 (13,550.5 acres). Other land mapped as MRZ-1 and MRZ-2 are also present within the Eastern Section.

Two active mines are identified within the Eastern Section: the Cabazon Quarry and the Garnet Site. As shown on Figure 3.10-3, the Cabazon Quarry, owned and operated by Robertson's Ready Mix, is located within the Pass Area Station Area with the primary mineral resources mined being sand and gravel. The Garnet Site, owned and operated by Granite Construction Company, is located between the Pass Area Station Area and Mid-Valley Station Area with the primary mineral resources mined being sand and gravel. Table 3.10-7 provides a summary of MRZs within Build Alternative Option 1.

Table 3.10-7. Summary of Mineral Resource Zones (Build Alternative Option 1)

MRZ	Area of Zone within Western Section (acres)	Area of Zone within Eastern Section (acres)	Total Area of Zone (acres)
MRZ-1	2,660.2	5,445.7	**8,105.8**
MRZ-2	1,535.0	2,654.3	**4,189.3**
MRZ-3	5,911.9	13,550.5	**19,462.4**
MRZ-4	0.0	0.0	**0.0**

Source: USGS 2020

Notes:
MRZ=mineral resource zone

Build Alternative Option 2 (Indio Terminus)

For the Western Section of Build Alternative Option 2, the largest type of MRZ mapped land is MRZ-3 (5,911.9 acres). Other land mapped as MRZ-1 and MRZ-2 are also present within the Western Section. For the Eastern Section of Build Alternative Option 1, the largest type of MRZ mapped land is MRZ-3 (13,550.5 acres). Other land mapped as MRZ-1 and MRZ-2 are also present within the Eastern Section.

Two active mines are identified within the Eastern Section: the Cabazon Quarry and the Garnet Site. Table 3.10-8 provides a summary of MRZs within Build Alternative Option 2.

There are fewer acres of MRZs within Build Alternative Option 2 because of the shorter route alignment and reduced station options.

Table 3.10-8. Summary of Mineral Resource Zones (Build Alternative Options 2 and 3)

MRZ	Area of MRZ within Western Section (acres)	Area of MRZ within Eastern Section (acres)	Total Area of MRZ (acres)
MRZ-1	2,660.2	4574.9	**7,235.1**
MRZ-2	1,535.0	2,654.3	**4,189.3**
MRZ-3	5,911.9	13,550.5	**19,462.4**
MRZ-4	0.0	0.0	**0.0**

Source: USGS 2020

Notes:

MRZ=mineral resource zone

Build Alternative Option 3 (Indio Terminus with Limited Third Track)

MRZs within Build Alternative Option 3 (Table 3.10-8) are the same as Build Alternative Option 2.

3.10.5 Environmental Consequences

Overview

Effects as a result of implementing the Build Alternative Options can be broadly classified into construction and operational effects. Long-term or permanent effects and short-term or temporary effects related to geology, soils, seismicity, mineral resources, and paleontological resources would be anticipated as a result of constructing any of the Build Alternative Options.

Most effects related to geology, soils, mineral resources, and paleontological resources would occur during construction when the ground is disturbed, and grading and excavation activities could result in impacts on buried resources. Potential impacts resulting from seismic activity in the Tier 1/Program EIS/EIR Study Area would be more likely to occur during operation over the course of the Program's lifespan.

No Build Alternative

The No Build Alternative, as described in Chapter 2, Program Alternatives, is used as the baseline for comparison. The No Build Alternative would not implement the Program associated with this service-level evaluation. Because no physical changes associated with the Program would occur, no

effects on geology, soils, seismicity, and paleontological and mineral resources are anticipated under the No Build Alternative. However, due to the seismic nature of Southern California, geologic hazards such as seismically induced fault rupture, ground shaking, landslides, and liquefaction may still occur under the No Build Alternative.

Build Alternative Options 1, 2, and 3

Seismic/Geologic Hazard Effects

CONSTRUCTION

Western Section. The Build Alternative Options would not require construction of additional rail or station infrastructure in the Western Section of the Program Corridor because the existing railroad ROW, and stations from LAUS to Colton would be used. When compared with the No Build Alternative, effects would be negligible because no additional construction activities are planned within the Western Section under Build Alternative Options 1, 2, and 3.

Eastern Section. Construction of Build Alternative Option 1, 2, or 3 in the Eastern Section of the Program Corridor would require the construction of rail stations, reconfiguration of existing or creation of new rail facilities, and potential ROW acquisition. If a passenger rail system is constructed and operated within the existing rail ROW, no ROW acquisitions would be required. However, the Tier 1/Program EIS/EIR Study Area allows for infrastructure and station facilities to be located beyond the limits of the existing rail ROW, which would require acquisition of land that could be within a potential seismic or geologic hazard zone.

Soil types and geologic formations are indications of stability for Program infrastructure and facilities and longevity of service. Soils with high clay content often have high shrink/swell potential and are generally poorly suited for railway, road, or foundation bases. Such soils may need to be excavated and replaced prior to construction or treated in place to limit effects on proposed structures. Construction activities may also disturb or modify soils and slopes and must be managed through standard engineering practices and design to avoid and minimize potential risk. Additionally, some portions of the Eastern Section traverse areas with moderate to high susceptibility to landslides and liquefaction.

While applicable building codes and design features to address potential seismic or geologic hazards would be adhered to and developed, potential effects depend on where the infrastructure improvements, including new stations, which have not yet been selected, would be located. Which properties would be affected by the future construction and operation of a passenger rail system, and to what extent, cannot be determined at this time. The Tier 2/Project-level analysis would

evaluate the selected site and proposed infrastructure improvement or station facility and whether people or structures are exposed to increased seismic or geologic hazard risk.

