BNSF/UPRR Mojave Subdivision
Tehachapi Rail Improvement Project

KERN COUNTY, CALIFORNIA

CALTRANS DISTRICT 6 – KERN – MOJAVE SUBDIVISION (MP 327.85-353.08)

SCH#xxxxxxxxx

DRAFT
Mitigated Negative Declaration

Prepared for:

State of California Department of Transportation

BNSF Railway Company and Union Pacific Railroad

July 2010

URS

General Information About This Document

What's in this document?

The California Department of Transportation (Caltrans) has prepared this Initial Study with Proposed Mitigated Negative Declaration, which examines the potential environmental impacts of alternatives being considered for the proposed project in Kern County, California. The document describes why the project is being proposed, alternatives for the project, the existing environment that could be affected by the project, and potential impacts from each of the alternatives, and the proposed avoidance, minimization, and/or mitigation measures.

What should you do?

- Please read this Initial Study. Additional copies of this document as well as the technical studies are available for review at the Caltrans District 6 office at 2015 E. Shields Avenue, Suite 100, Fresno, CA 93726 and Kern County Library-Tehachapi Branch at 1001 West Tehachapi Boulevard, Suite A-400, Tehachapi, CA 93561.
- We welcome your comments. If you have any concerns regarding the proposed project, please send your written comments to Caltrans by the deadline. Submit comments via U.S. mail to Caltrans at the following address:

  Kirsten Helton, Chief
  Central Region Environmental Division
  California Department of Transportation
  2015 E. Shields Avenue, Suite 100
  Fresno, CA 93726

  Submit comments via email to: kirsten_helton@dot.ca.gov.
- Submit comments by the deadline: Aug 30, 2010.

What happens next?

After comments are received from the public and reviewing agencies, Caltrans may 1) give environmental approval to the proposed project, 2) do additional environmental studies, or 3) abandon the project. If the project is given environmental approval and funding is appropriated, Caltrans, in cooperation with BNSF Railway Company, could finalize design and construct all or part of the project.

For individuals with sensory disabilities, this document is available in Braille, in large print, on audiocassette, or on computer disk. To obtain a copy in one of these alternate formats, please call or write to Caltrans, Attn: Kirsten Helton, Environmental Division, 2015 E. Shields Avenue, Suite 100, Fresno, CA 93726; (559) 243-8243 Voice, or use the California Relay Service TTY number (559) 488-4066 or 711.

DISTRICT 6 – KERN – UNION PACIFIC RAILROAD/MOJAVE SUBDIVISION (mile posts 327.85-353.08)

BNSF/UPRR Mojave Subdivision Tehachapi Rail Improvement Project

Construct an additional track along five rail
segments within the Tehachapi Pass area

INITIAL STUDY
WITH PROPOSED MITIGATED NEGATIVE DECLARATION

Submitted Pursuant to: (State) Division 13, California Public Resources Code (Sec. No. 21000 et al)

THE STATE OF CALIFORNIA
Department of Transportation

7-15-10
Date of Approval

Sarah Gassner
Acting Office Chief, North
California Department of Transportation

Proposed Mitigated Negative Declaration

Pursuant to: Division 13, Public Resources Code

Project Description

The California Department of Transportation (Caltrans) proposes to partially fund, with State Transportation Corridor Improvement Funds, the Tehachapi Rail Improvement Project, which would construct an additional track and other necessary infrastructure improvements along five rail segments within the Tehachapi Pass area in Kern County.

Determination

This proposed Mitigated Negative Declaration has been prepared to give notice to interested agencies and the public that it is Caltrans' intent to adopt a Mitigated Negative Declaration for this project. This does not mean that the Caltrans decision regarding the project is final. This Mitigated Negative Declaration is subject to change based on comments received by interested agencies and the public.

Draft

Caltrans has prepared an Initial Study for this project and, pending public review, expects to determine from this study that the proposed project would not have a significant effect on the environment for the following reasons:

- The proposed project would have a less than significant impact on: land use and planning, farmlands, public and emergency services, and visual resources.
- The proposed project would have no significant adverse effect on: traffic and transportation/pedestrian and bicycle facilities, cultural resources, hydrology, water quality, paleontological resources, geology, hazards and hazardous materials, air quality, noise, biological resources, and climate change, because the following mitigation, minimization, and/or avoidance measures would reduce or avoid impacts to less than significant.
    - Transportation and traffic impacts would be minimized by compliance with all Caltrans and California Public Utilities Commission permit provisions.
    - Cultural resource impacts would be mitigated by the preparation and implementation of a Cultural Resource Monitoring Plan, and compliance with extended monitoring requirements.
    - Hydrology and water quality impacts would be minimized by project design features in compliance with the State Water Quality Control Board National Pollutant Discharge Elimination System General Construction Permit provisions.
    - Geology, soils, and mineral resource impacts would be minimized by project design features, BNSF Railway operational and maintenance procedures, preparation and implementation of dust control and re-vegetation plans, and compliance with all required permit provisions.
    - Paleontological resource impacts would be mitigated by preparation and implementation of a Paleontological Mitigation Plan, and compliance with all requirements identified in the document.
    - Hazards and hazardous materials impacts would be minimized by BNSF Railway operational and maintenance procedures and preparation and implementation of Fire Suppression Management and Construction Emergency Response Plans.
    - Air quality impacts would be minimized by BNSF Railway operational and maintenance procedures and compliance with all San Joaquin Valley Air Pollution Control District regulations and permit provisions.

- Noise impacts would be minimized by BNSF Railway operational and maintenance procedures.
- Biological resource impacts would be minimized by preparation and implementation of a Native Vegetation Restoration and Monitoring plan, and compliance with all required permit provisions. No impacts to wetlands will occur as a result of the project as water features located within the project area are not considered Waters of the United States.

Summary

Introduction

This Mitigated Negative Declaration proposed for the Tehachapi Rail Improvement Project, funded by the California Transportation Commission, describes the potential impacts and mitigation related to construction of an additional track along five rail segments within the Tehachapi Pass area. New and temporary bridge structures and the extension of existing culverts are also improvements proposed as part of the project.

The project consists of five segments north of State Route 58 and State Route 223, running through the towns of Caliente and Keene. Traveling from west to east, the project would add a second rail segment parallel to existing track ("double track") at the following segment locations:

- 2.69 miles from Bena to Ilmon (mile posts 327.85-330.54)
- 2.75 miles from Caliente to Bealville (mile posts 335.29-338.04)
- 0.34 mile through the Cliff Siding Extension (mile posts 343.30-343.64)
- 1.55 miles from Rowen to Woodford (mile posts 346.40-348.15)
- 1.01 miles from Walong to Marcel (mile posts 352.07-353.08)

Purpose and Need

Rail service through the Tehachapi Pass is experiencing worsening congestion, a growing volume of rail traffic and increased delays. Rail volumes through the Tehachapi Pass have greatly increased in the past decade due to growth in volume of goods transported through the region to destinations in the Midwest and South. In addition to rail transportation, the only significant means of access across the Tehachapi Mountains between the Central Valley and eastern points such as Las Vegas and Phoenix is through State Route 58, a four-lane expressway with traffic controls in many segments. About 30% of the traffic on this portion of this expressway stems from trucks. Rapid growth in Bakersfield in recent years has also added traffic and congestion. This trend is expected to continue in the future.

The project would do the following:

- Reduce operational constraints that limit efficiencies of rail freight movement across the Tehachapi Mountains.

- Improve operational capacity above the current level of sustainable capacity to increase efficiencies along the project corridor.
- Enhance the rail transportation mode to allow greater volumes of freight to be shipped by rail as a way to relieve congestion and delay experienced along State Route 58.

The existing rail line is expected to reach capacity by 2011. It is anticipated that remaining operational capacity, defined as the available train slots, will soon reach zero. The existing rail line has the following constraints:

- Insufficient capacity placing a disproportionate reliance on freight movement by carriers other than train.
- Operational challenges associated with extreme track curvature and single-line trackage.
- Declining operational capacity for additional trains.
- Fuel and lost time costs associated with train delays at current capacity.
- Lack of alternative north/south rail corridors.

Proposed Action – Project Funding

The Tehachapi Rail Improvement Project is anticipated to receive 50% of funding from the California Transportation Commission for freight transport improvement along the Tehachapi Trade Corridor. The project is one of five critical freight movement projects identified by the State of California. Primary funding for the project comes from the Transportation Corridor Improvement Funds, a portion of Proposition 1B-designated funds. Prop 1B money authorizes the State to fund transportation projects with bonds to relieve congestion, improve the movement of goods, improve air quality, and enhance the safety and security of the transportation system with project components that add to the efficiency and capacity of the freight rail system. The project is eligible for funding because it would improve the movement of goods through the Tehachapi Pass by relieving congestion, enhancing the safety and security of the transportation system, and improving the efficiency and capacity of the rail freight system.

The California Transportation Commission is anticipated to approve the designated Transportation Corridor Improvement Funds. This, therefore, is the discretionary action triggering the application of the California Environmental Quality Act. The BNSF (Burlington Northern Santa Fe) Railway is partnering with the State of California on this rail project and would be providing matching funds. It is anticipated that BNSF Railway

would provide for 50% of the funding for the rail improvement project. The estimated project cost is $106.7 million (2012 dollars). In addition to the 50% private match, the future maintenance of the new rail infrastructure would be privately funded by the railroads.

Project Impacts

The results of this Mitigated Negative Declaration for the Tehachapi Rail Improvement Project are summarized below in Table S-1 and conclude that the project would result in potential impacts to the following environmental categories (as further discussed in Chapter 2, impacts would be considered less than significant with the incorporation of identified mitigation and/or minimization and avoidance measures):

Table S-1: Summary of Potential Environmental Impacts from Alternatives

	Build Alternative	No-Build Alternative
Human Environment		
Land Use	Compatible with current Land Use.	Compatible with current Land Use.
Farmlands	Permanent Take of 19.6 Acres of Farmland. Temporary Take of 7.2 Acres of Farmland.	No impact to farmland would occur. Farmland would stay as grazing land.
Community Impacts	No impact to the community is anticipated.	No change would occur to the communities, population, or housing. Conditions would remain the same.
Public and Emergency Services	Potential minor temporary impacts to emergency access.	No impact anticipated. Train operations would continue as they do now; no additional public or emergency services would be required.
Traffic and Transportation	Minimization and avoidance measures required on impacts to local roadways and bridges and alternative routes or detours at existing railroad crossings. Reduction in traffic may occur on other roads due to increased freight capacity on the Tehachapi Line.	No change to anticipated traffic patterns on state and local roadways. Rail traffic on the Tehachapi line would reach capacity.
Visual and Aesthetics	Minor impacts to scenic resources. Most locations are remote from viewers.	No impact anticipated. Train operations would continue as they do now; no new visual or aesthetic impacts would occur.
Cultural Resources	There are no anticipated impacts to site due to avoidance measures.	No new area would be disturbed; therefore, no impacts to areas containing potential cultural resources would occur.
Physical Environment		
Hydrology and Floodplain	There would be negligible change in pre- and post-construction storm flows.	No impacts to hydrology or floodplain. Conditions would remain the same.
Water Quality	Minimal Impacts with implementation of Best Management Practices.	No impact anticipated. No new area would be disturbed; existing conditions would remain unchanged. No impacts to water quality would occur.
Geology/Soils/ Seismic/Topography	Minimal impacts with implementation of minimization measures.	No impacts to geology, soil, or topography are anticipated. All seismic issues would remain

	Build Alternative	No-Build Alternative
		unchanged.
Paleontology	There are no known resources impacts. Monitoring measures would be included to protect unknown resources.	No impact anticipated. The train would continue to run in an existing, pre-disturbed rail corridor. No additional adverse impacts are anticipated.
Hazardous Waste or Materials	Compliance with OSHA requirements and elements of the blasting plan would minimize impacts during construction.	No impact anticipated. Current train operations would continue, and no exposure to new hazardous waste or materials sources would occur.
Air Quality	The project would create the following changes in total pollutant releases (tons per year): Volatile Organic Compound -4.76, Nitrous Oxide -42.17, Carbon Dioxide 8.35, and Particulate Matter under 10 microns: -2.21.	Air quality conditions would remain the same.
Noise and Vibration	Receptors would see a 0.3- to 1.2-dBA increase in ambient level noise.	Noise conditions would remain the same.
Biological Resources/Environment		
Natural Communities	Implementation of a Native Vegetation Restoration and Monitoring Plan consistent with re-vegetation strategies as described under the Visual Resources Impact Analysis is required.	No impact anticipated. Train operations would remain as they are now, and no impacts to natural communities would occur.
Wetlands	The project would permanently affect 1.5 acres of non-jurisdictional wetland. The project's temporary impact would be 0.8 acre of non-jurisdictional wetland.	No impact anticipated. Train operations would remain as they are now, and no impacts to wetland areas would occur.
Plant Species	Applicable local tree, shrub, plant, and protection requirements to be met before undertaking ground-disturbing activities in the biological study area that may adversely affect oak woodlands, large individual oaks, or any other native tree species.	No impact anticipated. Train operations would remain as they are now, and no impacts to plant species would occur.

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List of Abbreviated Terms

BNSF	Burlington Northern Santa Fe
Caltrans	California Department of Transportation
CEQA	California Environmental Quality Act
dBA	Decibels
LOS	Level of Service
MPH	Miles Per Hour
UPRR	Union Pacific Railroad

Chapter 1 Proposed Project

1.1 Introduction

The Tehachapi Rail Improvement Project would improve, extend, and construct an additional track (provide double-tracking) along five “bottlenecked” rail segments in the Tehachapi Pass between Bakersfield and Mojave, California. The project would build new permanent and temporary bridges and extend existing culverts. Figure 1.1-1, Regional Project Vicinity Map, shows the project location and surrounding area.

The Bakersfield-to-Mojave route is mostly double-tracked, except for nine single-track segments paralleling State Route 58 through the Tehachapi Pass. This project would double-track five of the nine single-track segments as shown in Figures 1.1-1 and 1.1-2. From west to east, the five segments proposed for double-tracking are as follow:

- Bena-to-Ilmon
- Caliente-to-Bealville
- Cliff Siding Extension
- Rowen-to-Woodford
- Walong-to-Marcel

The five segments total 8.21 miles. The total distance, including project segments, is 25.23 miles through the Tehachapi Pass.

1.1.1 Purpose

The State of California has identified the project as a critical rail project. The project area is experiencing increased congestion, rail traffic volume, and delays. Rail volumes through the Tehachapi Pass have greatly increased in the past decade due to growth in volume of goods transported through the region. In addition to rail transportation, State Route 58 provides the other significant means of access across the Tehachapi Mountains between Central California and states to the east, such as Nevada and Arizona. About 30% of the traffic on this portion of State Route 58 stems from trucks. Rapid growth in Bakersfield in recent years has also added traffic along major routes going through the Bakersfield Metropolitan Region to the Mojave area. This growth is anticipated to increase; therefore, the project’s goal is to add capacity, provide reliable and efficient

freight transportation, and improve overall movement of goods through the Tehachapi Pass. The project would do the following:

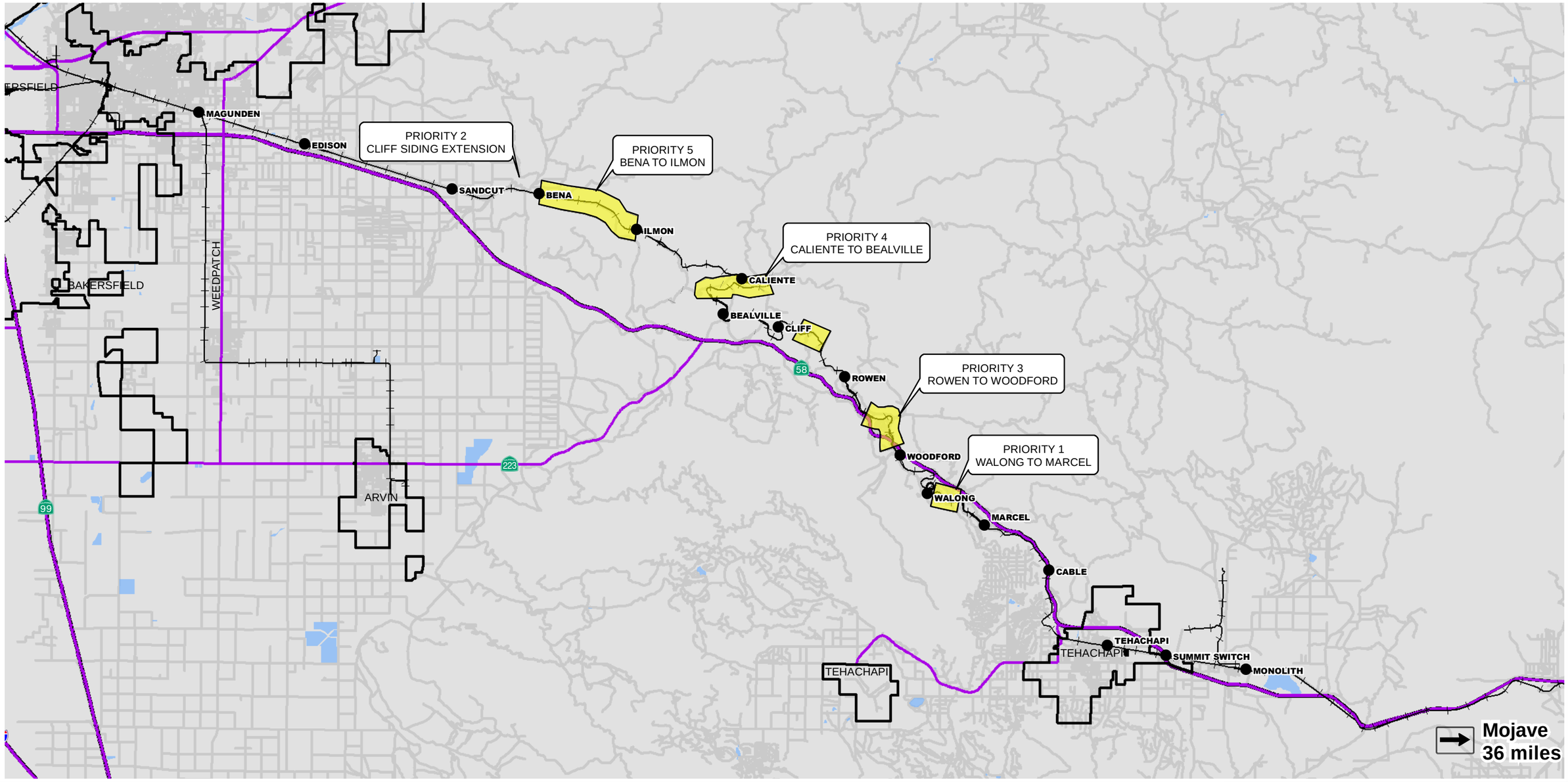
- Reduce operational constraints that limit efficiencies of rail freight movement across the Tehachapi Mountains.

1.1.2 Need

The need of the project is to address the problem that current track capacity, causing increasing congestion and delay, would have on future freight movement along the Tehachapi Pass.

The Tehachapi Pass rail corridor is experiencing increased volume, congestion, and delays. Rail volumes through the Tehachapi Pass have greatly increased in the past decade due to growth in volume of goods transported through the region. The existing rail line is approaching capacity and is expected to reach capacity by 2011. It is anticipated that remaining operational capacity, defined as the available train slots, will soon reach zero.

The present capacity of the existing main track configuration through the Tehachapi Pass is 50 trains per day, the equivalent of 48 6,000-foot trains and two 7,000-foot trains per day. Fifty trains per day is equivalent to about 9,438 containers. Currently, very limited capacity exists to accommodate maintenance or recovery from incidents, such as mechanical failure, without the benefit of an additional second track throughout the Tehachapi Pass rail corridor. Additional growth in operation along this rail corridor is expected to compound the existing conditions and cause additional operational inefficiencies, leading to significant slowdown in train movements due to physical capacity constraints and a reduction in available time for track maintenance.



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PROJECT SEGMENTS

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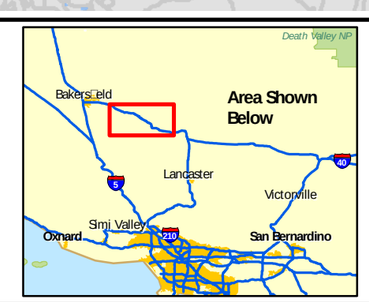
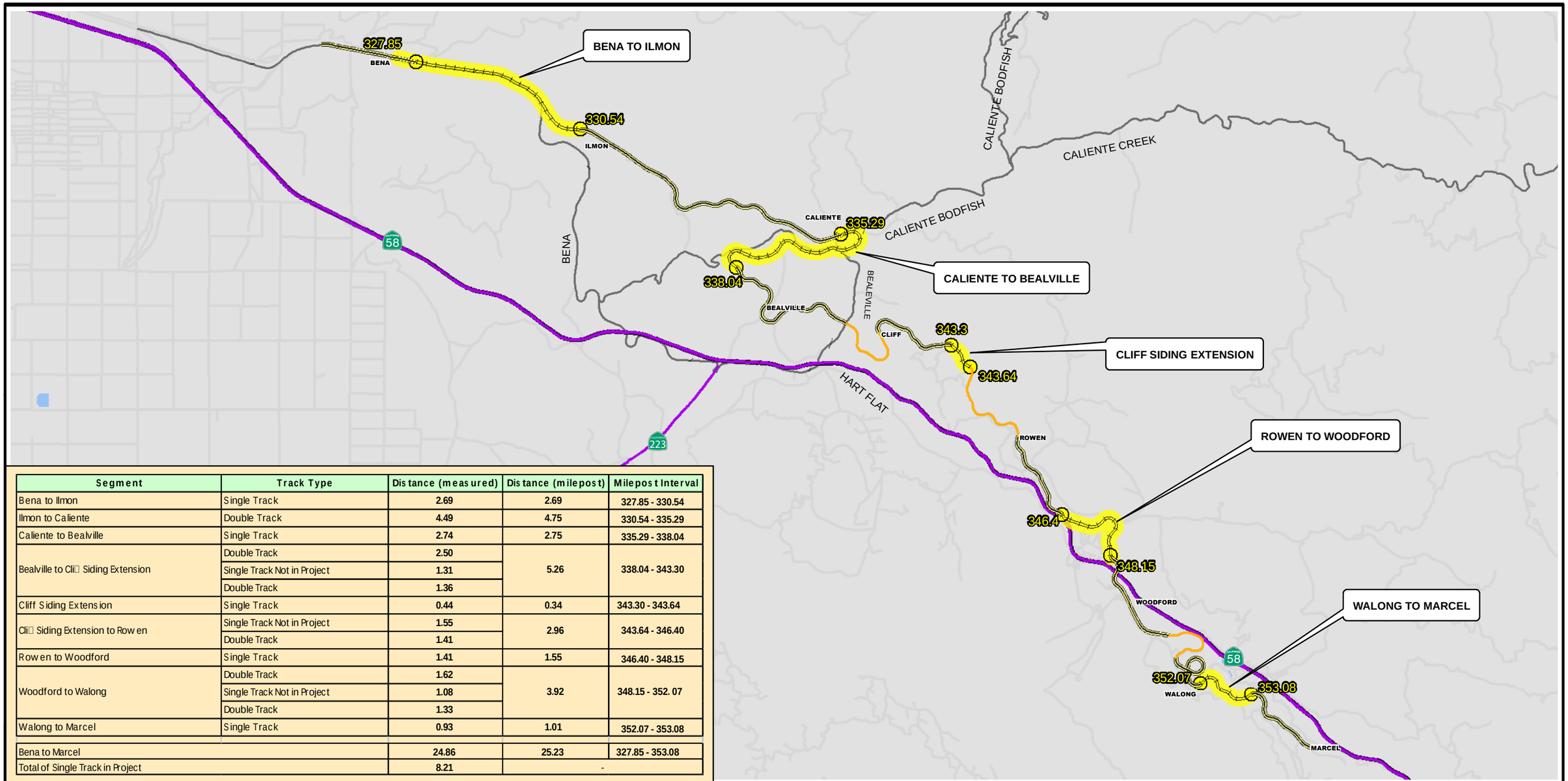


BNSF/UPRR Mojave Subdivision Tehachapi Rail Improvement Project

Regional Project Vicinity Map

July 2010	Figure 1.1-1

Sources: Kern County GIS Department/ JL Patterson & Associates



Segment	Track Type	Distance (measured)	Distance (milepost)	Milepost Interval
Bena to Ilmon	Single Track	2.69	2.69	327.85 - 330.54
Ilmon to Caliente	Double Track	4.49	4.75	330.54 - 335.29
Caliente to Bealville	Single Track	2.74	2.75	335.29 - 338.04
Bealville to Cli Siding Extension	Double Track	2.50	5.26	338.04 - 343.30
	Single Track Not in Project	1.31		
	Double Track	1.36		
Cliff Siding Extension	Single Track	0.44	0.34	343.30 - 343.64
Cli Siding Extension to Rowen	Single Track Not in Project	1.55	2.96	343.64 - 346.40
	Double Track	1.41		
Rowen to Woodford	Single Track	1.41	1.55	346.40 - 348.15
Woodford to Walong	Double Track	1.62	3.92	348.15 - 352. 07
	Single Track Not in Project	1.08		
	Double Track	1.33		
Walong to Marcel	Single Track	0.93	1.01	352.07 - 353.08
Bena to Marcel		24.86	25.23	327.85 - 353.08
Total of Single Track in Project		8.21	-	

BNSF TEHACHAPI

PROJECT SEGMENTS

Milepost

Single Track

Double Track

Single Track Not in Project

0 1 2 Miles

BNSF/UPRR Mojave Subdivision Tehachapi Rail Improvement Project

Project Segment / Milepost Map

July 2010	Figure 1.1-2

Sources: Kern County GIS Department/JL Patterson & Associates

1.2 Alternatives

Two alternatives are under consideration: the Build Alternative and the No-Build Alternative. The alternatives are evaluated based on their ability to meet the project's purpose and need and minimize the project's environmental effects. The alternatives' comparative merits are identified. Alternatives to the project were developed by an interdisciplinary team that included representatives from BNSF Railway, Union Pacific Railroad, Caltrans Division of Rail and District 6.

1.2.1 Build Alternative

The Build Alternative would double-track five segments within the project area (refer to Figure 1.1-1), build new bridges, and extend culverts. The locations were chosen with the idea of minimizing or avoiding impacts to watercourses, bridges, culverts, tunnels, and historical fills. The segments would be built in the following order:

Priority #1: Walong to Marcel (mile posts 352.07-353.08). The proposed double-track alignment is 1.01 miles long and would parallel the existing track-north, connecting the Walong siding with the Marcel siding. The new track, proposed to be built in a graded slot about 40-50 feet north of the existing track centerline, would bypass Tunnel #10. A total of 10 existing culverts and drainage conveyance approaches would be extended.

Priority #2: Cliff Siding Extension (mile posts 343.30-343.64). The Cliff Siding segment is the shortest segment to be double-tracked, totaling only 0.34 mile. The double-track extension of the existing siding would occur on track-south. The segment would require one private crossing. Tunnel #7 would not be a part of the project. No additional structures would be added or removed at this segment.

Priority #3: Rowen to Woodford (mile posts 346.40-348.15). This segment is 1.55 miles long and would be built parallel to the existing track. A bridge at mile post 346.83 would be built next to the existing bridge. A temporary bridge for construction access would be built over Tehachapi Creek directly adjacent to the bridge. All nine existing culverts within this segment would be extended.

Priority #4: Caliente to Bealville (mile posts 335.29-338.04). This segment is 2.75 miles long and would include a new track alignment parallel to the existing track. The existing grade crossing at Caliente Bodfish Road would be rebuilt to meet Public Utilities Commission standards. A new bridge would be built over Tehachapi Creek and Bealville Road at mile post 335.94. The new proposed track would include a crossover to the south

of the existing track-south. A shoofly, or temporary bypass, would be built at Tunnel #1 (mile post 336.95) and Tunnel #2 (mile post 337.81). No tunnels would be removed as a part of this project. A total of nine existing culverts would be extended within this segment. The new track would tie into the existing Bealville siding at mile post 338.04. A retaining wall would be built along a small portion of track to minimize construction impact to Caliente Bodfish Road. Construction access to the eastern portion of this segment would be through Caliente Creek.

Priority #5: Bena to Ilmon (mile posts 327.85-330.54). This segment is 2.69 miles long and would tie in with the existing double-track from Bakersfield to Bena at mile post 327.85. The proposed alignment would be built on track-north of the existing track and would follow Bena Road for the entire length before it would curve to the east before reaching Ilmon. Existing bridges at mile posts 328.21 and 330.04 would not be affected by construction; however, two new bridges would be built next to and parallel to the existing bridges. Existing culverts at mile posts 329.3 and 329.66 would not be changed or extended.

The project would build a new second main track next to and parallel to the existing single track at most locations. Most of the project would be built on existing cleared or disturbed areas and maintenance roads within the Union Pacific Railroad right-of-way. A new access road would be built next to the new track for maintenance access and to protect the track against rock fall and erosion. Existing maintenance roads would remain in locations where construction does not affect them; be re-established adjacent to the new track in impacted locations, where possible; or be eliminated where significant topography or environmental concerns limit the construction footprint.

All proposed and existing culverts would be reviewed during the project’s design phase to determine if change is needed to enable access following the recommended design agreed to by the multi-disciplinary team.

Proposed Project Scheduling

The project would be built according to the rail segment priority order. The order was determined by various engineering and topographical factors. The project would start construction in 2012 and be completed by 2020, according to the following order and schedule (Table 1.2-1).

Table 1.2-1 Segment Construction Order of Priority and Schedule

Segment	Priority of Construction	Start Date (year)	Completion Date (year)
Walong to Marcel	1	2012	2013
Cliff Siding	2	2014	2015
Rowen to Woodford	3	2015	2016
Caliente to Bealville	4	2017	2018
Bena to Ilmon	5	2019	2020

Source: BNSF 2009

Anticipated Project Capacity Increase

Following construction of the proposed project, operation through this segment of the Mojave Subdivision would be improved through an overall increase in train capacity. With the project, it is anticipated that an average of 50 trains per day would pass through the Tehachapi route, increasing by 10 trains per day from the current average of 40. The system capacity would increase from 50 trains per day to 65 with the project, or an equivalent of 9,438 containers per day to 11,609 containers per day. The length of trains that the tracks could support would increase from 6,000 feet to 8,000 feet.

Train capacity is expected to begin increasing in 2013, on completion of the first project segment. Complete construction of all five project segments is expected by 2020. Therefore, operational capacity of the system would incrementally increase as each rail segment is completed and continue to increase until the entire project has been built. As a result of the phased project implementation schedule, impacts are proposed to be examined at project completion (2020).

Anticipated Project Grading

The project would require cutting slopes, adding bridges, and extending existing culverts. Double-tracking the project segments would require grading with cut and fill earthwork. The amount of cuts and fills would vary depending on the steepness and constraints imposed by the topography. The proposed project design seeks to minimize the amount of cut and fill to reduce the need for additional right-of-way and biological and cultural impacts outside of the right-of-way.

Project Construction Details

BNSF Railway anticipates that construction of the project would be completed by 2020 (anticipated start date would be 2012). Up to three crews may work on the project, using various types of construction equipment, including excavators, dozers, compactors, water trucks, cranes, and graders. As referenced within Kern County Code, Title 8, construction operations would not occur between 9:00 p.m. and 6:00 a.m. Monday through Friday or

at any time between 9:00 p.m. and 8:00 a.m. during weekends and holidays. Construction would not occur at nighttime so that potential light and glare on residences, roads, and public use areas would be avoided.

Eleven staging areas have been identified. Staging areas would be used to temporarily stockpile construction fill material and would serve as laydown areas for construction vehicles and supplies. The staging areas would sit at previously disturbed areas and may extend beyond the existing Union Pacific Railroad right-of-way. These areas are shown on the Project Area Limits map in the Archaeological Survey Report in the Combined Technical Reports document of this Mitigated Negative Declaration.

1.2.2 No-Build Alternative

The No-Build Alternative would allow continuation of existing rail services as defined under the BNSF Railway and Union Pacific Railroad operation plan. Under the No-Build Alternative, no planned improvements would be made for the existing tracks. No new second main track through Tehachapi Pass would be built, and railroad operations in the region would continue as they are now.

The No-Build Alternative would not meet the project's purpose and need. Delays would increase for trains going through the Tehachapi Pass, causing an increasing number of trains to stop or be delayed for extended periods due to the time required for trains to navigate the single existing tracks. Failure to implement the project would delay rail operation, adversely affecting trains that use Union Pacific Railroad tracks, potentially making this form of freight transit less desirable.

Ultimately, as the delays become greater, transportation by truck would be the option selected to move goods through the Tehachapi Pass because it would be the shortest, most efficient option.

1.3 Permits and Approvals Needed

The following permits, reviews, and approvals would be required for project construction:

Table 1.3-1 Permits and Approvals Needed

Agency	Permit/Approval	Status
California Department of Fish and Game	1600 Permit	To be obtained before project grading
Regional Water Quality Control Board	Waste Discharge Report Permit 401 Permit	To be obtained before project grading
San Joaquin Valley Air Pollution Control District	Asbestos and Disposal Permit	To be obtained before project grading
Caltrans and County of Kern Public Works Department	Stormwater Pollution Prevention Plan	To be obtained before project grading
County of Kern Roads Department	Construction-related Road Closure Permit	To be obtained during project construction, five working days before need for road closure/detour
California Public Utilities Commission	Grade-crossing Permit (Geo-88)	To be obtained before project construction

Chapter 2 Affected Environment, Environmental Consequences, and Avoidance, Minimization, and/or Mitigation Measures

This chapter explains the impacts that the project would have on the human, physical, and biological environments in the project area. It describes the existing environment that the project could affect, potential impacts from each alternative, and proposed avoidance, minimization, and/or mitigation measures. Any indirect impacts are included in the general impacts analysis and discussions that follow. Technical studies have been prepared to support the general impact analyses and are listed in Chapter 7 of this document and provided in their entirety as appendices in separate documents.

As part of the scoping and environmental analysis done for the project, the following environmental issues were considered. It was determined that the project would result in no significant impacts to these environmental topics. Consequently, there is no further discussion of these issues in this document.

- Coastal Zone (Human Environment-Land Use) – The project is not located within a coastal zone (U.S. Geological Survey map, field visit May 2008).
- Wild and Scenic Rivers (Human Environment-Land Use) – There are no wild or scenic rivers within the project boundary (Preliminary Jurisdictional Report, URS 2009).
- Parks and Recreation (Human Environment-Land Use) – There are no public parks or recreational areas in the vicinity of the project or immediately adjacent to the project (Kern County General Plan).
- Growth (Human Environment) – Operation of the project would not indirectly or directly induce growth since it is anticipated that the freight train crews would reside near the dispatch or origin points of the freight train assembly, and not reside or relocate to the study area. The freight trains would not stop or disembark in the study area to load goods or to service trains. No long-term employment opportunities would result; therefore, project-induced growth would not occur in the study area.
- Utilities (Human Environment-Utilities/Emergency Services) – No impacts are anticipated with respect to existing utilities in the project area because the project

involves construction of additional railroad track at various segments along an existing railroad right-of-way. No additional utilities would be needed.

- Plants Species – There are no impacts to Special Status plant species. (Natural Environment Study, March 2010)
- Animal Species – There are no impacts to Special Status Animal Species (Natural Environment Study, March 2010)
- Threatened and Endangered Species – There are no impacts to threatened and endangered species. (Natural Environment Study)

2.1 Human Environment

2.1.1 Land Use and Planning

The Land Use and Planning section includes a discussion of existing conditions and land use impacts associated with the construction and operation of the proposed project.

Affected Environment

The Tehachapi Rail Improvement Project is located in an unincorporated area of Kern County, within the Tehachapi Mountain Ranges. The project passes through the communities of Keene, Caliente, and Bena. Land within 0.5 mile of the proposed project is privately owned—except for a minor portion of County-owned lands east of Bena, between Caliente to Bealville, and east of Cliff Siding—and subject to the Kern County General Plan, adopted Specific Plans, and zoning ordinances.

Kern County General Plan Land Use Element

As shown in Figure 2.1-1, General Plan and Specific Plan Land Use, existing General Plan land use designations within 0.5 mile of the project area include Exclusive Agriculture, Limited Agriculture, Estate (1 acre), Low-Density Residential, Heavy Industrial, and Neighborhood Commercial. These designations are defined in detail in the General Plan.

Land use within 0.5 mile of the Bena-to-Ilmon, the Caliente-to-Bealville, and the Cliff Siding segments is predominately designated as Extensive Agriculture on the General Plan. Land included in the Extensive Agriculture designation is intended to be used for agricultural uses involving large amounts of land with relatively low value-per-acre yields, such as livestock grazing, dry land farming, and woodlands. The minimum parcel size is 20 gross acres, except lands subject to a Williamson Act Contract or Farmland

Security Zone Contract (see Section 2.1.2, Farmlands/Timberlands), in which case the minimum parcel size is 80 gross acres.

Keene Rural Community Plan and the Keene Ranch Specific Plan

Portions of land within 0.5 mile of the Rowen-to-Woodford project segment are within the Keene Rural Community Plan and the Keene Ranch Specific Plan, which include Residential (various minimum acreage per unit requirements), General Commercial, Educational Facilities, Light Industrial, and Resource Reserve land use designations, as shown in Figure 2.1-1. Land within 0.5 mile of the Rowen-to-Woodford segment not covered within the Specific Plans is predominately designated as Extensive Agricultural in the General Plan. Land within 0.5 mile of the Walong to Marcel segment is designated as Resource Reserve, Residential (Min Gross 20AC/Unit), and Extensive Agricultural.

Land Use Zoning

Kern County zoning districts within 0.5 mile of the proposed project site are shown in Figure 2.1-2, Zoning. Land within this area is predominantly included in the Exclusive Agriculture (A) and the Limited Agriculture (A-1) zoning districts. The purpose of the Exclusive Agriculture (A) District is to designate areas suitable for agricultural uses and to prevent the encroachment of incompatible uses onto agricultural lands and the premature conversion of such lands to nonagricultural uses. The purpose of the Limited Agriculture (A-1) District is to designate areas suitable for a combination of estate-type residential development, agricultural uses, and other compatible uses. Other zoning districts within 0.5 mile of the identified rail segments of proposed project include:

- Heavy Industrial (M-3) District along the northern side of the railroad alignment and Floodplain (FP) Combining District in the Bena-to-Ilmon segment
- Low-Density Residential (R-1) and Mobile Home Combining District and Neighborhood Commercial (C-1) District in Caliente
- Residential (estate [one acre] to medium density), Commercial (neighborhood, general, and highway), Light Manufacturing, and Open Space west of the railroad alignment in Keene
- Estate 1 Acre (E[1]) and Residential Suburban (RS) Combining District south of the railroad alignment in the Walong-to-Marcel segment

Land within 0.5 mile of the proposed project is mostly used for grazing. Industrial zoning designations are found within the Bena-to-Ilmon segment. But, actual land uses within the vicinity of the railroad right-of-way are mainly low intensity grazing related.