When compared with the No Build Alternative, Build Alternative Option 1 could have a moderate effect associated with seismic or geologic hazard zones within the Eastern Section of the Program Corridor. When compared with Build Alternative Option 1, Build Alternative Option 2 may have slightly reduced effects due to a smaller footprint associated with a shorter route alignment and reduced station options; however, the magnitude of effects would be similar and would be considered moderate when compared with the No Build Alternative. When compared with Build Alternative Options 1 or 2, Build Alternative Option 3 may have slightly reduced effects due to a smaller footprint associated with a shorter route alignment, reduced station options, and reduced third track rail infrastructure. However, the magnitude of effects would be similar for Build Alternative Option 3 and would be considered moderate when compared with the No Build Alternative.

OPERATION

Western Section. Operation of Build Alternative Option 1, 2, or 3 within the Western Section would not result in new effects associated with seismic or geologic hazards, as the additional train trips would travel within an existing railroad ROW. When compared with the No Build Alternative, effects associated with seismic or geologic hazards would be negligible because no additional infrastructure improvements are planned within the Western Section under Build Alternative Options 1, 2, and 3.

Eastern Section. The Build Alternative Options cross AP fault zones capable of ground rupture and would be generally susceptible to earthquakes resulting in ground shaking. Additionally, some portions of the Eastern Section traverse areas with moderate to high susceptibility to landslides and liquefaction. Operation would comply with federal, state, and, local design and safety criteria regarding structural integrity to protect the public and property from geologic, soil, and seismic hazards. The Tier 2/Project-level analysis would evaluate site-specific impacts associated with seismic or geologic hazard areas and whether operation of a facility would result in effects on the public.

When compared with the No Build Alternative, Build Alternative Option 1 could have a moderate effect on seismic or geologic hazards within the Eastern Section of the Program Corridor. When compared with Build Alternative Option 1, Build Alternative Option 2 would have slightly reduced effects due to a shorter route alignment and reduced station options. However, the magnitude of effects would be similar and would be considered moderate when compared with the No Build Alternative. When compared with Build Alternative Options 1 2, Build Alternative Option 3 may have slightly reduced effects due to a smaller footprint associated with a shorter route alignment, reduced station options, and reduced third track rail infrastructure. However, the magnitude of effects would

be similar for Build Alternative Option 3 and would be considered moderate when compared with the No Build Alternative.

Paleontological Resource Effects

CONSTRUCTION

Western Section. The Build Alternative Options would not require construction of additional rail or station infrastructure in the Western Section of the Program Corridor because the existing railroad, and stations from LAUS to Colton would be used. When compared with the No Build Alternative, short-term/temporary effects associated with the paleontological resources would be negligible because no additional construction activities are planned within the Western Section under Build Alternative Options 1, 2, and 3.

Eastern Section. Construction of Build Alternative 1, 2, or 3 in the Eastern Section of the Program Corridor would require the construction of rail stations, reconfiguration of existing or creation of new rail facilities, and potential ROW acquisition. These construction activities could occur in areas identified as having undetermined or high paleontological sensitivity. Direct physical effects on paleontological resources may include damage or destruction during ground-disturbing activities associated with construction of rail infrastructure improvements or station facilities.

Excavation of the sediments within a high paleontological sensitivity area could destroy or degrade the condition of the fossil. Additionally, the nature of excavation activities would cause any fossils to be removed from their stratigraphic context, thereby reducing the scientific usefulness of the fossil. Paleontological resources are considered a finite and unique resource. Once disturbed or removed, that resource is effectively eliminated. When compared with the No Build Alternative, Build Alternative Option 1 could have a substantial effect on paleontological resources within the Eastern Section of the Program Corridor. When compared with Build Alternative Option 1, Build Alternative Option 2 would have slightly reduced effects due to a shorter route alignment and reduced station options. However, the magnitude of effects would be similar and considered substantial when compared with the No Build Alternative. When compared with Build Alternative Options 1 or 2, Build Alternative Option 3 may have slightly reduced effects due to a smaller footprint associated with a shorter route alignment, reduced station options, and reduced third track rail infrastructure. However, the magnitude of effects would be similar for Build Alternative Option 3 and would be considered substantial when compared with the No Build Alternative. However, detailed analysis of ROW acquisition impacts would be completed in a Tier 2/Project-level analysis.

OPERATION

Western Section. Operation of Build Alternative Option 1, 2, or 3 within the Western Section would not result in new effects associated with paleontological resources, as the additional train trips would travel within an existing railroad ROW. When compared with the No Build Alternative, effects associated with paleontological resources would be negligible because no additional infrastructure improvements are planned within the Western Section under Build Alternative Options 1, 2, and 3.

Eastern Section. Once construction ceases, operation of the new railroad infrastructure and stations under the Build Alternative Options are not anticipated to result in changes associated with paleontological resources. Operational effects associated with the Eastern Section of Build Alternative Option 1 would be negligible when compared with the No Build Alternative. When compared with Build Alternative Option 1, Build Alternative Option 2 would have the same magnitude of effect and be considered negligible when compared with the No Build Alternative. When compared with Build Alternative Options 1 or 2, Build Alternative Option 3 may have slightly reduced effects due to a smaller footprint associated with a shorter route alignment, reduced station options, and reduced third track rail infrastructure. However, the magnitude of effects would be similar for Build Alternative Option 3 and would be considered negligible when compared with the No Build Alternative.

Mineral Resource Effects

CONSTRUCTION

Western Section. Operation of Build Alternative Option 1, 2, or 3 within the Western Section would not result in effects on mineral resources, as the additional train trips would travel within an existing railroad ROW. When compared with the No Build Alternative, effects on mineral resources would be negligible because no additional infrastructure improvements are planned within the Western Section under Build Alternative Options 1, 2, and 3.