Residences sit at various spots along the railroad alignment, particularly within the more developed communities of Caliente and Keene. Residences that sit across from Caliente Bodfish Road within the Caliente-to-Bealville segment are identified as sensitive receptors for noise and vibration (see discussion in Chapter 2.2.7, Noise and Vibration). Neighborhood and general commercial uses are also found in the communities of Caliente and Keene.

In addition, the National Chavez Center abuts the railroad right-of-way. The Chavez Center is a 187-acre site that contains a visitor center and memorial garden, plus the headquarters of the United Farm Workers and the National Farm Workers Service Center. Future expansion phases for the Chavez Center include a museum, a learning center and conference facilities, but no construction plans have been made at this time.

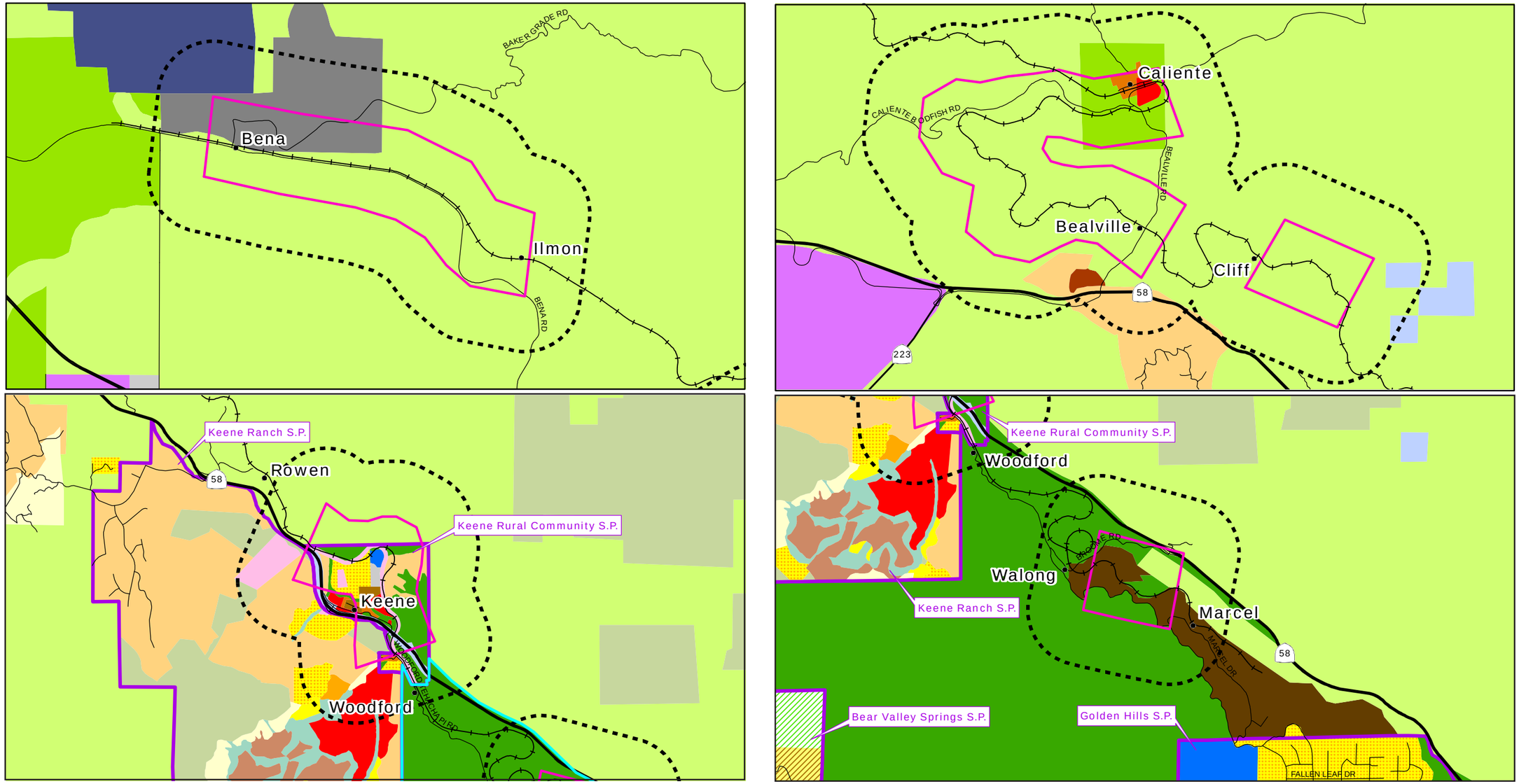
Kern County General Plan Circulation Element

Railroads and spur lines are identified in the Kern County General Plan Circulation Element. The Circulation Element also notes that at-grade road crossings of rail tracks present safety hazards, specifically in the San Joaquin Valley during foggy conditions when visibility is an issue. This issue is discussed further in Chapter 2.1.5, Traffic and Transportation/Pedestrian and Bicycle Facilities.

There are no bikeways, bicycle facilities, or pedestrian facilities in the project area. The project is not covered by the networks identified by the Kern Council of Governments Bicycle Facilities Plan, as adopted by and referenced in the Kern County General Plan.

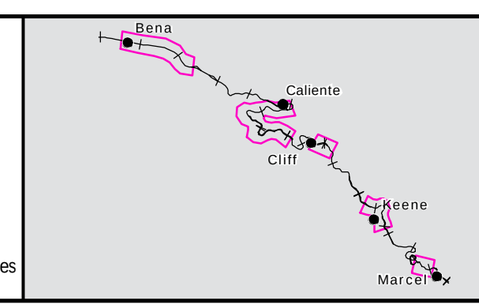
California Goods Movement Action Plan

The Goods Movement Action Plan addresses how the goods movement corridor discussed in this report serves to meet the goals of the California Transportation Commission and Transportation Corridor Improvement Funds by solving infrastructure needs and enhancing rail freight movement across the Tehachapi corridor. The project would contribute to fulfilling objectives from the Goods Movement Action Plan, which include generating jobs, increasing mobility and relieving traffic congestion, improving air quality, protecting public health, enhancing public safety, and improving California's quality of life.



- Populated Place
- BNSF Rail Line
- Study Area Segment
- Half-Mile Radii of Study Area Segments
- 1.1 State and Federal Land
- 3.1 Parks and Recreation Areas
- 3.2 Educational Facilities
- 3.3 Other Facilities
- 3.4 Solid Waste Disposal Facilities
- 4.3 Specific Plan Required
- 5.2 Max 16 Units/Net Ac
- 5.3 Max 10 Units/Net Ac
- 5.35 Max 7 Units/Net Ac
- 5.4 Max 4 Units/Net Ac
- 5.45 Max 2 Units/Net Ac
- 5.5 Max 1 Unit/Net Ac
- 5.6 Min 2.5 Gross Ac/Unit
- 5.7 Min 5 Gross Ac/Unit
- 5.8 Min Gross 20 Ac/Unit
- 6.2 General Commercial
- 6.3 Highway Commercial
- 7.1 Light Industrial
- 7.3 Heavy Industrial
- 8.1 Intensive Agriculture (Min.20 Ac Parcel)
- 8.2 Resource Reserve (Min.20 Ac Parcel)
- 8.3 Extensive Agriculture (Min.20 or 80 Ac Parcel)
- 8.5 Resource Management (Min.20 or 80 Ac Parcel)
- Agricultural
- Residential
- Specific Plan Area Boundary (S.P.)

0 1 2 Miles

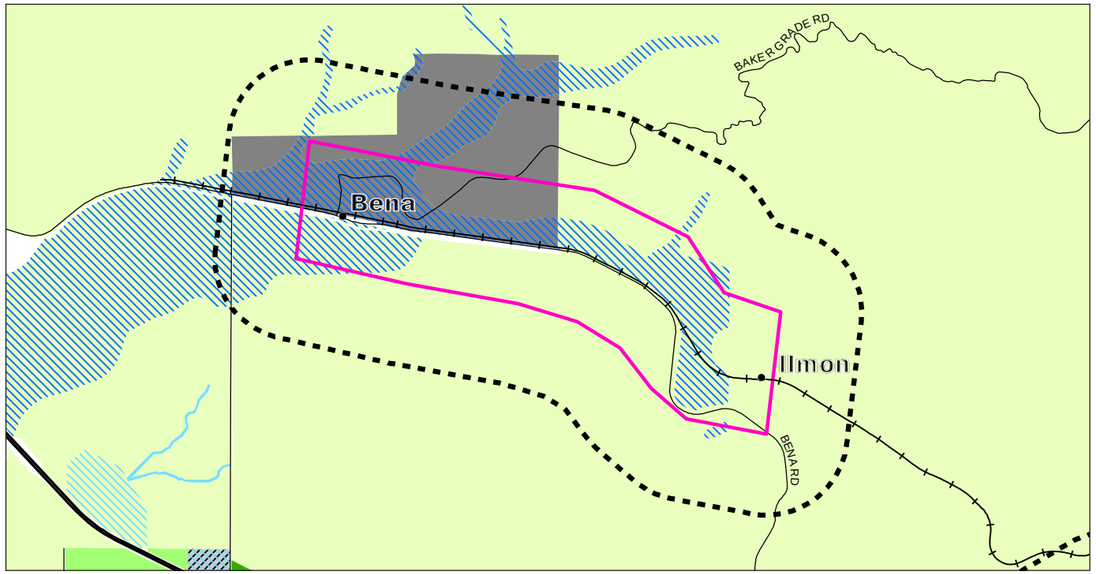


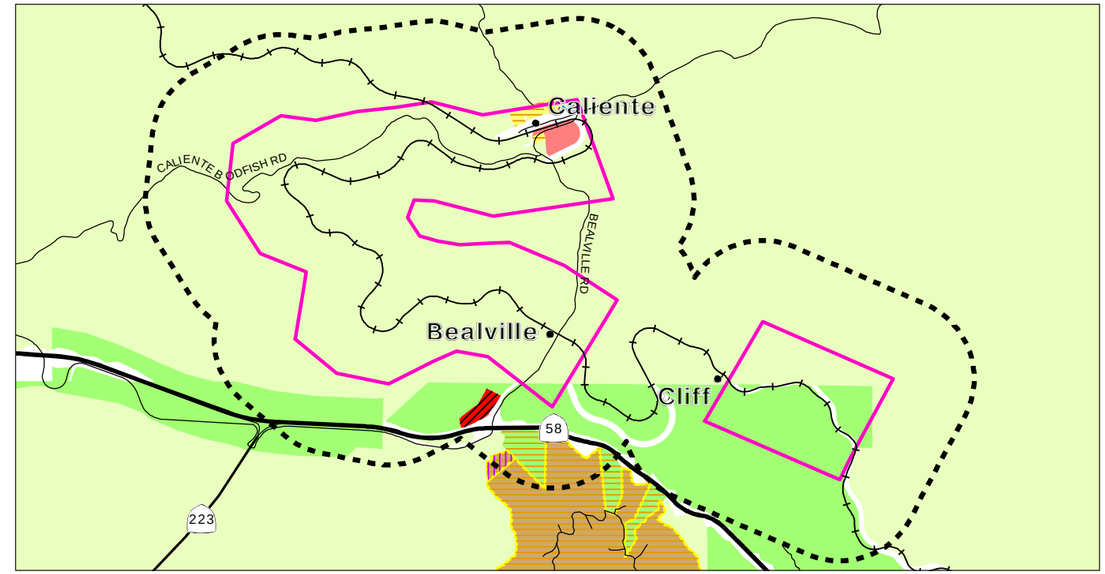
BNSF/UPRR Mojave Subdivision Tehachapi Rail Improvement Project

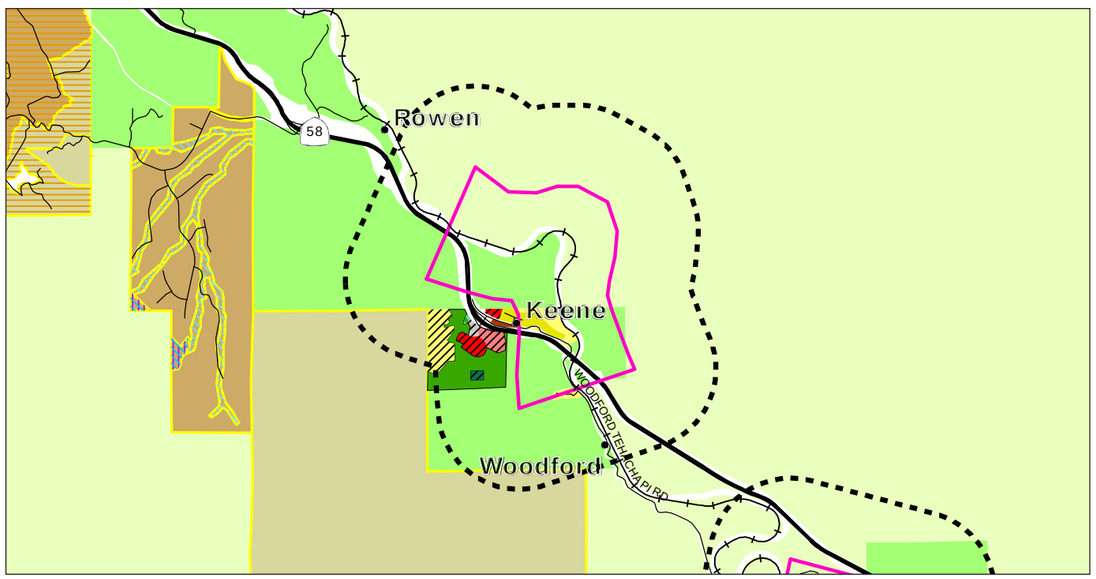
General Plan and Specific Plan Land Use

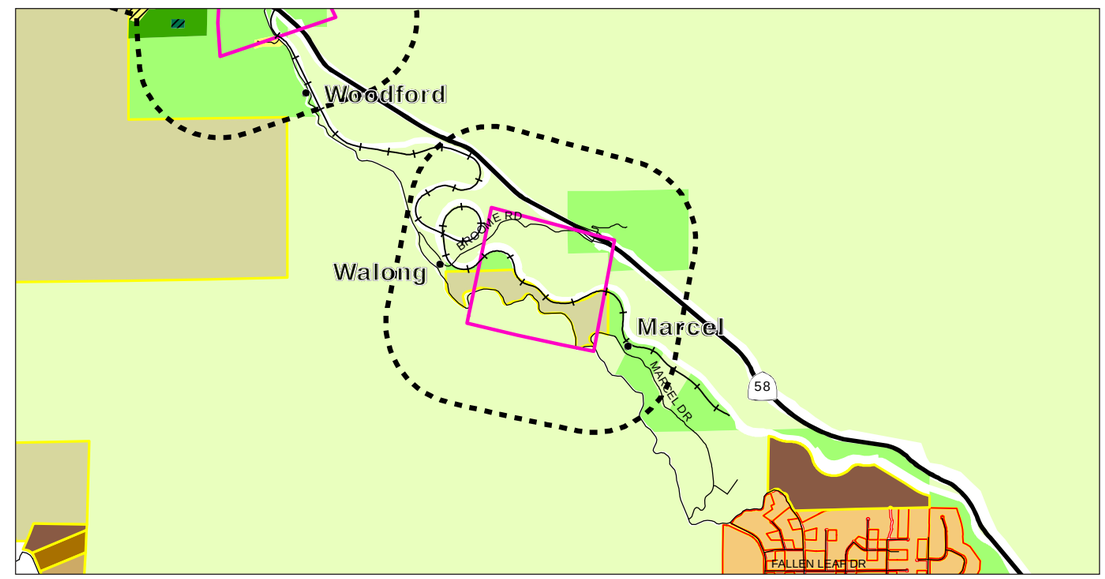
July 2010	Figure 2.1-1

Sources: Kern County GIS Department









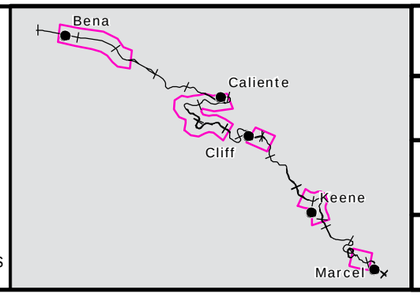
- Populated Place
- BNSF Rail Line
- Study Area Segment
- Half-Mile Radii of Study Area Segments

- Exclusive Agriculture (A)
- Limited Agriculture (A-1)
- Estate 1 Acre (E[1])
- Estate 2 1/2 Acres (E[2 1/2])
- Estate 5 Acres (E[5])
- Estate 10 Acres (E[10])
- Estate 20 Acres (E[20])
- Low Density Residential (R-1)
- Medium Density Residential (R-2)
- Neighborhood Commercial (C-1)
- General Commercial (C-2)
- Highway Commercial (CH)
- Light Industrial (M-1)
- Heavy Industrial (M-3)
- Recreation-Forestry (RF)
- Open Space (OS)
- Floodplain Primary (FPP)

Combining Districts

- Floodplain (FP)
- Floodplain Secondary (FPS)
- Geological Hazard (GH)
- Mobile Home (MH)
- Precise Development (PD)
- Residential Suburban (RS)

0 1 2 Miles



BNSF/UPRR Mojave Subdivision Tehachapi Rail Improvement Project

Zoning

July 2010	Figure 2.1-2

Sources: Kern County GIS Department/JL Patterson & Associates

Environmental Consequences

Build Alternative

Construction and Operational Impacts

Construction and implementation of the proposed project would not greatly alter land uses in the surrounding area. The future land use designation surrounding the project area would remain consistent with the Land Use Element of the Kern County General Plan. But, the project would remove a certain amount of acreage from the current Williamson Act usages and result in future use changes from the exclusive agricultural preserve function to non-agricultural uses (see discussion in Section 2.1.2 Farmlands/ Timberlands).

Although most of the construction activities would occur within the existing railroad right-of-way, a small portion of the proposed activities would occur outside on predominantly privately owned lands with agricultural grazing functions. The total amount of land that would be acquired or disturbed during construction (including grading, excavation, slope modification, extension of existing culverts) and operation is approximately 37 acres. This minor amount makes up less than 2% of total area that would be affected by the project. This impact to land area designated for agricultural uses does not require further evaluation because the project would not affect prime farmlands and other farmland of statewide importance, as defined by the Natural Resources Conservation Service and the Williamson Act.

The proposed track would not result in any physical division to any greater extent than the tracks already divide the communities in the area. Established communities next to the existing rail alignment as well as current Kern County land use plans and policies would not be significantly affected by the construction or operation of the proposed project. So, the project would be compatible with the current Kern County General Plan, the Keene Rural Community Plan, and the Keene Ranch Specific Plan. In addition, the project would not affect habitat conservation or natural community conservation plans (see the additional discussion and detailed information in Section 2.3 Biological Resources).

No-Build Alternative

The No-Build Alternative would allow the continuation of existing rail services; no impacts to existing or future land uses are anticipated.

Avoidance, Minimization, and/or Mitigation Measures

None required.

2.1.2 Farmlands/Timberlands

Regulatory Setting

The California Environmental Quality Act requires the review of projects that would convert Williamson Act contract land to non-agricultural uses. The main purposes of the Williamson Act are to preserve agricultural land and to encourage open space preservation and efficient urban growth. The Williamson Act provides incentives to landowners through reduced property taxes to deter the early conversion of agricultural and open space lands to other uses.