Eastern Section. Construction of Build Alternative 1, 2, or 3 in the Eastern Section of the Program Corridor would require the construction of rail stations, reconfiguration of existing or creation of new rail facilities, and potential ROW acquisition. These would require the conversion of non-transportation land to a transportation use. The site-specific design that would be developed in later Program phases would determine the extent to which land use conversions occur. If the rail infrastructure or station facility is within the ROW of, or closely parallel to, an existing transportation corridor, the extent of land conversion would be minimal. However, the further rail infrastructure or a station facility departs from an existing transportation feature, the greater the likelihood for land use conversion, ranging from building on vacant/undeveloped land to potential displacement of existing structures.

If a passenger rail system is constructed and operated within the existing rail ROW, no ROW acquisitions would be required. However, the Tier 1/Program EIS/EIR Study Area allows for infrastructure and station facilities to be located beyond the limits of the existing rail ROW, which would require acquisition of land not designated for transportation uses. Which mineral resources would be affected by the future construction and operation of a passenger rail system, and to what extent, cannot be determined at this time.

If MRZ mapped lands within the Eastern Section of the Program Corridor are converted to a transportation use, it would be considered an adverse effect. Mineral resource lands are considered a finite and unique resource; once mineral resource land is converted to other uses, that resource is effectively eliminated. When compared with the No Build Alternative, Build Alternative Option 1 could have a substantial effect on mineral resources within the Eastern Section of the Program Corridor. When compared with Build Alternative Option 1, Build Alternative Option 2 would have slightly reduced effects due to a shorter route alignment and reduced station options. However, the magnitude of effects would be similar and considered substantial when compared with the No Build Alternative. When compared with Build Alternative Options 1 or 2, Build Alternative Option 3 may have slightly reduced effects due to a smaller footprint associated with a shorter route alignment, reduced station options, and reduced third track rail infrastructure. However, the magnitude of effects would be similar for Build Alternative Option 3 and would be considered substantial when compared with the No Build Alternative. However, detailed analysis of ROW acquisition impacts would be completed in a Tier 2/Project-level analysis.

OPERATION

Western Section. Operation of Build Alternative Option 1, 2, or 3 within the Western Section would not result in new effects associated with mineral resources or mineral resource sites, as the additional train trips would travel within an existing railroad ROW. When compared with the No Build Alternative, effects associated with mineral resources would be negligible because no additional infrastructure improvements are planned within the Western Section under Build Alternative Options 1, 2, and 3.

Eastern Section. Once construction ceases, operation of the new railroad infrastructure and stations under the Build Alternative Options are not anticipated to result in changes associated with mineral resources or mineral resource sites. Operational effects associated with the Eastern Section of Build Alternative Option 1 would be negligible when compared with the No Build Alternative. When compared with Build Alternative Option 1, Build Alternative Option 2 would have the same magnitude of effect and be considered negligible when compared with the No Build Alternative. When compared with Build Alternative Options 1 or 2, Build Alternative Option 3 may have slightly reduced effects due to a smaller footprint associated with a shorter route alignment, reduced station

options, and reduced third track rail infrastructure. However, the magnitude of effects would be similar for Build Alternative Option 3 and would be considered negligible when compared with the No Build Alternative.

3.10.6 NEPA Summary of Potential Effects

Table 3.10-9 through Table 3.10-11 summarizes the qualitative assessment of potential effects (negligible, moderate, or substantial) under NEPA for each of the Build Alternative Options. This service-level evaluation uses the Tier 1/Program EIS/EIR Study Area to determine the relative magnitude of potential effects on geology, soils, seismicity, paleontological resources, and mineral resources under each of the Build Alternative Options. Specific mitigation measures to reduce effects would be identified during the Tier 2/Project-level analysis.

Table 3.10-9. NEPA Summary of Effects on Seismic and Geologic Hazards

Alternative Option	Potential Intensity of Effect: Western Section	Potential Intensity of Effect: Eastern Section
No Build Alternative[a]	Construction: None Operation: None	Construction: None Operation: None
Build Alternative Option 1 (Coachella Terminus)	Construction: Negligible Operation: Negligible	Construction: Moderate Operation: Moderate
Build Alternative Option 2 (Indio Terminus)	Construction: Negligible Operation: Negligible	Construction: Moderate Operation: Moderate
Build Alternative Option 3 (Indio Terminus with Limited Third Track)	Construction: Negligible Operation: Negligible	Construction: Moderate Operation: Moderate

Notes:

[a] The No Build Alternative includes existing and potential expansion of roadway, passenger rail, and air travel facilities within the Tier 1/Program EIS/EIR Study Area; however, for the service-level evaluation, identifying levels of effect from potential expansion of those facilities is speculative and would be dependent on Project-specific analysis.

Table 3.10-10. NEPA Summary of Effects on Paleontological Resources

Alternative Option	Potential Intensity of Effect: Western Section	Potential Intensity of Effect: Eastern Section
No Build Alternative[a]	Construction: None Operation: None	Construction: None Operation: None
Build Alternative Option 1 (Coachella Terminus)	Construction: Negligible Operation: Negligible	Construction: Substantial Operation: Negligible
Build Alternative Option 2 (Indio Terminus)	Construction: Negligible Operation: Negligible	Construction: Substantial Operation: Negligible
Build Alternative Option 3 (Indio Terminus with Limited Third Track)	Construction: Negligible Operation: Negligible	Construction: Substantial Operation: Negligible

Notes:

[a] The No Build Alternative includes existing and potential expansion of roadway, passenger rail, and air travel facilities within the Tier 1/Program EIS/EIR Study Area; however, for the service-level evaluation, identifying levels of effect from potential expansion of those facilities is speculative and would be dependent on Project-specific analysis.

Table 3.10-11. NEPA Summary of Effects on Mineral Resources

Alternative Option	Potential Intensity of Effect: Western Section	Potential Intensity of Effect: Eastern Section
No Build Alternative[a]	Construction: None Operation: None	Construction: None Operation: None
Build Alternative Option 1 (Coachella Terminus)	Construction: Negligible Operation: Negligible	Construction: Substantial Operation: Negligible
Build Alternative Option 2 (Indio Terminus)	Construction: Negligible Operation: Negligible	Construction: Substantial Operation: Negligible

Alternative Option	Potential Intensity of Effect: Western Section	Potential Intensity of Effect: Eastern Section
Build Alternative Option 3 (Indio Terminus with Limited Third Track)	Construction: Negligible Operation: Negligible	Construction: Substantial Operation: Negligible

Notes:

[a] The No Build Alternative includes existing and potential expansion of roadway, passenger rail, and air travel facilities within the Tier 1/Program EIS/EIR Study Area; however, for the service-level evaluation, identifying levels of effect from potential expansion of those facilities is speculative and would be dependent on Project-specific analysis.

3.10.7 CEQA Summary of Potential Impacts

Based on the information provided in Section 3.10.4 and 3.10.5, and considering the CEQA Guidelines Appendix G Checklist questions for geology, soils, paleontological resources, and mineral resources, the Build Alternative Options would have a potentially significant impact on geology, soils, paleontological resources, and mineral resources when reviewed on a Program-wide basis. Placing the infrastructure improvements and new stations largely within or along the existing ROW reduces the potential for significant impacts on these resources; however, because the sites have not been selected, some resources may be significantly impacted. At the programmatic analysis level, it is not possible to know the location, extent, and characteristics of impacts on these resources. Proposed programmatic mitigation strategies discussed in Section 3.10.8 would be applied to reduce potential impacts.

Table 3.10-12 summarizes the CEQA significance conclusions for the Build Alternative Options; the proposed programmatic mitigation strategies that could be applied to minimize, reduce, or avoid the potential impacts; and the significance determination after mitigation strategies are applied. The identification and implementation of additional site-specific mitigation measures necessary for Project implementation would occur as part of the Tier 2/Project-level analysis.

Table 3.10-12. CEQA Summary of Impacts for Geology, Soils, and Mineral Resources

Impact Summary	Mitigation Strategy	Significance with Mitigation Strategy
Would the Program directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury or death involving rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault?		
Construction		
Western Section – No Impact. No construction impacts are anticipated at the Tier 1/Program EIS/EIR evaluation level under Build Alternative Option 1, 2, or 3 because no physical improvements are proposed or required within the Western Section.	Not applicable	Not applicable
Eastern Section – Potentially Significant. Potential exposure to seismic hazards during construction activities are dependent on the location of rail infrastructure improvements and station facilities, which are currently unknown. Build Alternative Options 1, 2, and 3 cross areas where identified earthquake faults and AP fault zones are present; therefore, there is potential for significant impacts. The Tier 2/Project-level analysis would evaluate the potential of seismic risk and whether people or structures would be exposed to significant seismic risk during construction activities.	GEO-1	**Less than Significant.** GEO-1 would minimize, reduce, or avoid potential impacts associated with construction activities within areas containing potential seismic hazards through design and further analysis during the Tier 2/Project-level environmental process.
Operation		
Western Section – Less Than Significant. The Western Section of the Program Corridor is subject to seismic ground shaking due to the existing geologic conditions in Southern California. The increased train service (two additional round-trip daily trains within the Program Corridor) would not change existing land use and would not result in new seismic hazards to the public or the environment. Therefore, a less than significant impact under Build Alternative Option 1, 2, or 3 is anticipated at the Tier 1/Program EIS/EIR evaluation level.	Not applicable	Not applicable

Impact Summary	Mitigation Strategy	Significance with Mitigation Strategy
Eastern Section – Potentially Significant. Once construction ceases, operation of the new railroad infrastructure and stations under the Build Alternative Options are not anticipated to result in changes associated with seismic hazard zones. However, the operation of new station facilities within seismic hazard zones could result in an increased seismic hazard risks to people or structures in the area; therefore, there is potential for significant impacts. The Tier 2/Project-level analysis would evaluate the potential for people or structures to be exposed to seismic hazards during operation.	LU-3	**Less than Significant.** LU-3 would minimize, reduce, or avoid potential impacts on people and structures resulting from seismic hazards through design and further analysis during the Tier 2/Project-level environmental process.
Would the Program directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury or death involving strong seismic ground shaking?		
Construction		
Western Section – No Impact. Although the Western Section of the Program Corridor would be subject to seismic ground shaking, no construction impacts are anticipated at the Tier 1/Program EIS/EIR evaluation level under Build Alternative Option 1, 2, or 3 because no physical improvements are proposed or required within the Western Section.	Not applicable	Not applicable
Eastern Section – Potentially Significant. Potential exposure to strong seismic shaking during construction activities are dependent on the location of rail infrastructure improvements and station facilities, which are currently unknown. Build Alternative Options 1, 2, and 3 cross areas where strong seismic shaking could occur; therefore, there is potential for significant impacts. The Tier 2/Project-level analysis would evaluate the potential of seismic risk and whether people or structures would be exposed to significant seismic risk during construction activities.	GEO-1	**Less than Significant.** GEO-1 would minimize, reduce, or avoid potential impacts associated with construction activities within areas subject to strong seismic ground shaking through design and further analysis during the Tier 2/Project-level environmental process.