Affected Environment

The project is not located on lands classified as Prime Farmland, Farmland of Statewide Importance, Unique Farmland, or Farmland of Local Importance. As shown in Figures 2.1-3, Important Farmlands, the study area surrounding the project segments is predominately classified as grazing land by the Farmland Mapping and Monitoring Program, except for some residential areas in Keene and Caliente. No impacts would occur to these residential areas. As discussed in Section 2.1.1 Land Use and Planning, the project would also affect land zoned by the County of Kern for agricultural purposes and used as such.

Environmental Consequences

Build Alternative

Construction, Operational and Cumulative Impacts

The project would affect portions of parcels contracted under the Williamson Act. Construction and operation of the second track would result in permanent acquisition and temporary use of the lands within and outside the railroad right-of-way. The total amount of disturbance outside the existing right-of-way would permanently convert approximately 23 acres of agricultural lands to non-agricultural uses. Approximately 86%, or 20 acres out of 23 acres, of the affected area falls under Williamson Act contracts as shown in Figure 2.1-4 Williamson Act Lands. All of the areas affected by the Williamson Act contracts are classified as non-prime farmlands.

An additional 14 acres of land would be affected by construction activities during grading, excavation, cut and fill, slope changes, and culvert extension. These lands would be temporarily affected by construction activities and used as staging areas. No change to land use on the temporarily affected areas is expected after construction is done.

Table 2.1-1, Williamson Act Lands, lists the Williamson Act parcels and acreages affected by the project. The percentage of Williamson Act take for each parcel is less than 5% for all parcels, except for Assessor's Parcel Number 179-170-02, which has a higher percentage due to the parcel's modest (fewer than 4 acres) size. The total Williamson Act permanent and temporary take percentage is less than 1% of the combined total acreage (6,586.18 acres) of all eight affected Williamson Act parcels and less than 0.01% of the 2.7 million acres of inventoried agricultural lands reported in the California Department of Conservation's 2004–2006 Land Use Conversion Table for Kern County.

Table 2.1-1 Williamson Act Lands

Assessor's Parcel Number	Segment	Total Parcel Acreage	Perm. Take (acres)	Temp. Take (acres)	Total Take (acres)	% Perm. Take to Entire Parcel	% Temp. Take to Entire Parcel	% Total Take to Entire Parcel
179-050-05	Bena-to-Ilmon	332.04	0.62	0.76	1.38	0.19	0.23	0.42
179-170-02	Bena-to-Ilmon	3.70	0.58	0.39	0.97	15.68	10.54	26.22
179-180-03	Caliente-to-Bealville	44.71	1.23	0.27	1.50	2.75	0.60	3.35
179-180-06	Caliente-to-Bealville	223.59	7.51	0.37	7.88	3.36	0.17	3.52
179-190-13	Caliente-to-Bealville	580.28	9.01	2.96	11.97	1.55	0.51	2.06
397-210-06	Cliff Siding Extension	5308.59	-	0.37	0.37	-	0.01	0.01
505-050-04	Walong-to-Marcel	59.36	0.38	1.14	1.52	0.64	1.92	2.56
505-050-18	Walong-to-Marcel	33.91	0.28	0.95	1.23	.83	2.80	3.63
Totals		6,586.18	19.61	7.21	26.82	0.30	0.11	0.41

Source: Kern County Assessor File 2008

Pending County decision, the proposed project may require the removal of identified lands from the Williamson Act contract. The Williamson Act program restricts land uses to agricultural related uses. Railroad right-of-way is not a permitted land use under this program and would be considered a breach of the Williamson Act contract, subject to the interpretation of the County. In addition, temporary take acreages may also be considered a breach of contract and require removal from the Williamson Act contracts. A petition to the Kern County Board of Supervisors for cancellation of the Williamson Act contracts may be necessary to acquire the necessary parcels in the study area. A fee equal to 12.5% of the unrestricted current fair market value of the land would be assessed for the cancellation of the contract. Alternatively, take parcels may also be acquired under threat of condemnation, by voiding the contract. In this case, BNSF Railway and Union Pacific Railroad must advise the Director of Conservation and the County Board of Supervisors of its intention to consider the location of a railway facility on the agricultural land. When

the Williamson Act contract land is condemned or acquired under threat of condemnation, the lands would no longer be used for agricultural preserve function as specified under the contract.

The identified permanent and temporary take parcels for the project are next to existing railroad rights-of-way on non-prime farmlands classified as grazing lands by the Farmland Mapping and Monitoring Program and designated for agricultural uses under the Kern County General Plan Land Use Plan and Zoning map. The project would not affect prime farmlands or other farmland of statewide importance, as defined by the Natural Resources Conservation Service and the Williamson Act. Although about 72% of the identified take parcels are under Williamson Act contracts, the take parcels are located on non-prime farmlands used for grazing. The Build Alternative would convert less than 1% of affected Williamson Act parcels to nonagricultural/right-of-way uses. Since these Williamson Act parcels are located near the edges of the existing railroad right-of-way uses and are not designated as prime-farmlands, the conversion of these parcels would not reduce the value and function of these lands.

In addition, since identified take parcels are next to existing rail rights-of-way, it is unlikely that the project would cause segmentation of agricultural lands and potential indirect effects associated with segmentation. Project impacts to farmlands would be minimal due to the small amount of acreage affected and the location of the parcels.

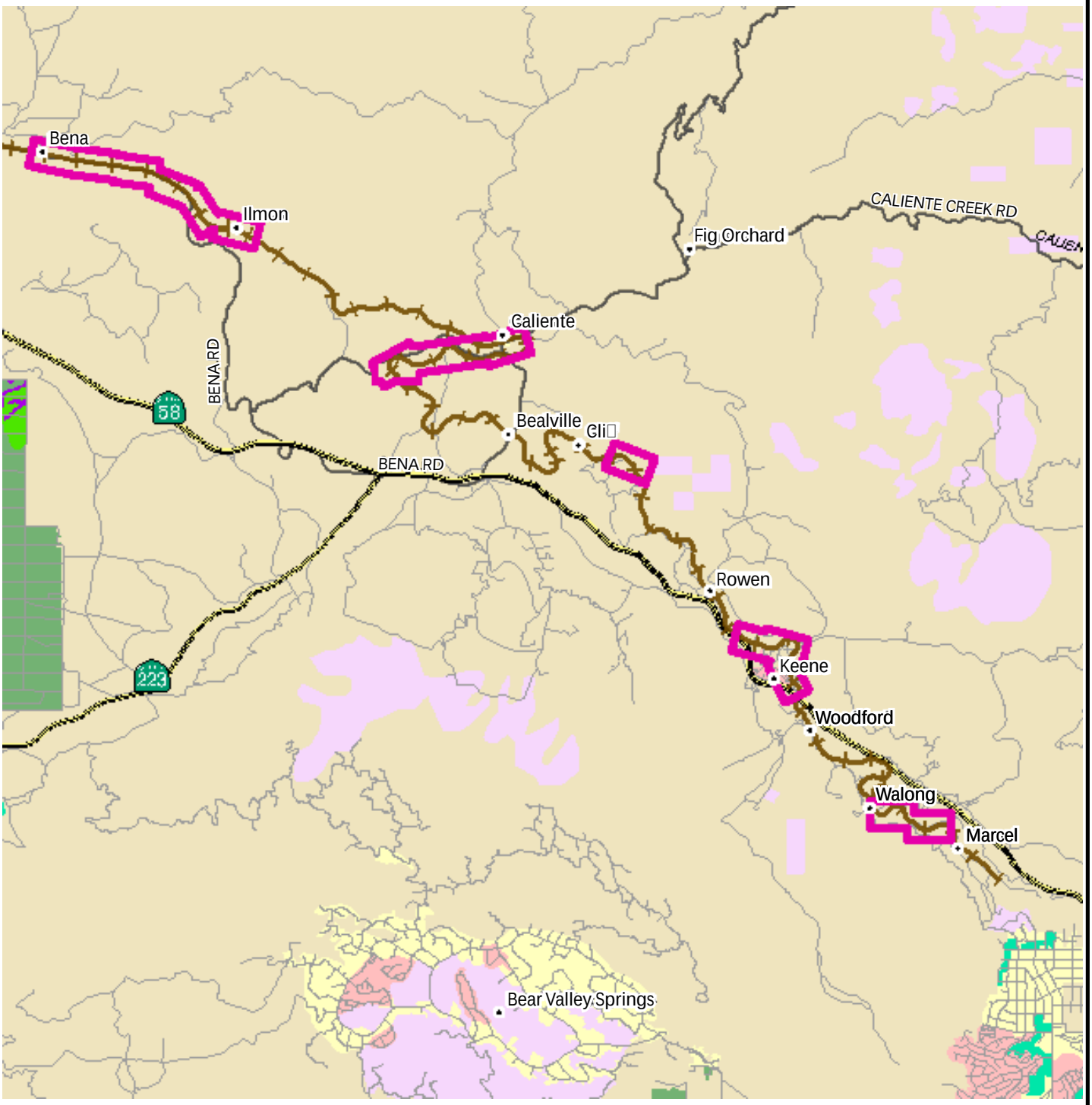
No-Build Alternative

Under the No-Build Alternative, no project improvement would occur. The non-prime farmlands classified as grazing lands by the Farmland Mapping and Monitoring Program would remain grazing farmlands. No impact would occur to the farmlands, which would be preserved for agricultural use.

The Williamson Act provisions would continue to provide preservation for lands that are obligated under a Williamson Act contract. Removal of agricultural use or conversion of land to non-agricultural use is not anticipated on the approximately 26.82 acres of land that would be removed from a Williamson Act contract.

Avoidance, Minimization, and/or Mitigation Measures

No mitigation for impacts to farmland is required.



Legend

- BNSF Rail Line
- Study Area Segment
- Prime Farmland (P)
- Farmland of Statewide Importantce (S)
- Grazing Land (G)
- Urban and Built-Up Land (D)
- Con□ned Animal Agriculture (Cl)
- Rural Residential Land (R)
- Unique Farmland (U)
- Vacant or Disturbed Land (V)
- Nonagricultural and Natural Vegetation (nv)
- Semi-Agricultural and Rural Commercial Land (sAC)

0 2.3 4.6 Mile

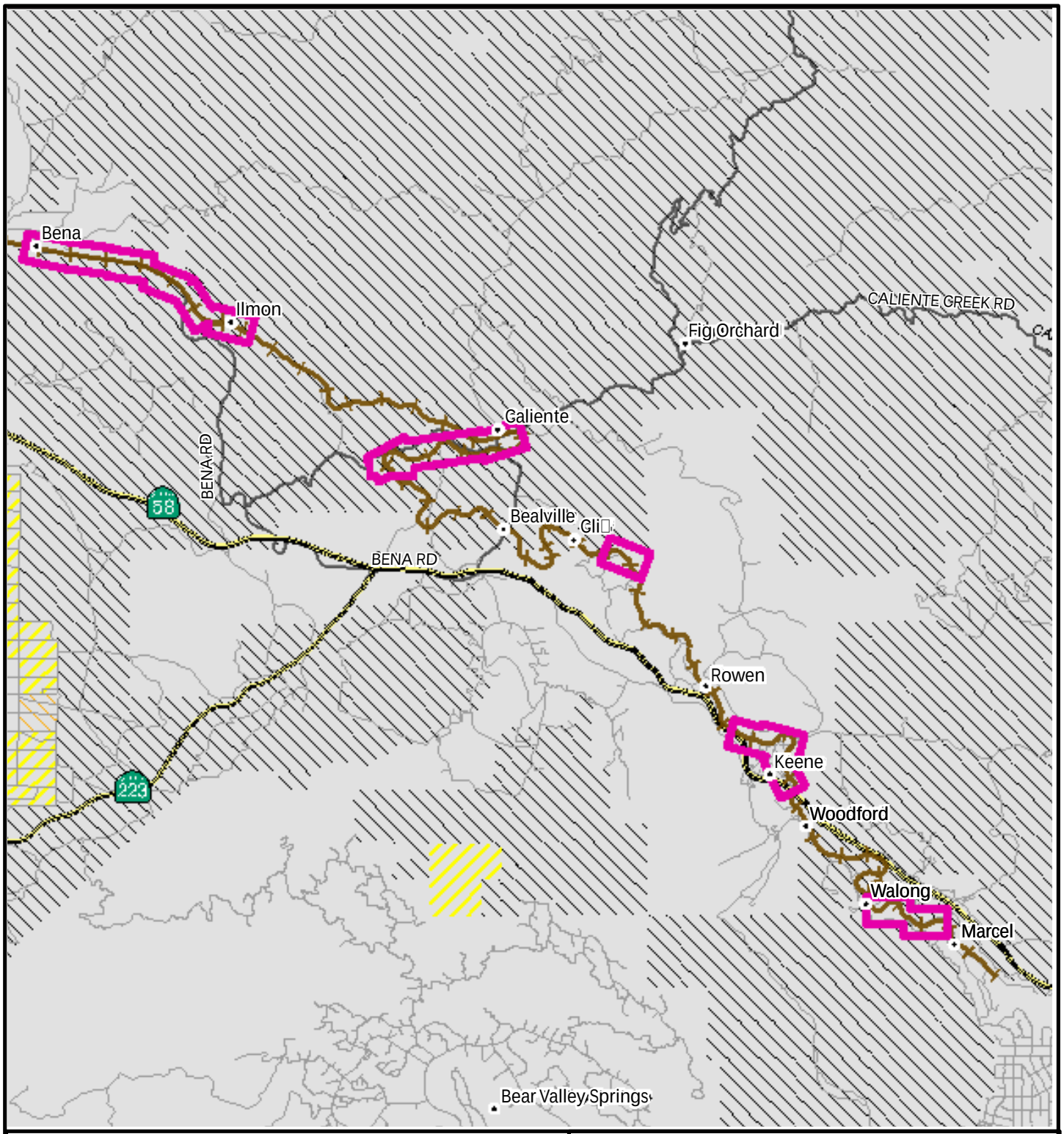
BNSF/UPRR Mojave Subdivision Tehachapi Rail Improvement Project

Important Farmlands

July 2010

Figure 2.1-3

Sources: Kern County GIS department



Legend

- BNSF Rail Line
- Study Area Segment
- Williamson Act - Prime Land
- Williamson Act - Non-Prime Land
- Williamson Act - Farmland Security Zone Land

N

0 2.3 4.6 Mile

BNSF/UPRR Mojave Subdivision Tehachapi Rail Improvement Project

Williamson Act Lands

July 2010	Figure 2.1-4

Sources: Kern County GIS department

2.1.3 Community Impacts

Regulatory Setting

Under the California Environmental Quality Act, an economic or social change by itself is not to be considered a significant effect on the environment. However, if a social or economic change is related to a physical change, then social or economic change may be considered in determining whether the physical change is significant. Since this project would result in physical change to the environment, it is appropriate to consider changes to community character and cohesion in assessing the significance of the project's effects.

Affected Environment

The project is not within or near a metropolitan area. The nearest population centers are the towns of Keene and Caliente.

Keene is a census-designated community in the foothills (Woodford area) of the Tehachapi Mountains. As of the 2000 Census, 339 people, 136 households, and 99 families resided in Keene. This community is also home to the National Chavez Center and the burial site of Cesar Chavez.

Caliente is an unincorporated community in Kern County with a population of 1,019. It is 22 miles east-southeast of Bakersfield, along the track of the Union Pacific Railroad.

Environmental Consequences

Build Alternative

Construction Impacts

The established residential communities of Keene and Caliente next to the proposed project would not be affected as a result of temporary take of land. The workers employed by the Cesar Chavez Foundation and residents next to the Caliente segment would experience temporary disruptions due to noise and vibration from construction. No existing or future population would be affected. Construction of the proposed project would not induce substantial growth either directly or indirectly; therefore, it would not be necessary to build additional housing as a result of the displacement of people or housing. No impacts related to communities would result from the proposed project.

Operational Impacts

The established communities next to the proposed project would not be affected. The operation of the proposed project would not induce growth within the region; people or

housing would not be displaced. Trains would continue to run and would not physically divide any existing communities. No impacts related to communities would result from the proposed project.

No-Build Alternative

Under the No-Build Alternative, no double-track would be added. Rail services would continue to operate as they do now. Track improvements would not take place. The No-Build Alternative would not affect established communities, population, or housing.

Avoidance, Minimization, and/or Mitigation Measures

None required.

2.1.4 Public and Emergency Services

Affected Environment

The project rail segments would sit within the unincorporated areas of Kern County. Public and emergency services are provided by the County of Kern and a variety of local agencies and providers.

Public Services

Schools

Caliente Elementary School within the Caliente Union Elementary School District is the only school identified within the 2-mile radius of the project area that provides education serving the public communities of Caliente. The school sits at 27500 Caliente Bodfish Road in Caliente.

Solid Waste

The Kern County Waste Management Department manages the local solid waste services and operates seven landfills, five transfer stations, four transfer bins, and two special waste facilities sites in the county. Solid waste generated by the surrounding communities is disposed of at any of the three landfills located within the vicinity of the project: Bakersfield Metropolitan (Bena) Landfill, Tehachapi Landfill, and Mojave-Rosemond Landfill. All three are permitted as Class III and have a combined design capacity of 4,912 tons per day. Class III landfills accept only non-hazardous solid waste for disposal. Special wastes would be transported to the Kern County Special Waste Facility Eastern Region in Mojave.

Emergency Services

Emergency services, which include fire, police, and ambulance services, are vital in the operation of cities and counties. Projects that involve street closure, street modification, or traffic diversion to complete construction have the potential to impede the access to or delivery of emergency services. Public service facilities near the railroad right-of-way where the proposed project would be built are described below and identified in Figure 2.1-5, Public Services and Facilities.

Additionally, the project could have an adverse environmental effect if the project creates demand for additional services and the concurrent need for alteration or construction/expansion of infrastructure required to support new public services.

The California Department of Forestry identifies the degree of fire risks based on the severity of fire hazard that is expected to prevail. Fire zones are identified based on factors such as fuel (material that can burn), slope and fire weather. Fire Hazard Severity Zone Maps developed by the California Department of Forestry show that most of the project area is within fire-prone areas (Figure 2.1-6). Two project segments (Bena-to-Ilmon and Caliente-to-Bealville) are classified as a Moderate Fire Hazard Severity Zone; the other three segments (Cliff Siding Extension, Rowen-to-Woodford, and Walong-to-Marcel) are classified as a Fire Hazard Severity Zone. Minimization and mitigation measures (noted in Chapter 2.2.5 Hazardous Waste or Materials) implemented during the project's construction phase would reduce impacts from potential wildfire hazard.

The Kern County Fire Department would respond to fire emergencies in the project segment areas. In some cases, state agencies (the California Department of Forestry and Fire Protection) may respond to fires within the Cliff Siding project segment, immediately adjacent to state property where these agencies have jurisdiction (Figure 2.1-7). However, the Kern County Fire Department would respond to any and all fire emergencies in the study area.

The Kern County Fire Department operates 46 fire stations. The Kern County Fire Department station that serves the project area is the Keene Fire Station (FS#11) in the unincorporated area of Keene at 30356 Woodford-Tehachapi Road. This station is about one-half mile west of the proposed Rowen-to-Woodford project segment. It is estimated that the average response time would be 8 to 10 minutes from Keene to Bena and about 10 minutes from Keene to Walong-Marcel. The response time would depend on how close the emergency site was as well as the road conditions (how accessible the site is to the highway, weather, etc.).

The Kern County Sheriff Department provides police protection services in the project area. The Tehachapi substation at 22209 Old Town Road in the community of Golden Hills serves the project area. The sheriff station serves all of the unincorporated areas, about 572 square miles.