Impact Summary	Mitigation Strategy	Significance with Mitigation Strategy
Operation		
Western Section – Less Than Significant. The Western Section of the Program Corridor is subject to seismic ground shaking due to the existing geologic conditions in Southern California. The increase in train service (two additional round-trip daily trains within the Program Corridor) would not change existing land use and would not result in new seismic hazards to the public or the environment. Therefore, a less than significant impact under Build Alternative Option 1, 2, or 3 is anticipated at the Tier 1/Program EIS/EIR evaluation level.	Not applicable	Not applicable
Eastern Section – Potentially Significant. Once construction ceases, operation of the new railroad infrastructure and stations under the Build Alternative Options are not anticipated to result in changes associated with seismic hazard zones. However, the operation of new station facilities within seismic hazard zones could result in an increased seismic hazard risks to people or structures in the area; therefore, there is potential for significant impacts. The Tier 2/Project-level analysis would evaluate the potential for people or structures to be exposed to seismic hazards during operation.	LU-3	**Less than Significant.** LU-3 would minimize, reduce, or avoid potential impacts on people and structures resulting from seismic hazards through design and further analysis during the Tier 2/Project-level environmental process.
Would the Program directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury or death involving seismic-related ground failure, including liquefaction?		
Construction		
Western Section – No Impact. No construction impacts are anticipated at the Tier 1/Program EIS/EIR evaluation level under Build Alternative Option 1, 2, or 3 because no physical improvements are proposed or required within the Western Section.	Not applicable	Not applicable

Impact Summary	Mitigation Strategy	Significance with Mitigation Strategy
Eastern Section – Potentially Significant. Potential impacts from seismic-related ground failure are dependent on the location of rail infrastructure improvements and station facilities, which are currently unknown. Numerous faults and areas of high susceptibility to liquefaction are located within Build Alternative Options 1, 2, and 3. These seismic hazard areas would be considered during design with proposed infrastructure and structures required to adhere to all California Building Code requirements to address seismic safety. However, until a site-specific Project is identified, it is unknown if impacts would be significant. The Tier 2/Project-level analysis would identify and analyze site-specific impacts associated with seismic-related ground failure.	GEO-1	**Less than Significant.** GEO-1 would minimize, reduce, or avoid potential impacts related to seismic-related ground failure through design and further analysis during the Tier 2/Project-level environmental process.
Operation		
Western Section – No Impact. The increase in train service (two additional round-trip daily trains within the Program Corridor) would not change existing land use and would not result in an exacerbation of liquefaction risks or hazards. Therefore, no impacts are anticipated at the Tier 1/Program EIS/EIR evaluation level under Build Alternative Option 1, 2, or 3.	Not applicable	Not applicable
Eastern Section – No Impact. Once construction ceases, operation of the new railroad infrastructure and stations under the Build Alternative Options are not anticipated to result in changes associated with liquefaction conditions. Therefore, no impacts are anticipated at the Tier 1/Program EIS/EIR evaluation level under Build Alternative Option 1, 2, or 3.	Not applicable	Not applicable

Impact Summary	Mitigation Strategy	Significance with Mitigation Strategy
Would the Program directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury or death involving landslides?		
Construction		
Western Section – No Impact. No construction impacts are anticipated at the Tier 1/Program EIS/EIR evaluation level under Build Alternative Option 1, 2, or 3 because no physical improvements are proposed or required within the Western Section.	Not applicable	Not applicable
Eastern Section – Potentially Significant. Potential construction impacts resulting from landslides are dependent on the location of rail infrastructure improvements and station facilities, which are currently unknown. For construction activities that would occur in areas of high landslide susceptibility, there is an increased risk of landslide impacts due to increased human activity (e.g., movement of soils). The Tier 2/Project-level analysis would evaluate the potential of landslide risk and whether people or structures would be exposed to significant landslide risk during construction activities.	GEO-1	**Less than Significant.** GEO-1 would minimize, reduce, or avoid potential impacts related to landslide hazards through design and further analysis during the Tier 2/Project-level environmental process.
Operation		
Western Section – No Impact. The increase in train service (two additional round-trip daily trains within the Program Corridor) would not change existing land use and would not result in an exacerbation of landslide risks or hazards. Therefore, no operational impacts are anticipated at the Tier 1/Program EIS/EIR evaluation level under Build Alternative Option 1, 2, or 3.	Not applicable	Not applicable

Impact Summary	Mitigation Strategy	Significance with Mitigation Strategy
Eastern Section – Potentially Significant. Once construction ceases, operation of the new railroad infrastructure and stations under Build Alternative Option 1, 2, or 3 are not anticipated to result in changes associated with landslide hazard zones. However, the operation of new station facilities within landslide hazard zones could result in an increased landslide risk to people or structures in the area; therefore, there is potential for significant impacts. The Tier 2/Project-level analysis would evaluate the potential for people or structures to be exposed to landslide risk during operation.	LU-3	**Less than Significant.** LU-3 would minimize, reduce, or avoid potential impacts on people and structures resulting from landslides through design and further analysis during the Tier 2/Project-level environmental process.
Would the Program result in substantial soil erosion or the loss of topsoil?		
Construction		
Western Section – No Impact. No construction impacts anticipated at the Tier 1/Program EIS/EIR evaluation level under Build Alternative Option 1, 2, or 3 because no physical improvements are proposed or required within the Western Section.	Not applicable	Not applicable
Eastern Section – Potentially Significant. Construction activities associated with rail infrastructure improvements or station facilities under Build Alternative Option 1, 2, or 3 would include clearing, grading, and excavation, which have the potential to result in soil erosion; therefore, there is potential for significant impacts. The Tier 2/Project-level analysis would identify and evaluate impacts associated with site-specific drainage patterns changes and the potential for site-specific construction activities to result in soil erosion and loss of topsoil.	HWQ-2 LU-3	**Less than Significant.** HWQ-2 and LU-3 would minimize, reduce, or avoid potential impacts related to soil erosion or topsoil loss by requiring compliance with applicable regulations. BMPs would be identified to minimize, reduce or, avoid potential impacts from erosion or siltation.