Police response times are variable, depending on the distance and terrain. Due to the mountainous terrain, police radio service can be inconsistent. Response times for police protection services are estimated to range from 10 to 30 minutes, depending on road conditions, proximity of the dispatched deputies to the area of need, accessibility to nearest highways and roads, among other factors.

The Union Pacific Railroad and BNSF Railway provide private, internal security for its railroad operations and infrastructure. The railroads' rail operations do not place any routine or ongoing demand on local police services. In accident situations or illegal trespass on railroad property, local police may be contacted to help with either emergency response or enforcement of trespass laws on local trespassers.

Environmental Consequences

Build Alternative

Schools

The project would not result in any direct or indirect demand for school capacity at this time. Schools are at a safe distance from the project and would not be exposed to any indirect effects from rail operations, except distant background noise.

Solid Waste

The project would not generate substantial amounts of solid waste. The project would remove materials such as rocks, soil, and vegetative wastes, which would be trucked back to other segments of the project site and used to fill those sites. Excess solid waste generated by the project would be disposed at the Bakersfield Metropolitan (Bena) Landfill or the Tehachapi Landfill sites. Existing waste disposal facilities and operations are adequate to serve the needs of the project; therefore, minimal impacts are anticipated to solid waste collection or disposal resources.

Fire Protection

After completion of the project, freight train frequency would increase, but trains traveling along the corridor would remain as an exclusively freight rail operation and should not require a major increase in fire protection services. The proposed project would not result in substantial adverse physical impacts associated with the provision of

new or physically altered fire protection facilities, or require the construction of new or physically altered fire protection facilities. As standard practice, the railroad's emergency dispatchers and response team also regularly improve the maintenance road system to ensure that the roads provide ready access in case of emergency.

A potential minimal delay in response times for emergency services would be experienced during project construction at segments where grade crossings are involved, due to work crews, heavy machinery, and other temporary and sporadic day-to-day obstructions to roads.

Police Protection

The project would expedite freight service in the corridor and reduce the duration of train travel time in the study area. Access to the railroad right-of-way would improve because of maintenance road reconstruction. The project would not result in substantial adverse physical impacts associated with the provision of or need for new or physically altered police facilities.

An increase in activity along the alignment would occur mainly due to construction activities. Temporary delays may be experienced on the segment of Bealville Road and Caliente Bodfish Road through the project construction area. It is anticipated that the proposed project would not significantly increase the need for or delay police services during construction or operation of the project. A traffic management plan would be implemented to ensure that a minimum of one lane would remain open to allow for access through the roads.

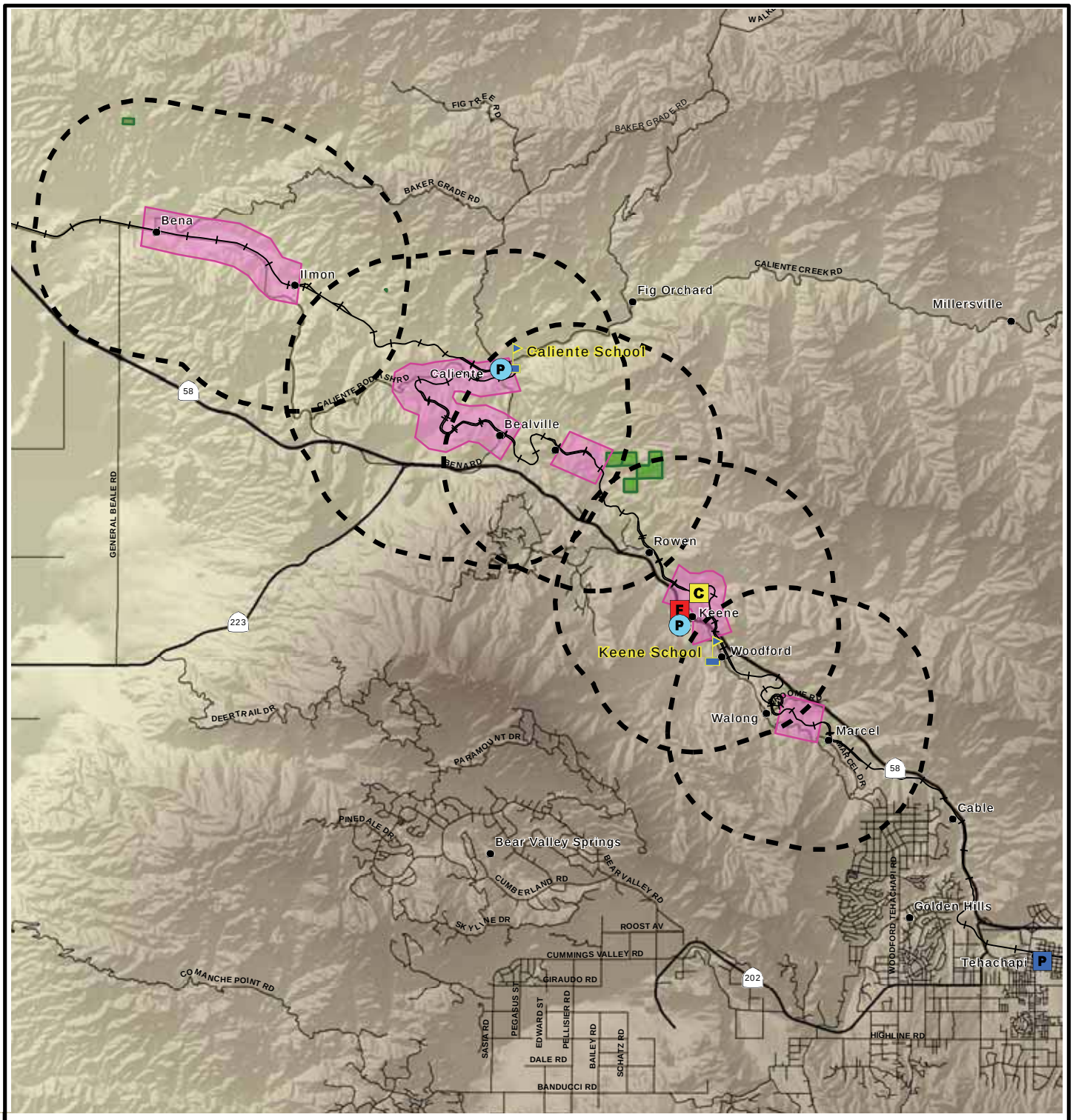
No-Build Alternative

Public and Emergency Services

Under the No-Build Alternative, construction and operational impacts would not occur to operations or services provided by public or emergency service agencies serving the project areas.

Avoidance, Minimization, and/or Mitigation Measures

If road closures occur at the time of project construction, a traffic management plan would be implemented. See Section 2.1.5, Traffic and Transportation/Pedestrian and Bicycle Facilities.



LEGEND

- Populated Place
- National Chavez Center
- Keene Fire Station
- Tehachapi Sheriff Sub-Station
- School
- BNSF Rail Line
- Study Area Segment
- 2-Mile Radii of Study Area Segments
- Bureau of Land Management (BLM) Land

0 2 Miles

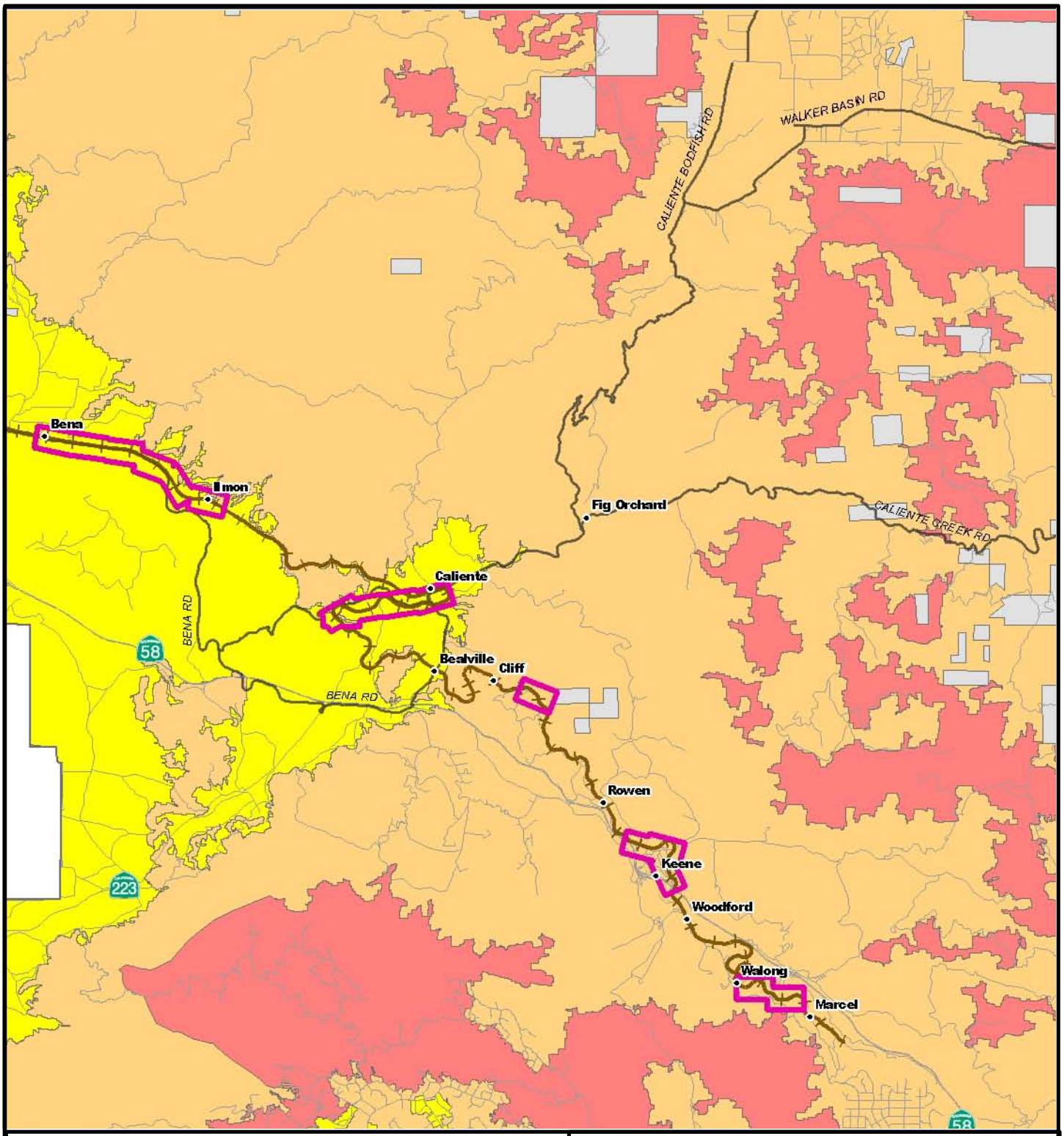
BNSF/UPRR Mojave Subdivision Tehachapi Rail Improvement Project

Public Services and Facilities

July 2010

Figure 2.1-5

Sources: Kern County GIS department, Fire & Sheriff's Department



Legend

- BNSF Rail Line
- Study Area Segment

Fire Hazards Severity Zones in (SRA)

- Moderate
- High
- Very High
- Local Responsibility Area (LRA) - Unincorporated
- Federal Responsibility Area (FRA)

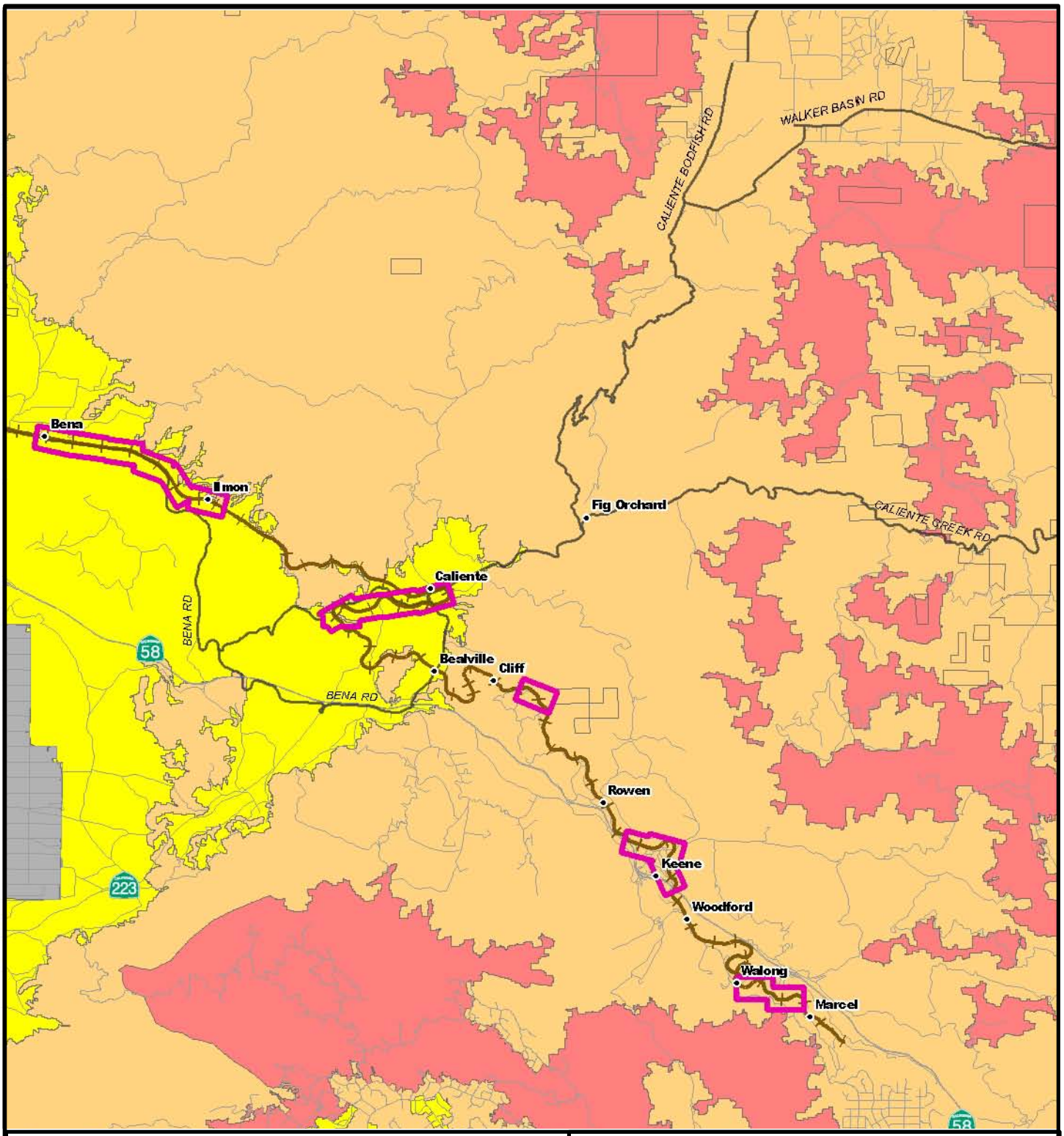
0 0.5 1 2 Miles

BNSF/UPRR Mojave Subdivision Tehachapi Rail Improvement Project

Fire Hazards Severity Zone Map State Responsibility Area (SRA)

July 2010 | **Figure 2.1-6**

Sources: California Department of Forestry



Legend

- BNSF Rail Line
- Study Area Segment

Fire Hazards Severity Zones in (LRA)

- Moderate
- High
- Very High
- Non-Wildland/Non-Urban

0 0.5 1 2 Miles

BNSF/UPRR Mojave Subdivision Tehachapi Rail Improvement Project

Fire Hazards Severity Zone Map Local Responsibility Area (LRA)

July 2010	Figure 2.1-7

Sources: California Department of Forestry

2.1.5 Traffic and Transportation/Pedestrian and Bicycle Facilities

Regulatory Setting

Caltrans is committed to carrying out the 1990 Americans with Disabilities Act (ADA) by building transportation facilities that provide equal access for all persons. The same degree of convenience, accessibility, and safety available to the general public will be provided to persons with disabilities.

Affected Environment

The discussion below identifies existing transportation facilities, including at-grade intersections, that could potentially be affected by the project.

There are no bikeways, bicycle facilities, or pedestrian facilities in the project area. The project is not covered by the networks identified by the Kern Council of Governments Bicycle Facilities Plan, as adopted by and referenced in the Kern County General Plan. Consequently, there is no further discussion on Pedestrian and Bicycle Facilities in Section 2.1.5.

Existing Transportation Facilities—Regional

State Route 58 is a major regional roadway serving Kern County. Originating from the Interstate 15 Interchange in Barstow in San Bernardino County, State Route 58 runs east-west through Kern County toward its western end at Highway 101 in Santa Margarita in San Luis Obispo County. Within the project area, State Route 58 is a four-lane divided highway that serves the City of Tehachapi and communities in southeast Kern County.

According to the Caltrans-prepared Kern County Truck Study, truck traffic makes up 30% to 40% of traffic on State Route 58. A majority of the traffic on the Tehachapi segment of State Route 58 is regional truck traffic. Local traffic is only 5% of the total traffic of State Route 58.

Existing Transportation Facilities—Local

Public Roadway Facilities

- Bealville Road is a two-lane road that runs north-south through the project area in the community of Caliente. An existing at-grade crossing is at mile post 335.94.
- Caliente Bodfish Road is a two-lane road that runs north-south through the project area. An existing at-grade crossing is at mile post 335.47.

- Bena to Ilmon Segment: There would be construction staging at Bena Road. Temporary blockage to Bena Road would be anticipated. There are no identified grade crossings in this segment.
- Caliente-to-Bealville Segment: Two grade crossings are identified in this segment—a local privately owned road and the Caliente Bodfish Road crossing. In addition, Bealville Road crosses the railroad track at the same mile post.
- Cliff Siding Extension Segment: One private grade crossing is identified in this segment—a private road at mile post 343.35.
- Rowen to Woodford Segment: One private grade crossing is identified in this segment—a private road at mile post 347.65.
- Walong to Marcel Segment: One private grade crossing is identified at this segment—a private road at mile post 352.80.

Pedestrian and Bicycle Facilities

According to the 2001 Kern Council of Governments Bicycle Facilities Plan, as adopted and referenced in the Kern County General Plan, no bikeways are planned in the project area, nor have any bikeways or bicycle facilities been previously built. Because less than 1% of commuters within the project area use bicycles, there are no proposed bicycle facilities.

Environmental Consequences

Build Alternative

State Route 58

State Route 58 is a significant distance from the project construction site except for the track segment from Rowen to Woodford. No impact to the roadway traffic would occur as a result of improving the railroad track at this segment.

Caliente Bodfish Road

During construction of the double-track segment next to Caliente Bodfish Road at mile post 335.47, traffic would have to be routed through an adjacent private grade crossing at mile post 335.28. There would be a brief increase in traffic at this location because of the increased delay at crossings and potential detour that might affect crossings at this location. The delays at the crossings and increased gate down time would be minor and would have minimal effect on response time during construction.

Bealville Road

During the construction of the double-track segment at Bealville Road, a new bridge would be built over Tehachapi Creek and the road at mile post 335.94. It is anticipated that short-term disruption to local traffic using Bealville Road may occur as a result of construction activity next to the roadway. The placement of bridge spans can be accomplished using cranes, and with adequate protection and safety measures, the roadway would remain in operation during construction. Other construction activities such as work on bridge abutments and supports as well as any erosion control work outside of the traveled way can be accomplished without interfering with local traffic.