Impact Summary	Mitigation Strategy	Significance with Mitigation Strategy
Operation		
Western Section – No Impact. The increase in train service (two additional round-trip daily trains within the Program Corridor) on an existing rail corridor would require maintenance of existing infrastructure. However, these maintenance activities do not require the alteration of existing drainage patterns or the addition of new impervious surfaces. Therefore, no impacts associated with soil erosion or loss of topsoil are anticipated at the Tier 1/Program EIS/EIR evaluation level under Build Alternative Option 1, 2, or 3.	Not applicable	Not applicable
Eastern Section – No Impact. Operational activities would consist of ongoing maintenance of existing infrastructure and would not require the alteration of existing drainage patterns or the addition of new impervious surfaces once construction is complete. Therefore, no impacts associated with soil erosion or loss of topsoil are anticipated at the Tier 1/Program EIS/EIR evaluation level under Build Alternative Option 1, 2, or 3.	Not applicable	Not applicable
Would the Program be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the Program and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction, or collapse?		
Construction		
Western Section – No Impact. No construction impacts are anticipated at the Tier 1/Program EIS/EIR evaluation level under Build Alternative Option 1, 2, or 3 because no physical improvements are proposed or required within the Western Section.	Not applicable	Not applicable

Impact Summary	Mitigation Strategy	Significance with Mitigation Strategy
Eastern Section – Potentially Significant. Potential impacts are dependent on the location of rail infrastructure improvements or station facilities, which are currently unknown. These facilities and infrastructure could be located within an area containing unstable soil characteristics that could result in seismic hazards. These seismic hazard areas would be considered during Project design with proposed infrastructure and structures required to adhere to all California Building Code requirements to address seismic safety. However, until a site-specific Project is identified, it is unknown if impacts would be significant. The Tier 2/Project-level analysis would identify and mitigate site-specific impacts associated with seismic-related ground failure.	GEO-1	**Less than Significant.** GEO-1 would minimize, reduce, or avoid potential impacts related to unstable soil through design and further analysis during the Tier 2/Project-level environmental process.
Operation		
Western Section – No Impact. The increase in train service (two additional round-trip daily trains within the Program Corridor) would not change existing land use and would not result in impacts associated with unstable soils. Therefore, no impacts are anticipated at the Tier 1/Program EIS/EIR evaluation level under Build Alternative Option 1, 2, or 3.	Not applicable	Not applicable
Eastern Section – No Impact. Once construction ceases, operation of the new railroad infrastructure and stations under the Build Alternative Options are not anticipated to result in changes associated with unstable soil conditions. Therefore, no impacts are anticipated at the Tier 1/Program EIS/EIR evaluation level under Build Alternative Option 1, 2, or 3.	Not applicable	Not applicable

Impact Summary	Mitigation Strategy	Significance with Mitigation Strategy
Would the Program be located on expansive soil, as defined in Table 18-1-B of the UBC (1994), creating substantial direct or indirect risk to life or property?		
Construction		
Western Section – No Impact. No construction impacts are anticipated at the Tier 1/Program EIS/EIR evaluation level under Build Alternative Option 1, 2, or 3 because no physical improvements are proposed or required within the Western Section.	Not applicable	Not applicable
Eastern Section – Potentially Significant. Potential impacts under Build Alternative Option 1, 2, or 3 related to expansive soil are dependent on the location of rail infrastructure improvements and station facilities, which are currently unknown. The Tier 2/Project-level analysis would identify and mitigate impacts associated with expansive soils.	GEO-1	**Less than Significant.** GEO-1 would minimize, reduce, or avoid potential impacts related to expansive soil through design and further analysis during the Tier 2/Project-level environmental process.
Operation		
Western Section – No Impact. The increase in train service (two additional round-trip daily trains within the Program Corridor) would not change existing land use and would not result in expansive soil hazards. Therefore, no impacts are anticipated at the Tier 1/Program EIS/EIR evaluation level under Build Alternative Option 1, 2, or 3.	Not applicable	Not applicable
Eastern Section – No Impact. Once construction ceases, operation of the new railroad infrastructure and stations under the Build Alternative Options are not anticipated to result in changes associated with expansive soils. Therefore, no impacts are anticipated at the Tier 1/Program EIS/EIR evaluation level under Build Alternative Option 1, 2, or 3.	Not applicable	Not applicable

Impact Summary	Mitigation Strategy	Significance with Mitigation Strategy
Would the Program have soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems where sewers are not available for the disposal of wastewater?		
Construction		
Western Section – No Impact. No construction impacts are anticipated at the Tier 1/Program EIS/EIR evaluation level under Build Alternative Option 1, 2, or 3 because no physical improvements are proposed or required within the Western Section.	Not applicable	Not applicable
Eastern Section – No Impact. During construction activities, the contractor would provide portable toilets on site, which would then be removed from the site on a regular basis for off-site servicing at an approved wastewater handling facility. Therefore, the use of alternative wastewater disposal systems are not anticipated during construction. No construction impacts associated with alternative wastewater disposal systems are anticipated under Build Alternative Option 1, 2, or 3 at the Tier 1/Program EIS/EIR evaluation level.	Not applicable	Not applicable
Operation		
Western Section – No Impact. The increase in train service (two additional round-trip daily trains within the Program Corridor) would not change existing land use that would result in the need for alternative wastewater disposal systems. Therefore, no impacts are anticipated at the Tier 1/Program EIS/EIR evaluation level under Build Alternative Option 1, 2, or 3.	Not applicable	Not applicable

Impact Summary	Mitigation Strategy	Significance with Mitigation Strategy
Eastern Section – No Impact. Operation of the Program under Build Alternative Option 1, 2, or 3 would require continual maintenance rail infrastructure and station facilities. The operation of maintenance and station facilities would generate wastewater; however, it is anticipated that these facilities would be connected to the local wastewater facility system and not to septic tanks or alternative wastewater disposal systems. Therefore, no impacts are anticipated at the Tier 1/Program EIS/EIR evaluation level under Build Alternative Option 1, 2, or 3.	Not applicable	Not applicable
Would the Program directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?		
Construction		
Western Section – No Impact. Destruction of a unique paleontological resource or geologic feature would not occur because no physical improvements are proposed or required within the Western Section. Therefore, no impacts are anticipated at the Tier 1/Program EIS/EIR evaluation level under Build Alternative Option 1, 2, or 3.	Not applicable	Not applicable
Eastern Section – Potentially Significant. Potential impacts on paleontological resources depend on the location of rail infrastructure improvements, station facilities, and the types of construction activities, which are currently unknown. The Eastern Section contains multiple areas of high paleontological sensitivity with the potential for subsurface resources to exist. Therefore, potentially significant impacts under Build Alternative Option 1, 2, or 3 are anticipated at the Tier 1/Program EIS/EIR evaluation level.	PAL-1 LU-3	**Potentially Significant.** PAL-1 and LU-3 would minimize, reduce, or avoid potential impacts on paleontological resources through design, further analysis, and the avoidance of resources. However, it is unknown to what extent and type of impact on paleontological resources would occur. Impacts may remain significant and unavoidable if further analysis determines that a non-renewable paleontological resource would be impacted by the rail infrastructure improvement or station facility proposed.

Impact Summary	Mitigation Strategy	Significance with Mitigation Strategy
Operation		
Western Section – No Impact. The increase in train service (two additional round-trip daily trains within the Program Corridor) would not change existing land use and would not result in the destruction of a unique paleontological resource or site or unique geologic feature within the Western Section of the Program Corridor. Therefore, no impacts are anticipated at the Tier 1/Program EIS/EIR evaluation level under Build Alternative Option 1, 2, or 3.	Not applicable	Not applicable
Eastern Section – No Impact. Once construction is complete, operation of Build Alternative Option 1, 2, or 3 would not result impacts on paleontological resources within the Eastern Section of the Program Corridor. Therefore, no impacts are anticipated at the Tier 1/Program EIS/EIR evaluation level under Build Alternative Option 1, 2, or 3.	Not applicable	Not applicable
Would the Program result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state?		
Construction		
Western Section – No Impact. No loss of availability of a known mineral resource would occur because no physical improvements are proposed or required within the Western Section. Therefore, no impacts are anticipated at the Tier 1/Program EIS/EIR evaluation level under Build Alternative Option 1, 2, or 3.	Not applicable	Not applicable

Impact Summary	Mitigation Strategy	Significance with Mitigation Strategy
Eastern Section – Potentially Significant. Potential impacts on mineral resources and associated plans and policies under Build Alternative Option 1, 2, or 3 are dependent on the location of rail infrastructure improvements and station facilities, which are currently unknown. The Tier 2/Project-level analysis would identify and analyze impacts associated with the loss of availability of a known mineral resource.	LU-3	**Potentially Significant.** LU-3 would minimize, reduce, or avoid potential impacts from conflicts with plans and policies through design and further analysis. However, impacts may remain significant and unavoidable, as further analysis may determine that there is a conflict that cannot be mitigated between land uses.
Operation		
Western Section – No Impact. The increase in train service (two additional round-trip daily trains within the Program Corridor) would not change existing land use and would not result in the loss of availability of a known mineral resource within the Western Section of the Program Corridor. Therefore, no impacts are anticipated at the Tier 1/Program EIS/EIR evaluation level under Build Alternative Option 1, 2, or 3.	Not applicable	Not applicable
Eastern Section – No Impact. Once construction is complete, operation of Build Alternative Option 1, 2, or 3 would not result in the loss of availability of a known mineral resource within the Eastern Section of the Program Corridor. Therefore, no impacts are anticipated at the Tier 1/Program EIS/EIR evaluation level under Build Alternative Option 1, 2, or 3.	Not applicable	Not applicable

Impact Summary	Mitigation Strategy	Significance with Mitigation Strategy
Would the Program result in the loss of availability of a locally important mineral resource recovery site delineated on a local general plan, specific plan, or other land use plan?		
Construction		
Western Section – No Impact. No loss of availability of a known mineral resource would occur because no physical improvements are proposed or required within the Western Section. Therefore, no impacts are anticipated at the Tier 1/Program EIS/EIR evaluation level under Build Alternative Option 1, 2, or 3.	Not applicable	Not applicable
Eastern Section – Potentially Significant. Potential impacts on mineral resources and associated plans and policies under Build Alternative Option 1, 2, or 3 are dependent on the location of rail infrastructure improvements and station facilities, which are currently unknown. The Tier 2/Project-level analysis would identify and analyze impacts associated with the loss of availability of a locally important mineral resource recovery site.	LU-3	**Potentially Significant.** LU-3 would minimize, reduce, or avoid potential impacts from conflicts with plans and policies through design and further analysis. However, impacts may remain significant and unavoidable, as further analysis may determine that there is a conflict that cannot be mitigated between land uses.
Operation		
Western Section – No Impact. The increase in train service (two additional round-trip daily trains within the Program Corridor) would not change existing land use and would not result in conflicts with locally important mineral resource recovery sites within the Western Section of the Program Corridor. Therefore, no impacts under Build Alternative Option 1, 2, or 3 are anticipated at the Tier 1/Program EIS/EIR evaluation level.	Not applicable	Not applicable