Caliente-to-Bealville Segment

The Caliente Bodfish Road crossing and the private grade crossing at mile post 335.28 would be temporarily affected during construction due to work crews, heavy machinery, and other temporary and sporadic day-to-day obstructions. BNSF Railway would upgrade and improve existing crossings and provide temporary crossings during construction. Because the crossing at Caliente Bodfish Road is a California Public Utilities Commission-approved crossing, change to this public grade crossing would require compliance with all regulatory and permitting requirements specified by the California Public Utilities Commission for traffic and access crossings at locations where railroad facilities exist.

Cliff Siding Extension Segment

The private grade crossing at mile post 343.35 and the private road leading to that crossing would be temporarily inaccessible during construction.

Rowen-to-Woodford Segment

The private grade crossing at mile post 347.65 and the private road leading to that crossing would be temporarily inaccessible during construction.

Walong-to-Marcel Segment

The private grade crossing at mile post 352.80 and the private road leading to that crossing would be temporarily affected. A Traffic Management Plan would be prepared by BNSF Railway to reduce and minimize impacts.

It is anticipated that minor impacts related to traffic would occur as a result of the construction of the Build Alternative following mitigation because the project would not cause an increase in traffic that is substantial in relation to the existing traffic load and capacity of the street system.

Operational Impacts

Project operation would not contribute to an increase in vehicular traffic or add to the current vehicular traffic capacity of the system. The trains would continue to run on the fixed guide-way and would not require the use of roads. The anticipated increase in train movements would not substantially affect the capacity of the street system within the project area. As a result, project operations would not contribute to an increase in vehicular traffic that exceeds local level of service standards (see Appendix F: Rail Crossing Delay Analysis).

Project operations would not introduce any design features resulting in a substantial increase in roadway hazards. Some at-grade roadway crossing improvements at Caliente Bodfish Road and Bealville Road, such as improved crossing approaches and crossing equipment upgrades, would actually reduce roadway hazards.

The proposed plan for rail improvement agrees with the adopted policies, plans, or programs supporting alternative transportation. There are no alternative transportation amenities currently in place or being contemplated in the project area. Consequently, no revisions to existing plans and policies are proposed or would be required.

No-Build Alternative

Construction, Operational and Cumulative Impacts

Under the No-Build Alternative, the project would not be built and the existing conditions would remain unchanged. No significant impacts related to construction and operational traffic, as well as cumulative impacts, would occur as a result of the No-Build Alternative. While the project would not contribute to increasing freight traffic congestion, the freight traffic could extend into the project area and into San Joaquin Valley as a result of existing congestion. If the No-Build Alternative is adopted and the number of trains increases, some congestion could occur in the project segment from traffic coming from the Barstow and Bakersfield yards. The trains coming from these yards may be moving in a slower time slot through the project area because the Bakersfield-Mojave segment is approaching capacity. There is the potential for indirect impact as a result of the No-Build Alternative.

Avoidance, Minimization, and/or Mitigation Measures

Minimization Measures

If a portion of Bealville Road must close for a limited time due to bridge construction, short-term impacts to traffic and circulation may occur. The short-term increases in construction-related traffic could be reasonably accommodated by the low-traffic-volume

roadways serving the project site—specifically, a re-route of southbound Bealville Road traffic west on Caliente Bodfish Road, south and then east on Bena Road to White Wolf Road to State Route 58, or continue east on Bena Road to the segment of Bealville Road south of the closure area. Northbound traffic can be routed in the opposite direction of the southbound route.

During project construction, potential impacts to traffic may occur, resulting in delayed traffic at existing railroad crossings. To avoid or minimize these impacts, the project proponent would proactively and to the extent feasible implement the following measures:

- BNSF Railway and its contractor shall obtain Construction-Related Road Closure permits from the County of Kern Roads Department when construction would affect local roads and bridges and when alternative routes or detours at existing railroad crossings would be needed.
- The applicant would obtain related permits from the California Public Utilities Commission for improvements of the public grade crossing at Caliente to Bealville and the new bridge at mile post 328.21 over Bealville Road.
- A minimum of one open lane for traffic at two-lane roadways would be maintained if there are no options for detours at roadway crossing work zones.
- BNSF Railway and its contractor shall coordinate with Caltrans and the County of Kern Public Works Department to implement a public awareness campaign advising motorists and local residents on the dates of construction and details of potential road closures.
- BNSF Railway and its contractor shall coordinate with the County of Kern Roads Department to provide advance warning signs in construction zones to mitigate conflicts between construction activities and vehicular traffic.
- BNSF Railway and its contractor shall provide flagmen to direct traffic at construction areas next to public roadways to mitigate conflicts between construction activities and vehicular traffic, if warranted.

2.1.6 Visual/Aesthetics

Regulatory Setting

The California Environmental Quality Act (CEQA) establishes that it is the policy of the state to take all action necessary to provide the people of the state “with…enjoyment of

aesthetic, natural, scenic and historic environmental qualities." (CA Public Resources Code Section 21001[b])

Affected Environment

A visual impact analysis was prepared for the project and is provided in the Combined Technical Reports document associated with this Mitigated Negative Declaration. See the Aesthetics/Visual Resources Impact Assessment.

The Greater Tehachapi region sits in eastern Kern County along State Route 58 between the San Joaquin Valley and the Mojave Desert. The Greater Tehachapi region is known for its four seasons, rural communities, Tehachapi Loop, electricity-generating wind turbines, proximity to Edwards Air Force Base, and gliding. The Greater Tehachapi region generally refers to the City of Tehachapi and the surrounding rural communities of Alpine Forest, Golden Hills, Stallion Springs, Bear Valley Springs, Cummings Valley, Cummings Ranch, Keene, Cameron Canyon, Sand Canyon, Mendiburu Springs, Monolith, Old Town, Old West Ranch, and Brite Valley. The project is not located within or near any designated scenic vistas, within view from any state-designated scenic highways or locally recognized scenic roads or corridors.

The existing visual condition is the baseline for assessing the intensity and significance of visual impacts and is addressed only relative to critical public views which include:

- Views that are readily available to the public.
- Views for which there are indications the public would be concerned if they were to be adversely affected.
- Views within which a proposed action would be substantially visible.

A brief summary of the critical public views is provided below. For a more detailed description, please refer to the Aesthetics/Visual Resources Impact Assessment document included in the Combined Technical Reports document.

Critical Public Views

Public views of the proposed project are few in number, these mostly being from the nearby roads and State Route 58. Field observations confirmed that only two of the five project segments would be within sensitive public views as follows:

- Walong-to-Marcel: A short stretch of the Walong-to-Marcel segment would be seen from a turnout along Woodford-Tehachapi Road near the Tehachapi Loop.

- Caliente-to-Bealville: Two stretches of the Caliente-to-Bealville segment are within sensitive public reviews. One would be seen from points at and near the rural residential area at Caliente. The other stretch is in the vicinity of Tunnel 2 and would be visible from a turnout along Caliente Bodfish Road and nearby vantage points popular with rail enthusiasts, otherwise known as "railfans" (Tunnel 2).

Given their sensitivity and exposure to project features, the points from which these views are available are treated as critical viewing positions and are discussed below.

Walong-to-Marcel

For this 1.01-mile segment, the most visible part of the double-track alignment would be where the new track bypasses Tunnel 10 through a graded slot about 40-50 feet north of the existing track centerline. The bypass would be within view from a turnout along Tehachapi-Woodford Road that is about 1,200 feet away. The Tehachapi Loop is on the far side of the hill through which Tunnel 10 passes.

Portions of the new double-track on both sides of the tunnel would be visible from two more viewing positions near Tunnel 10.

Several turnouts along Tehachapi-Woodford Road have public monuments that explain the engineering that went into creating the Tehachapi Loop. Given that the Tehachapi Loop area is an important attraction for sightseers and railfans, views from Woodford-Tehachapi Road, its several turnouts, and the over-tunnel positions are deemed to be highly sensitive. Because certain project features would be in the foreground of views from the three viewing positions noted, they are treated as critical public views.

Caliente–to-Bealville

Three viewing positions were selected to represent points in this segment from which project would be visible. Within view near Caliente would be two major fill slopes supporting the proposed new tracks. Views from various groups of rural homes are treated as moderately sensitive, as are views from roads serving as the main access to these homes. Field assessments concluded that new engineered slopes along the north side of the existing tracks southwest of Caliente would be highly visible within these three representative public views. Therefore, given their sensitivity and the project's exposure in these views, they are considered to be critical public views.

In the vicinity of Tunnel 2, railfans view trains approaching from the east as well as from the south through the tunnel from a turnout along Caliente Bodfish Road. The new track would bypass the tunnel through a graded slot about 67 feet west of the tunnel.

In addition, a well-used path leads down the slope on the south side of the ridge above Tunnel 2. This path ends at a vantage point west of the south portal. Apart from the path noted, a dirt road leading from Caliente Bodfish Road to the hilltop area above the tunnel provides vehicular access to the hilltop above the tunnel for railfans. Views to the southeast and northeast from that vantage point would include the proposed double-track on both sides of the tunnel.

These three viewing positions are considered to be highly sensitive due to the recreation activity they support. The proposed double-track north and south of the tunnel and the tunnel bypass would be in the foreground of these views. Given the sensitivity of the views and the proximity and visibility of project features, these are considered to be critical public views.

Existing Visual Conditions within Critical Public Views

Visual Character

As noted above, public viewing positions for this assessment are located along or near the Walong-to-Marcel and Caliente-to-Bealville segments. The landscape setting for these two segments is rural/agricultural framed within a larger natural-appearing landscape dominated by the Tehachapi Mountains.

Several types of cultural features are inherent to this character type including the BNSF/UPRR railroad built in the late 1800s and the railroad towns that sprang up along the rail line during its early years. The railroads are the most memorable features within the Tehachapi Pass area. Features associated with the development of the railroad are treated as inherent to the landscape and include tunnels, cut and fill slopes, sidings, as well as the towns.

Neither of these segments have visibly inconsistent alterations of landforms (excessive grading and filling). Features in view from the identified critical public views are similar, consistent, and agree with the character of the region. There is readily available access to unobstructed views of the Tehachapi Loop and the many parts of the Walong-to-Marcel and Caliente-to-Bealville segments.

Light and Glare

Except for groups of rural homes at Keene and Caliente, rural residences in the region are mostly well separated. Few businesses (restaurant, post office) are located within these communities. In addition, isolated ranch structures and the National Chavez Center are located at Keene. Therefore, sources of night lighting are limited.

A source of potential light and glare is the set of lights on the front of the train locomotives. Glare would occur on any sensitive receptor in line with the direction of the rail. Given that trains have been an expected part of the landscape for over 130 years, the occasional sweep of lights across the Caliente residences from the passing locomotives is an inherent part of character of the nighttime lighting and glare for project area. The daytime operation of locomotives, which operate with all sets of lights on all the time, do not produce glare during daylight hours.

Environmental Consequences

Build Alternative

Construction Impacts

Construction of the additional track would require cutting and filling slopes, adding or expanding bridges, and adding or expanding existing culverts. No tunnels would be removed as part of this project. Visual impacts during construction would include the temporary presence and movement of a workforce and heavy equipment, as well as laydown areas for supplies and materials. Project construction activities would occur solely during daylight hours. Therefore, there would be no potential for nighttime light and glare impacts due to construction activities.

Construction is proposed in five separate phases; visual impacts would be limited to the area of one specific segment at a time, as identified in the project construction schedule.

Walong-to-Marcel

During construction, the project would not diminish the extent to which any scenic vista would be visible to the public, but would temporarily interfere with public access to some currently available viewing positions. Clearing, grubbing, and excavation for the graded slot for the tunnel bypass for the double track would result in the loss of a substantial number of oak trees that now occur on the slopes on the north side of the proposed double track. Oaks would be replaced through revegetation (see discussion in Chapter 2.3 Biological Resources).

Project construction activity may result in temporary blocking of visual access to Tunnel 10 due to the considerable grading that would be required to create the bypass around it. The intensity of activity that can be expected there, which would not occur at locations where cut and fill slopes are located, would be less.

Construction of the railroad and its operation are an historical part of the Tehachapi area. Construction activities improving the rail line are consistent with the character of the

area. In addition, the potentially affected view of Tunnel 10 is not unique. Tunnel 9 is also readily seen from the road from a number of turnouts along Woodford-Tehachapi Road, as analyzed in the Aesthetics/Visual Resources Impact Assessment document.

Caliente-to-Bealville

During construction, the project would not diminish the extent to which recognized scenic vista would be visible to the public, but would eliminate public access to one currently available viewing position. The project features most noticeable within this segment would be the fill slopes southwest of Caliente and the steep cut slopes of the Tunnel 2 bypass.

There would also be a new bridge built over Tehachapi Creek and Bealville Road at mile post 335.94. However, construction of this bridge would have no adverse effect on public views. It would be on the north side of, and parallel to, the existing tracks and be identical in configuration and dimensions to the existing bridge. Seen from the south along Bealville Road, the new bridge would not be readily apparent because it would be next to the north side of the exiting bridge and therefore behind it, relative to such viewing positions. Seen from the north, only the new bridge would be in view, the existing span being behind it to the south. The new span would be identical to the existing bridge in configuration, materials, and dimensions and would not be noticeable as a new feature.

Construction of large fill slopes southwest of Caliente would result in the loss of oak trees in that area. Revegetation is planned so that a plant community similar to what would be lost would, in time, be reestablished. Replacement oaks on a two-for-one basis on the lower part of the slopes would be planted. In time, the fill slopes would be similar to the slopes as they appear today.

The effects of the presence and movement of a workforce and equipment and temporary loss of vegetation are consistent with the history of the Tehachapi rail line and its development, its maintenance and improvement. These effects would not be considered to be an adverse impact.

During construction of the bypass at Tunnel 2, construction activities are integral to the development and function of the rail line. Clearing and grubbing would remove no trees, but construction of the tunnel bypass would eliminate all of the available access to the existing viewing positions along the ridge directly above that tunnel. The graded notch in the ridge would cut off the dirt road that currently extends to points directly over the tunnel. The ½:1 cut slopes would also prevent all but the most determined railfans from

reaching the over-tunnel position on foot. The over-tunnel vantage points would be considered inaccessible following the cutting of the slope.

The project, in effectively ending the existing access to points directly over Tunnel 2, would be an adverse impact on visual access. The views affected, however, are not protected or otherwise recognized as valued in Kern County's planning regulations. Access to points over Tunnel 2 is comparatively unimportant relative to many other viewing positions from which the rail line can be viewed and photographed. A search for web-posted photographs taken from points over Tunnel 2 identified just two, compared to 1,123 taken from other positions. The loss of access to points over Tunnel 2 would not, therefore, constitute a substantial adverse impact.

Operational Impacts

Walong-to-Marcel

Figure 2.1-8, Tunnel 10 Bypass and Simulation, shows existing conditions of the project near Tunnel 10, plus a visual simulation of the proposed bypass around Tunnel 10 through a graded slot about 40-50 feet north of the existing track centerline. There would be no revegetation of the cut slopes for the graded notch, and the simulation shows the long-term visual effects during the operational phase of the proposed project. Disturbed slopes along the new double track in the foreground, however, would be reseeded with native grasses. The net effect of building the project would be consistent with the character of the existing rail line in the Tehachapi Pass area. There would be no adverse impact to visual conditions.

Caliente-to-Bealville

During the operation phase, the revegetated fill slopes southwest of Caliente would eventually mature so that slopes would appear similar to the existing fill slopes supporting the rail line. The steep cut slopes at the Tunnel 2 bypass, however, would remain devoid of vegetation, but would be similar to other exposed bedrock cut slopes nearby and elsewhere within the Tehachapi Pass area. The effect of building the project would be consistent with the character of the existing rail line near Tunnel 2 or in the general Tehachapi Pass area. There would be no adverse impact to visual conditions.

Figure 2.1-9, Revegetation of the Caliente Fill Slopes after One or Two Growing Seasons, and Figure 2.1-10, Revegetation of the Caliente Slopes at Maturity, show visual simulations of the double track as it would be seen from a point along Caliente Bodfish

Road near the post office in Caliente, 0.80 mile away from the nearest fill slope, looking southwest. The existing visual conditions are shown in the upper images.

The simulations show the conditions one or two growing seasons after completion of construction and then later when planned revegetation of the fill slopes has matured. Initially the slopes would be barren. However, within one or two seasons, depending on rainfall, native grasses should appreciably cover the slopes. Thereafter, shrubs and oaks would gradually mature and the slopes would eventually appear similar in character to their appearance today. Given the history of the Tehachapi Rail Corridor and its development, the initial appearance of the disturbed slopes would be consistent with the recurring incidences of maintenance and improvement and would be treated as consistent with the character of the area. Once the vegetation has matured, the slopes would not be distinguishable from other fill slopes supporting the existing rail line in the project area. Therefore, the appearance of the fill slopes during the operational phase of the project would not adversely affect the quality of the views from the Caliente area.

The project would result in disturbance to other slopes at various locations along the track alignment. Disturbed slopes would be reseeded with native grasses (see discussion in Section 2.3 Biological Resources).

Figure 2.1-11, Tunnel 2 Bypass and Simulation, shows a visual simulation of the double track close to Tunnel 2, as well as the bypass around it through a graded slot about 67 feet west of the existing track centerline. Excavation for the bypass would occur in bedrock, and the slopes would be too steep to successfully reestablish topsoil. The simulation shows the long-term visual effects during the operational phase of the project: barren, steep cut slopes for the bypass, but native grass-covered cut slopes along the new double track in the foreground.

There are several similarly steep engineered slopes near Tunnel 2 where bedrock is exposed. These occur on the west side of Caliente Bodfish Road near the tunnel, as well as the cut slope along the east side of the tunnel’s south portal. The effect of the double track and bypass during the operational phase would be consistent with the character of the existing rail line and the several engineered slopes in the vicinity and elsewhere in the Tehachapi Pass area. Therefore, the new engineered slopes would not adversely affect the existing conditions, and there would be no adverse impact.

Existing

Proposed

BNSF/UPRR Mojave Subdivision Tehachapi Rail Improvement Project	July 2010	Figure 2.1-8
Tunnel 10 Bypass and Simulations		

Sources: URS Corporation - November 2009

Existing

Proposed

BNSF/UPRR Mojave Subdivision Tehachapi Rail Improvement Project	July 2010	Figure 2.1-9
Vegetation of the Caliente Slopes After One Growing Season		

Note: As seen from VP2-Cal

Sources: URS Corporation - November 2009

Existing

Proposed

BNSF/UPRR Mojave Subdivision Tehachapi Rail Improvement Project	July 2010	Figure 2.1-10
Vegetation of the Caliente Slopes Post Construction		

Note: As seen from VP2-Cal

Sources: URS Corporation - November 2009

Existing

Proposed

BNSF/UPRR Mojave Subdivision Tehachapi Rail Improvement Project	July 2010	Figure 2.1-11
Tunnel 2 Bypass and Simulation		

Sources: URS Corporation - November 2009

The project would introduce no daytime sources of objectionable lighting, but would affect nighttime lighting and glare because of more train lights. The lands in the project area are undeveloped, apart from isolated residences, ranches, the communities of Caliente and Keene, and the National Chavez Center. Therefore, few sources of night lighting occur near the project area. Sources of night lighting in most areas are limited to the set of lights on the front of locomotives as they travel along the rail line. Trains are required by law to operate with their headlights on, and these lights illuminate an area ahead of the locomotives and alongside of the tracks for the time it takes the trains to pass through the specific area. The addition of the proposed double track would increase train traffic through the Tehachapi Pass area and, therefore, the occurrence of nighttime lighting and glare.