Impact Summary	Mitigation Strategy	Significance with Mitigation Strategy
Eastern Section – No Impact. Once construction is complete, operation of Build Alternative Option 1, 2, or 3 would not conflict with locally important mineral resource recovery sites within the Eastern Section of the Program Corridor. Therefore, no impacts under Build Alternative Option 1, 2, or 3 are anticipated at the Tier 1/Program EIS/EIR evaluation level.	Not applicable	Not applicable

Notes:

AP=Alquist-Priolo; BMP=best management practice; EIR=environmental impact report; EIS=environmental impact statement; UBC=Uniform Building Code

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3.10.8 Avoidance, Minimization, and Mitigation Strategies

Identified below are proposed programmatic mitigation strategies for further consideration in the Tier 2/Project-level analysis. Specific mitigation measures, to the extent required, would be identified and discussed during the Tier 2/Project-level analysis after design details are known and specific impacts are identified. Potential mitigation measures would be developed in consultation with the agency with jurisdiction over the resource.

Examples of programmatic mitigation strategies for geology, soils, seismicity, and mineral resources would include preparation of a preliminary geotechnical report to identify existing conditions, design considerations for alternative construction methods, and slope/soil stabilization measures where moderate to high effects are expected. Examples of programmatic mitigation strategies for paleontological resources would depend on the presence of significant paleontological resources and rock units with a high or undermined potential for containing significant fossils. Proposed programmatic mitigation strategies, consistent with state and federal regulations, include, but are not limited to, the following:

Mitigation Strategy GEO-1: During the Tier 2/Project-level analysis, a preliminary geotechnical report shall be prepared by a licensed geotechnical or civil engineer for the specific rail infrastructure or station facility proposed. The preliminary geotechnical report shall include, but not be limited to, analysis and recommendations on the following topics:

- Site preparation
- Soil-bearing capacity
- Appropriate sources and types of fill
- Liquefaction
- Lateral spreading
- Corrosive soils
- Structural foundations
- Grading practices

The recommendations identified in the preliminary geotechnical report shall be refined in a final geotechnical report.

Mitigation Strategy PAL-1: During the Tier 2/Project-level analysis, the lead agency or agencies shall determine if a paleontological resources assessment report is required for the specific rail infrastructure or station facility proposed. If required, a paleontological resources assessment report shall be prepared for the specific rail infrastructure or station facility proposed. The report shall include, but not be limited to, analysis and recommendations on the following topics:

- Geologic context of the region and site and the potential to contain paleontological resources
- A records search of institutions holding paleontological collections from the Southern California region
- A review of published and unpublished literature for past paleontological finds in the area

If the paleontological resources assessment report identifies that paleontological resources are present at the site or if the geologic units to be encountered by the Project are designated as having a high paleontological sensitivity by the applicable local jurisdiction and lead agency, a paleontological resources impact mitigation program shall be prepared and implemented by a professional paleontologist as defined under Secretary of the Department of the Interior Standards. The paleontological resource impact mitigation program shall include, but not be limited to, the following:

- The qualifications of the principal investigator and monitoring personnel
- Construction crew awareness training content, procedures, and requirements
- Measures to prevent potential looting, vandalism, or erosion impacts
- Location, frequency, and schedule for on-site monitoring activities
- Criteria for identifying and evaluating potential fossil specimens or localities
- A plan for the use of protective barriers and signs or implementation of other physical or administrative protection measures
- Collection and salvage procedures
- Identification of an institution or museum willing and able to accept any fossils discovered
- Compliance monitoring and reporting procedures

Mitigation Strategy HWQ-2: Based on the results of the Tier 2/Project-level analysis and recommendations, the construction of specific rail infrastructure or station facility proposed shall comply with the provisions of the National Pollutant Discharge Elimination System General Permit for Stormwater Discharges Associated with Construction and Land Disturbance Activities (Order Number 2009-0009-DWQ, National Pollutant Discharge Elimination System Number CAS000002), and any subsequent amendments (Order Number 2010-0014-DWQ and Order Number 2012-0006-DWQ). These provisions shall include, but are not limited to, the following:

- Construction activities shall not commence until a waste discharger identification number is received from the State Water Resources Control Board Stormwater Multiple Application and Report Tracking System.
- Identification of good housekeeping, erosion control, and sediment control best management practices shall be utilized during construction activities.
- A stormwater pollution prevention plan shall be prepared.
- A rain event action plan shall be prepared.
- A notice of termination shall be submitted to the State Water Resources Control Board within 90 days of completion of construction and stabilization of the site.

These requirements, and any additional approvals, shall be determined in coordination with the governing agencies or local jurisdiction before construction on a project commences.

Mitigation Strategy LU-3: During a subsequent Tier 2/Project-level analysis, a land use consistency analysis shall be conducted by the identified lead agency or agencies to determine consistency of the Tier 2/Project-level improvement being proposed with the applicable local jurisdictional general plans or programs. If the land use consistency analysis identifies sensitive land uses or environmental resources within the Tier 2/Project-level Study Area, design or siting strategies shall be identified by the lead agency or agencies to avoid or minimize conflicts with sensitive land uses or environmental resources.

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