Currently, light and glare from locomotives intermittently and variably affect the residences at Caliente. In the context of current traffic and past increases, the increase in traffic through Caliente at night from implementing the project would not be considerable, and the additional occurrences of light and glare from the passing locomotives would be few. In addition, vegetation (low-branching trees and shrubs) between the homes and advancing headlights shields most residents from such lighting and the potential for glare. One home has no intervening vegetation and may be exposed to lighting from the locomotives, but it is unoccupied. Given the small increase in night lighting from increased train traffic due to the project, and considering the context of the historical relationship of Caliente to the development and operation of the railroad, the additional nighttime light and glare due to the project would not be an adverse impact.

No-Build Alternative

Under the No-Build Alternative, the project would not be built and the existing conditions would remain unchanged. Potential impacts related to construction and operation to existing visual and aesthetic resources, as well as cumulative impacts, would not occur as a result of the No-Build Alternative.

Avoidance, Minimization, and/or Mitigation Measures

As noted in the above discussion, the impacts on aesthetics and visual resources due to implementation of the proposed project would be minor. Therefore, mitigation measures are not required.

2.1.7 Cultural Resources

Regulatory Setting

"Cultural resources" as used in this document refers to all historical and archaeological resources, regardless of significance. Laws and regulations dealing with cultural resources include:

The National Historic Preservation Act of 1966, as amended, (NHPA) sets forth national policy and procedures regarding historic properties, defined as districts, sites, buildings, structures, and objects included in or eligible for the National Register of Historic Places. Section 106 of NHPA requires federal agencies to take into account the effects of their undertakings on such properties and to allow the Advisory Council on Historic Preservation the opportunity to comment on those undertakings, following regulations issued by the Advisory Council on Historic Preservation (36 CFR 800). On January 1, 2004, a Section 106 Programmatic Agreement (PA) between the Advisory Council, FHWA, State Historic Preservation Officer (SHPO), and the Department went into effect for Department projects, both state and local, with FHWA involvement. The PA implements the Advisory Council's regulations, 36 CFR 800, streamlining the Section 106 process and delegating certain responsibilities to the Department. The FHWA's responsibilities under the PA have been assigned to the Department as part of the Surface Transportation Project Delivery Pilot Program (23 CFR 327) (July 1, 2007).

Affected Environment

A Historic Resources Compliance Report was completed in March 2009. Standard sources of information on cultural resources were consulted for the proposed project, including the following: the National Register of Historic Places, the California Register of Historical Resources, the State Office of Historic Preservation, the California Historical Landmarks, the California Points of Historical Interest, the California Inventory of Historic Resources, the State Historic Resources Commission, the Caltrans Historic Highway Bridge Inventory, and site records and reports filed at the South Central Coastal Information Center at Southern San Joaquin Valley Archeological Information Center at California State University, Bakersfield through the California Historical Resources Information System.

In addition, local historical research was done at the California Railroad Museum, Tehachapi Museum, California Department of Parks and Recreation, Kern County Library, University of California, San Diego Geisel Library, San Diego Public Library, and Kern County Resource Management Agency Planning Department.

Archaeological and architectural field surveys done in the project area in March 2008 and 2009 identified four prehistoric archaeological sites, and one historic-period resource. None of the prehistoric resources have been previously evaluated for eligibility for the California Register of Historic Resources. The historic-period property was previously identified, recorded, and evaluated as eligible for the California Register of Historic Places and as an historical resource for purposes of the California Environmental Quality Act. This site was the portion of Southern Pacific-Santa Fe Railroad between mile posts 327.85 to 330.54, 335.29 to 338.04, 343.30 to 343.64, 346.40 to 348.15, and 352.07 to 353.08.

In addition, the existing bridges at mile posts 328.21 and 330.04 have previously been evaluated by Caltrans and found not eligible.

Properties Considered Not Eligible for the California Register of Historic Resources

The historic portion of the Southern Pacific-Santa Fe Railroad is part of a much larger historic-period linear property, which ultimately crosses the 68 miles between Bakersfield and Mojave through the Tehachapi Mountain range, connecting Los Angeles to Bakersfield and eventually San Francisco. The portion of the railroad within the project area runs about 8 miles of a several-hundred-mile-long railroad line.

Major features of the railroad in the project area are the rails and crossings, grade separations and bridges, culverts, tunnels, and other related features. These features were built between 1915 and the present and occur throughout the entire Southern Pacific system and from Los Angeles to Bakersfield. In addition, four concrete tunnels in the project areas are similar to 17 tunnels found at various points throughout the larger Tehachapi Pass and Southern Pacific Railroad alignment.

Within the larger historic context of the Southern Pacific-Santa Fe Railroad alignment, the portions of the railroad within the project area would not be considered a contributing element to the potential eligibility of the entire Southern Pacific-Santa Fe Railroad or Tehachapi Pass alignment. So, the portion of the railroad within the project area would not be eligible within larger Tehachapi Pass and Southern Pacific-Santa Fe Railroad history as a contributing element to an eligible property, or individual eligibility for listing to the National Register of Historic Places, California Register of Historic Places, or as a historical resource for purposes of the California Environmental Quality Act.

Properties Considered Eligible for the Purposes of the Project

Four identified archaeological sites were not evaluated for the California Register of Historic Resources, but would be avoided during construction, including BNSF-TEMP-1 through 4 as discussed in the Archaeological Survey Report. These sites would be considered eligible for the purposes of the project, and avoidance measures would be implemented during project construction.

Environmental Consequences

Build Alternative

The project would have no impacts to known cultural resources. Four sites (BNSF-TEMP-1 through 4) have been determined to be eligible for the purposes of the project and would be avoided during construction. Additionally, it appears that there is low potential for the proposed project to affect buried archaeological resources during construction. Because the project area contains undeveloped property and four prehistoric archaeological sites have been identified, there is potential for the project to encounter prehistoric buried remains.

During the survey, no historic-period archaeological sites were identified. Historic maps were reviewed for the presence of former railroad-related structures to find the likelihood of historic-period subsurface deposits. Historic-period floods from the early 1900s to 1932 washed away and buried culverts, piers, water towers, girders and other railroad-related structures. While the proposed project does not encompass areas of known historic structures, it would be possible to encounter buried resources in secondary deposits as a result of historic flooding. With the implementation of mitigation and avoidance measures, and preparation of a detailed Cultural Resources Monitoring Plan, this project is not anticipated to affect any of the identified archaeological resources.

No-Build Alternative

Under the No-Build Alternative, construction would not occur and the existing conditions would remain unchanged. Potential impacts related to cultural resources would not occur as a result of the No-Build Alternative.

Avoidance, Minimization, and/or Mitigation Measures

Minimization Measures

The following avoidance measures would reduce the potential to affect unknown buried cultural resources:

- The boundaries of known archaeological sites, identified during the Phase I Archaeological Survey (BNSF-TEMP-1 through 4), shall be identified by the project archaeologists before grading activities through wooden staking and fluorescent flagging tape so that these areas may easily be avoided during construction.

Mitigation Measures

The project area contains four pre historic archaeological sites. There is potential for the project to affect known prehistoric archaeological resources within the project area. Therefore, implementation of the following mitigation measures would reduce potential impacts.

- A Cultural Resources Monitoring Plan, specifying the potential for types of resources and sites that may be encountered, shall be prepared by BNSF Railway and submitted to Caltrans for review and approval before monitoring. The implementation of the monitoring plan would help ensure rapid in-field evaluation and documentation to prevent construction hold-ups. If any prehistoric or historic cultural resources (chipped or ground stone lithics, animal bone, ashy midden soil, structural remains, historic glass or ceramics, etc.) are discovered during the course of construction, all work in the vicinity shall halt, and the archaeologist would evaluate the significance of the find, and if significant, identify the proper course for mitigation.
- BNSF Railway shall retain the services of an archaeological monitor to be present during all ground-disturbing activities to ensure that impacts to cultural resources are avoided. Additional archaeological monitors may be required by Caltrans in certain areas where there is greater sensitivity to encounter resources. Additional monitors may include Native American monitors and/or additional archaeological personnel. Additional archaeological monitors shall be used on an as-needed basis and in conjunction with coordination efforts with Caltrans.
- If human remains are encountered, BNSF Railway shall cease all construction in the area of the find and the remains would stay in-situ pending definition of an appropriate plan. State Health and Safety Code Section 7050.5 states that further disturbances and activities shall cease in any area or nearby area suspected to overlie remains, and the Kern County Coroner shall be contacted. Pursuant to Public Resources Code Section 5097.98, if the remains are Native American in origin, the Native American Heritage Commission would be contacted to determine necessary procedures for protection and preservation of the remains, including identifying the Most Likely Descendent for reburial, as provided in the State of California

Environmental Quality Act Guidelines, Section 15064.5(e), "CEQA and Archaeological Resources," CEQA Technical Advisory Series. The Caltrans District 6 Environmental Branch shall also be contacted so that staff may work with the Most Likely Descendent on the respectful treatment and disposition of the remains. Further provisions of Public Resources Code Section 5097.98 are to be followed as applicable.

While the prehistoric sites have been recorded within the Area of Potential Impact but are outside the directly affected areas, they are lacking associated surface artifacts. BNSF Railway shall conduct an Extended Phase 1 survey using shovel test pits in a plan approved by Caltrans, or use additional archaeological monitors during project grading phases to ensure potential surface artifacts on all directly affected areas are properly handled.

If artifacts are noted, BNSF Railway would determine the extent of the artifactual deposits. Also, the artifacts would be counted, described, and returned to the shovel test pits. BNSF Railway would coordinate with Caltrans representatives to identify and discuss optional approaches to the issue.

If no artifacts are noted, the California Environmental Quality Act analysis would assume the site eligible for listing in the California Register of Historic Resources and identify monitoring and other mitigation measures to protect the site during construction and ensure any unanticipated discoveries are evaluated and treated in accordance with all regulatory requirements.

2.2 Physical Environment

2.2.1 Hydrology and Floodplain

Affected Environment

The environmental setting includes the local drainage and regional hydrology. Detailed information is available in the Hydrology, Hydraulics, and Water Quality Technical Report prepared for the project and included with the Combined Technical Reports document of this Mitigated Negative Declaration.

The overall project is made up of five construction areas along the railway alignment. The project "study area" is the proposed physical ground disturbance footprint. This

footprint is located within the southern portion of the Regional Water Quality Control Board's Central Valley Region Basin Plan, within the Middle Kern-Upper Tehachapi-Grapevine and Tulare-Buena Vista Lakes Watersheds (see Figure 2.2-1, Central Valley Regional Watersheds). The study area is within the jurisdictions of the Regional Water Quality Control Board and the California Department of Fish and Game.

The Tulare-Buena Vista Lakes Watershed encompasses 1,391 square miles and the two western downslope project segments (Caliente-to-Bealville and Bena-to-Ilmon), which are within the South Valley Floor Hydrologic Unit. The Middle Kern-Upper Tehachapi-Grapevine Watershed encompasses 1,310 square miles and contains the three eastern, upslope segments of the study area (Walong-to-Marcel, Rowen-to-Woodford, and Cliff Siding Extension), which are within the Grapevine Hydrologic Unit.

Three intermittent creeks parallel and occasionally pass through the study area at various mile post locations. Tweedy Creek, Tehachapi Creek, and Caliente Creek are part of the Tehachapi Hydrologic Area, which drains a 290,099-acre watershed. Tweedy Creek, a small ephemeral tributary to Tehachapi Creek, is parallel to the project for about 1.3 miles within the Rowen-to-Woodford segment. The overall Caliente Creek Watershed consists of approximately 470 square miles. The Tehachapi Creek joins Caliente Creek downstream near the town of Caliente. Caliente Creek generally flows west and parallels the project for about 8.8 miles within the lower elevation segments of Caliente-to-Bealville and Bena-to-Ilmon. Detailed information is available in the Hydrology, Hydraulics, and Water Quality Technical Report prepared for the project (included in the Combined Technical Studies document).

Caliente Creek is generally dry at the lower points, but it does flood on rare occasions when the creek reaches the city of Lamont (about 11 miles west of the study area). The Bena 7.5-minute U.S. Geological Survey quadrangle map shows Caliente Creek as an intermittent blue line feature as it courses downslope to within the last 2 miles of the Bena-to-Ilmon segment, where it is then mapped as an ephemeral wash. The downslope change from intermittent stream to ephemeral wash further shows Caliente Creek's intermittent and ephemeral hydrology as it reaches the valley floor.

The Federal Emergency Management Agency 100-Year Floodplain intersects the Rowen-to-Woodford, Caliente-to-Bealville, and Bena-to-Ilmon project segments, whereas the Woodford-to-Marcel and Cliff Siding Extension occur outside the 100-year floodplain. The 100-year floodplain generally increases in size within the western, downslope portion of the study area.

There are 55 water resource features, including seven water crossings that pass through the study area. Of these seven, only three larger water crossings would be affected from project bridge and embankment re-constructions. The modeling analysis for each of these crossings for the 50-year and 100-year storm events is included in the Hydrology, Hydraulics, and Water Quality Technical Report prepared for the project. Brief descriptions of these three drainages are presented below:

Caliente Bodfish Crossing (Mile Post 335.56)

The results of the modeling analysis for both the existing and proposed conditions indicate that the bridge would be inundated during the 50-year and 100-year storm events. As a high level of sedimentation has already accumulated, the opening area under the bridge has been reduced over the years, causing the potential for flooding. The modeling results for both pre- and post-conditions predicts that flooding during both 50-year and 100-year storm events is likely. Lengthening the existing bridge to 240 feet and adding and raising the new bridge by approximately 4 feet would mitigate the flooding situation.

The analysis also indicated that lengthening and raising the bridge alone is not enough to allow both the 50-year and 100-year storm events through the channel at the bridge. Therefore, dredging the channel was evaluated to accommodate both the 50-year and 100-year flood events. For this scenario, the water surface elevation for the proposed bridge decreased by 12 feet for the 50-year and 9 feet for 100-year storm event when the channel is dredged. To avoid overtopping during the 100-year storm events, it is recommended that, along with raising and lengthening the bridge, the channel be dredged by15 feet.

The Caliente Bodfish Road Bridge is downstream of the railroad bridge. The analysis indicated there is no significant impact on the downstream Caliente Bodfish Road Bridge. The water surface elevation at Caliente Bodfish Road Bridge increased by about 0.25 foot for a 50-year storm event and by 0.34 foot for a 100-year storm event (at the cross-section just upstream of the bridge).

Caliente-to-Bealville Creek (Mile Post 330.04)

The analysis for both the existing and proposed conditions has confirmed there would be a negligible change in the floodplain boundary following construction of the proposed bridge at Mile Post 330.04.

Topographic assumptions were made for modeling at this location due to the limitations of the topographic data.

While the location of the proposed bridge is within an area that has been dredged extensively to manage sedimentation, the Hydrology and Water Quality Technical Report indicates that the proposed floodplain boundary should only be minimally affected at this location. Following project construction, the water surface elevation was estimated to increase by about 0.07 foot during the 50-year storm event and 0.22 foot during the 100-year storm event.

Bena-to-Ilmon (Mile Post 328.21)

The existing condition analysis indicates the presence of a pre-existing hydraulic constraint at this site due to the severe increase in elevation due to depositing of sediment that has occurred over the last several years. Project research indicated that the railroad and Bena Road bridges were originally built in the floodplain and this restriction causes a limiting effect in the amount of flow that can pass through this section of the channel under existing conditions.

Because the proposed track is not the limiting condition for this location, the existing mainline Bridge 328.21 and the existing Bena Road Bridge both were analyzed in the Hydrology, Hydraulics, and Water Quality Technical Report prepared for the project.

The analysis recommended that both existing bridges should be raised by 4.5 feet and lengthened by 300 feet. This would reduce the obstruction in the natural flow of the stream, thus minimizing the effect of sediment deposition, and protect from future rail service outages and use of Bena Road during 50- and 100-year storm events.

A discharge analysis at Bena Road Bridge was conducted using a HEC-RAS model. The Discharge Analysis compared the water surface level of current conditions and future conditions as a result of the project. The discharge analysis showed that there is no change between the 50-year and the 100-year water surface analysis. As a result the proposed project would not increase the floodplain boundaries. Therefore, the raising of the new track by 4.5 feet and increasing the length to 360 feet in between the existing railroad bridge and the Bena Road Bridge does not change the existing hydraulic constraints at this location. No change is recommended for the existing bridge and the Bena Road Bridge within this rail segment.

Environmental Consequences

Build Alternative

Construction Impact

Potential impacts from the Build Alternative would occur mainly during construction. Grading activities would include embankment fills and slope cuts. Drainage flows would be affected mainly during grading. During a heavy rain, the project could be affected by floodwaters. Construction of the new bridges would cause temporary significant impact to the hydrology and hydraulics of the three major drainages at mile posts 328.21, 330.04, and 335.56. However, project activity would not result in major alteration to the water surface elevation level nor would it significantly change the floodplain boundary. The hydraulic conditions would not deteriorate following construction of the proposed bridge.

Operational Impact

Because railroad activity exists along the entire project alignment, additional rail traffic and operations would not cause more impacts to the project study area. Active sediment deposition is an ongoing process at the Caliente Basin and would continue to be an ongoing process with or without the project. The project would result in only a negligible amount of changes in water service level and floodplain boundary. Consequently, the existing operational conditions at the railroad bridges, including flooding for the 50-year and 100-year storm events, would be similar in the post-condition.

No-Build Alternative

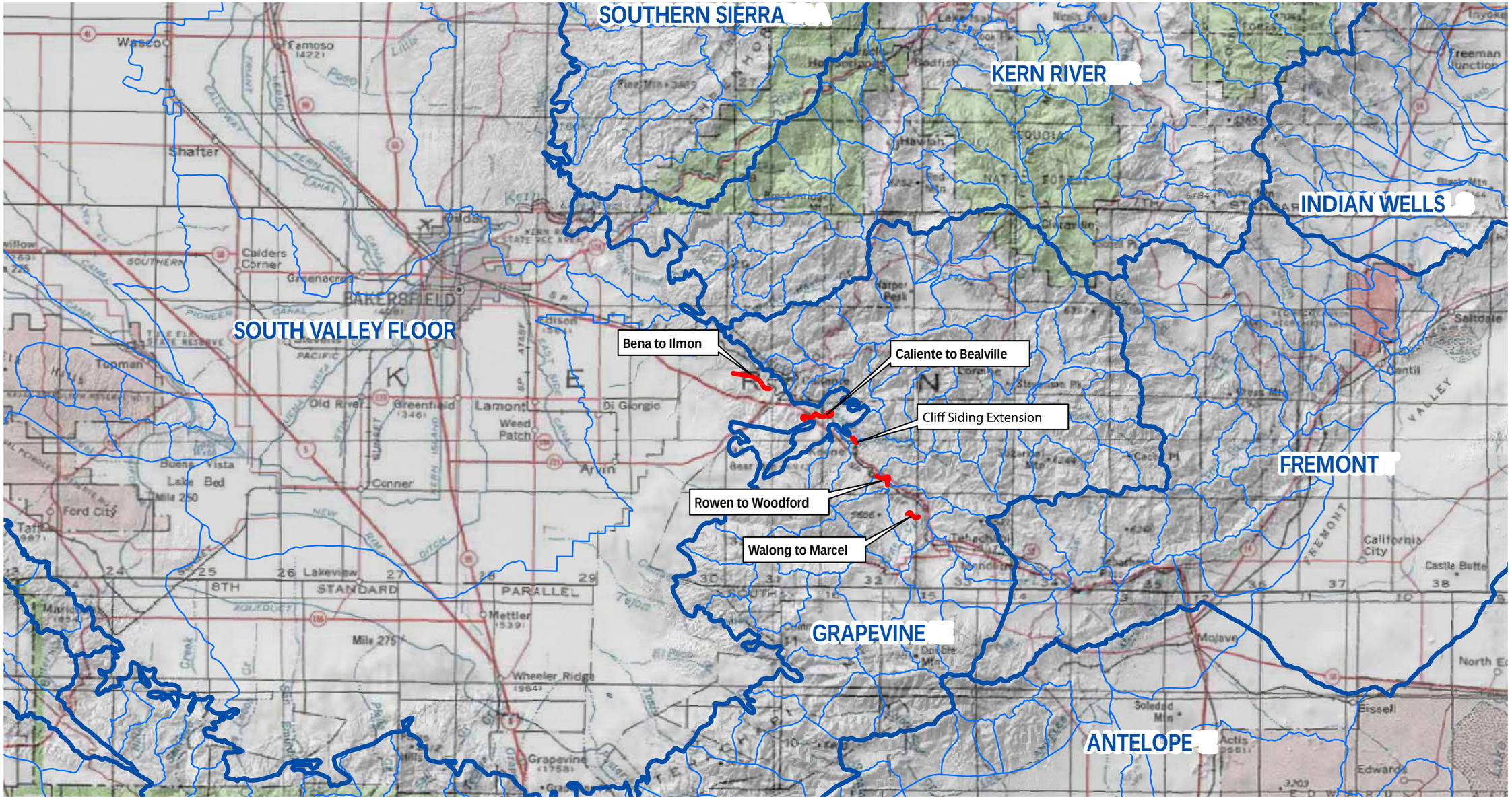
Under the No-Build Alternative, the proposed project would not be built and the existing conditions would remain unchanged. There would be no construction, operational, or cumulative impacts from the No-Build Alternative.

Avoidance, Minimization, and/or Mitigation Measures

Minimization Measures

To minimize impacts from the project, BNSF Railway shall implement the following:

- During construction, work within or over the floodways shall be scheduled by BNSF Railway to occur during the non-rainy season. Minor impacts to sediment buildup would occur during construction of the project. Measures would involve energy dissipation devices and best management practices to minimize sedimentation buildup and erosion.



Legend

- Proposed Double Track Extension
- Hydrologic Unit
- Hydrologic Sub-Area

0 8 16 Miles

BNSF/UPRR Mojave Subdivision Tehachapi Rail Improvement Project

Central Valley Regional Watersheds

July 2010	Figure 2.2-1

Sources: USGS California Map Series,
1:500,000 California Map Series, Santa Ana, 1981

- Before construction, re-analysis of impacts to hydrologic flows should be prepared based on final bridge design and topographic conditions.
- A Letter of Map Revision (LOMR) application would need to be completed with Federal Emergency Management Agency to address the changes in flood elevation level on mile post 328.21. The boundaries of the affected area would be determined pending final design verifications.

2.2.2 Water Quality

Regulatory Setting

Federal Requirements: Clean Water Act

In 1972, the Federal Water Pollution Control Act was amended, making the discharge of pollutants to the waters of the United States from any point source unlawful, unless the discharge is in compliance with a National Pollutant Discharge Elimination System (NPDES) permit. The Federal Water Pollution Control Act was subsequently amended in 1977, and was renamed the Clean Water Act. The Clean Water Act, as amended in 1987, directed that storm water discharges are point source discharges. The 1987 Clean Water Act amendment established a framework for regulating municipal and industrial storm water discharges under the National Pollutant Discharge Elimination System program. Important Clean Water Act sections are as follows:

- Sections 303 and 304 provide for water quality standards, criteria, and guidelines.
- Section 401 requires an applicant for any federal project that proposes an activity, which may result in a discharge to waters of the United States to obtain certification from the State that the discharge will comply with other provisions of the act.
- Section 402 establishes the National Pollutant Discharge Elimination System, a permitting system for the discharges (except for dredge or fill material) into waters of the United States. Regional Water Quality Control Boards (RWQCB) administer this permitting program in California. Section 402(p) establishes addresses storm water and non-storm water discharges.
- Section 404 establishes a permit program for the discharge of dredge or fill material into waters of the United States. This permit program is administered by the U.S. Army Corps of Engineers (ACOE).

The objective of the Clean Water Act is “to restore and maintain the chemical, physical, and biological integrity of the Nation’s waters.”

State Requirements: Porter-Cologne Water Quality Control Act (California Water Code)

California's Porter-Cologne Act, enacted in 1969, provides the legal basis for water quality regulation within California. This act requires a "Report of Waste Discharge" for any discharge of waste (liquid, solid, or otherwise) to land or surface waters that may impair beneficial uses for surface and/or groundwater of the state.

The State Water Resources Control Board and Regional Water Quality Control Boards are responsible for establishing the water quality standards (objectives) required by the Clean Water Act, and regulating discharges to ensure that the objectives are met. Details regarding water quality standards in a project area are contained in the applicable Regional Water Quality Control Boards Basin Plan. States designate beneficial uses for all water body segments, and then set criteria necessary to protect these uses. Consequently, the water quality standards developed for particular water segments are based on the designated use and vary depending on such use. In addition, each state identifies waters failing to meet standards for specific pollutants, which are state listed in accordance with Clean Water Act Section 303(d). If a state determines that waters are impaired for one or more constituents and the standards cannot be met through point source controls, the Clean Water Act requires establishing Total Maximum Daily Loads (TMDLs). TMDLs establish allowable pollutant loads from all sources (point, non-point, and natural) for a given watershed.

State Water Resources Control Board and Regional Water Quality Control Boards

The State Water Resources Control Board administers water rights, water pollution control, and water quality functions throughout the state. Regional Water Quality Control Boards are responsible for protecting beneficial uses of water resources within their regional jurisdiction using planning, permitting, and enforcement authorities to meet this responsibility.

NPDES Program

The State Water Resources Control Board adopted Caltrans Statewide National Pollutant Discharge Elimination System Permit (Order No. 99-06-DWQ) on July 15, 1999. This permit covers all Department rights-of-way, properties, facilities, and activities in the State. National Pollutant Discharge Elimination System permits establish a 5-year permitting time frame. National Pollutant Discharge Elimination System permit requirements remain active until a new permit has been adopted.

In compliance with the permit, Caltrans developed the Statewide Storm Water Management Plan (SWMP) to address storm water pollution controls related to highway planning, design, construction, and maintenance activities throughout California. The Storm Water Management Plan describes the minimum procedures and practices the Department uses to reduce pollutants in storm water and non-storm water discharges. It outlines procedures and responsibilities for protecting water quality, including the selection and implementation of best management practices. The proposed project will be programmed to follow the guidelines and procedures outlined in the 2003 Storm Water Management Plan to address storm water runoff or any subsequent Storm Water Management Plan version draft and approved.

Municipal Separate Storm Sewer System Program

The U.S. EPA defines a Municipal Separate Storm Sewer System (MS4) as any conveyance or system of conveyances (roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, human-made channels, and storm drains) owned or operated by a state, city, town, county, or other public body having jurisdiction over storm water management, that are designed or used for collecting or conveying storm water. As part of the National Pollutant Discharge Elimination System program, U.S. EPA initiated a program requiring that entities having MS4s apply to their local Regional Water Quality Control Boards for storm water discharge permits. The program proceeded through two phases. Under Phase I, the program initiated permit requirements for designated municipalities with populations of 100,000 or greater. Phase II expanded the program to municipalities with populations less than 100,000.

Construction Activity Permitting

Section H.2, Construction Program Management of Caltrans' National Pollutant Discharge Elimination System (DSA) permit states: "The Construction Management Program shall be in compliance with requirements of the National Pollutant Discharge Elimination System General Permit for Construction Activities (Construction General Permit)." Construction General Permit (Order No. 2009-009-DWQ, adopted on September 2, 2009, will become effective on July 1, 2010. The permit will regulate storm water discharges from construction sites that result in a DSA of 1 acre or greater, and/or are part of a common plan of development. By law, all storm water discharges associated with construction activity where clearing, grading, and excavation results in soil disturbance of at least 1 acre must comply with the provisions of the General Construction Permit.

The newly adopted permit separates projects into Risk Levels 1 – 3. Requirements apply according to the Risk Level determined. For example, a Risk Level 3 (highest risk) project would require compulsory storm water runoff pH and turbidity monitoring. Risk levels are determined during the design phase and are based on potential erosion and transport to receiving waters. Applicants are required to develop and implement an effective Storm Water Pollution Prevention Plan (SWPPP).

Caltrans Statewide National Pollutant Discharge Elimination System Permit requires Caltrans to submit a Notice of Construction (NOC) to the Regional Water Quality Control Board to obtain coverage under the Construction General Permit. Upon project completion, a Notice of Completion of Construction (NOCC) is required to suspend coverage. This process will continue to apply to Caltrans projects until a new Caltrans Statewide National Pollutant Discharge Elimination System Permit is adopted by the State Water Resources Control Board. A Notice of Construction or equivalent form will be submitted to the Regional Water Quality Control Board at least 30 days prior to construction if the associated DSA is 1 acre or more. In accordance with the Department's Standard Specifications, a Water Pollution Control Plan (WPCP) is used for projects with DSA less than 1-acre.

During the construction phase, compliance with the permit and the Department's Standard Special Conditions requires appropriate selection and deployment of both structural and non-structural best management practices. These best management practices must achieve performance standards of Best Available Technology economically achievable/Best Conventional Pollutant Control Technology (BAT/BCT) to reduce or eliminate storm water pollution.

Affected Environment

Most land in the upper elevation segments of the study area contains steep slopes and large grades within a portion of the Tehachapi Mountains. The study area sits within the southern portion of the Regional Water Quality Control Board's Central Valley Region Basin Plan, within the Middle Kern-Upper Tehachapi-Grapevine and Tulare-Buena Vista Lakes Watersheds (see Figure 2.2-1, Central Valley Regional Watersheds).

The Middle Kern-Upper Tehachapi-Grapevine Watershed encompasses 1,310 square miles and contains the three eastern upslope segments of the study area (Walong-to-Marcel, Rowen-to-Woodford, and Cliff Siding Extension), which are in the Grapevine Hydrologic Unit. The Tulare-Buena Vista Lakes Watershed encompasses 1,391 square

miles and two western downslope project segments (Caliente to Bealville and Bena to Ilmon), which are in the South Valley Floor Hydrologic Unit.

Three intermittent creeks generally parallel and occasionally pass through the study area at various mile post locations: Tweedy Creek, Tehachapi Creek, and Caliente Creek. Tweedy, Tehachapi, and Caliente creeks are part of the Tehachapi Hydrologic Area, which drains a 290,099-acre watershed. Tweedy Creek, a small ephemeral tributary to Tehachapi Creek, flows east and parallel to the project for about 1.3 miles in the Rowen-to-Woodford segment. The overall Caliente Creek Watershed is about 470 square miles and includes tributaries of Tehachapi Creek, Blackburn Canyon, Antelope Creek, Indian Creek and upper reaches of Walker Basin Creek.

According to the U.S. Department of Agriculture soil survey, lower Caliente Creek is dry for most of the year, but on rare occasions reaches the city of Lamont (about 11 miles west of the study area) where flows flood the streets leaving deep mud deposits. The Bena 7.5-minute U.S. Geological Survey quadrangle map shows Caliente Creek as an intermittent blue line feature as it courses downslope to within the last 2 miles of the Bena-to-Ilmon segment where it is then mapped as an ephemeral wash. The downslope change from intermittent stream to ephemeral wash further indicates Caliente Creek's intermittent and ephemeral hydrology as it reaches the valley floor.

The project "study area" is defined as the area in which U.S. Army Corps of Engineers, Regional Water Quality Control Board, and California Department of Fish and Game jurisdiction was assessed and quantified. The study area includes the project's proposed physical ground disturbance footprint, in addition to relevant portions of the Middle Kern-Upper Tehachapi-Grapevine and Tulare-Buena Vista Lakes Watersheds. Twenty water features are subject to Regional Water Quality Control Board and California Department of Fish and Game jurisdiction, 14 of which would be temporarily and/or permanently affected by the project, and none are subject to Clean Water Act Section 404 jurisdiction. The study area may have Waters of State locations as defined by the State Water Resources Control Board (State Water Resources Control Board 2004), which would require Clean Water Act Section 401 Permit certification and implementation.

Water Quality Assessments and Water Quality Objectives

To determine the water quality thresholds for the project, the Central Valley Regional Water Quality Control Board Tulare Lake Basin Plan was reviewed. According to this Basin Plan, the project is within the Grapevine and South Valley Floor Hydrologic

Subunits (56 and 57, respectively). Specific hydrologic areas are Tehachapi Creek (56.10) and Arvin-Wheeler Ridge (57.30).

There are no listed water quality assessments for the project-affected surface water bodies by the U.S. Environmental Protection Agency or State Water Resources Control Board. Based on the Central Valley Regional Water Quality Control Board Basin Plan, the Caliente and Tehachapi Creeks' beneficial uses include municipal, agricultural, recreation-water contact and non-contact, commercial, warm and cold habitat and wildlife. Beneficial groundwater uses are designated in a similar manner as surface water criteria. Water quality objectives are not set for the listed groundwater hydrogeologic basin.

Environmental Consequences

Build Alternative

Potential impacts from the Build Alternative would occur mainly during construction. Grading activities would include embankment fills and slope cuts; sediment runoff is the expected pollutant from grading activities. Potential pollutants include oil and grease from equipment, and trash and debris (floatables) from general activities and accidental spills.

Construction Impact

Potential impacts from the Build Alternative would occur primarily during construction. Grading activities would include embankment fills and slope cuts; sediment runoff is the expected pollutant from grading activities. Additional potential pollutants would include oil and grease from equipment, and trash and debris (floatables) from general activities and accidental spills.

Operational Impact

Railroad activity exists along the entire proposed project alignment. Any additional rail traffic and operations would not cause significant impacts to water quality.

No-Build Alternative

Under the No-Build Alternative, the project would not be built and the existing conditions would remain unchanged. There would be no construction, operational, or cumulative impacts as a result of the No-Build Alternative.

Avoidance, Minimization, and/or Mitigation Measures

As noted above, potential impacts from the Build Alternative would occur mainly during construction. To reduce construction impacts, BNSF Railway shall implement the following measures:

Minimization Measures

The following minimization measures should be incorporated to ensure compliance with best management practices:

- Grading and construction plans submitted by BNSF Railway shall meet requirements of the State Water Resources Control Board National Pollutant Discharge Elimination System Statewide General Permit for Storm Water Discharges Associated with Construction Activity Permit (currently Water Quality Order 99-08-WQ; as of July 2010: Order No. 2009-0009-DWQ (National Pollutant Discharge Elimination System No CAS000002-revised September 2009). Review and approval of grading and construction plans shall be the responsibility of Caltrans and the County of Kern Public Works and Building Departments.
- BNSF Railway shall submit for review and approval to Caltrans and the County of Kern Public Works Department a construction Stormwater Pollution Prevention Plan for the entire project. The Stormwater Pollution Prevention Plan shall be implemented throughout the duration of the project (currently Water Quality Order 99-08-WQ; as of July 2010: Order No. 2009-0009-DWQ (National Pollutant Discharge Elimination System No CAS000002-revised September 2009).

2.2.3 Geology/Soils/Seismic/Topography

Regulatory Setting

For geologic and topographic features, the key federal law is the Historic Sites Act of 1935, which establishes a national registry of natural landmarks and protects “outstanding examples of major geological features.” Topographic and geologic features are also protected under the California Environmental Quality Act.

This section also discusses geology, soils, and seismic concerns as they relate to public safety and project design. Earthquakes are prime considerations in the design and retrofit of structures. The Department’s Office of Earthquake Engineering is responsible for assessing the seismic hazard for Department projects. The current policy is to use the anticipated Maximum Credible Earthquake (MCE), from young faults in and near

California. The MCE is defined as the largest earthquake that can be expected to occur on a fault over a particular period of time.

Affected Environment

Geologic Setting

The project lies in the Tehachapi Mountains in the southern portion of the Sierra Nevada Geomorphic Province. In the project vicinity, a dip-slip fault, the White Wolf Fault, marks the southern boundary between the Central Valley and Sierra Nevada provinces. Elevations in this area range from about 900 feet above mean sea level at mile post 327.85 to 2,800 feet at mile post 353.08. These elevations correspond to the northwestern (Bena-to-Ilmon) and southeastern-most (Walong-to-Marcel) site segments, respectively, and are characterized by stream valleys with steep slopes and ridges.

Bena-to-Ilmon

Three formations of consolidated sedimentary rocks exist below this segment. From oldest to youngest, they include the Pliocene to Pleistocene Kern River Gravel, the Miocene Bena Gravel, and the Oligocene Walker Formation. The Kern River Gravel consists of cobbles, pebbles, sand, and silt; the Bena Gravel consists of pebbly granitic sand and gravel; and the Walker Formation consists of granitic sandstone, conglomerate, siltstone, and tuff breccia. These formations strike northwest to west-northwest, dip southwest from 20 to 30 degrees, and either surround or underlie limited areas with either igneous rock or unconsolidated sediments. The igneous rock is the Miocene-age Ilmon andesite, which lies about 2,500 feet south of the Caliente Creek; the unconsolidated sediments are the Holocene Alluvium, which underlie this creek.

Ilmon-to-Caliente

Underlying this segment are two formations. From youngest to oldest, they consist of Miocene Bena gravel overlying the Bealville fanglomerate. The Bena gravel is described in the preceding paragraph. The Bealville fanglomerate consists largely of unsorted granitic boulder debris. This formation strikes west-northwest and dips 22 to 45 degrees south-southwest.

Underlying these sedimentary rocks is Mesozoic diorite. Starting at mile post 327.85, the mineralogy of this rock type is biotite-quartz, but it changes to biotite-hornblende-quartz at about mile post 335.29. This mineralogy continues until about 347.275, where it becomes hornblende-biotite-quartz, in which the foliation is vertical to steeply dipping (about 60 to 80 degrees).

This rock type predominates beneath the remainder of the track alignment, except for two areas. In the general vicinity of Walong (mile post 352.07), a thin veneer of Quaternary alluvium overlies the diorite. In this same vicinity, the tracks cross a small area of quartz diorite.

Field Observations

To supplement the information summarized above, field observations were performed to view geologic conditions in each site segment. A summary of these observations is presented in Table 2.2-1.

Historical Seismicity

The sediments and rocks (consolidated sedimentary and igneous materials) lie in a tectonically active area with a high rate of seismicity. Major seismic zones in the immediate project area include the Garlock Fault Zone, between the Sierra Nevada and Mojave Geomorphic Provinces, and the White Wolf Fault, locally separating the Sierra Nevada Geomorphic Province from the Central Valley Geomorphic Province (see Figure 2.2-2, Project Area Soil Resources).

The White Wolf Fault is one of two that cross the railroad tracks where the project sits. The White Wolf Fault crosses just west of mile post 343.3, where it divides the Bealville fanglomerate on the northwest and diorite on the southeast, which is the upthrown side of the fault. Near mile post 338.04, the Edison is the second fault crossing the railroad tracks. It is a dip slip fault, which borders gabbro diorite on the south and the Bealville fanglomerate on the north, which is the downthrown side of the fault.

This area also contains other less extensive faults. An unnamed fault strikes northwest, about 1 mile south of the Bena-to-Ilmon segment. The Baker Fault strikes northwest about ½ mile north of the Ilmon-to-Caliente segment. A branch of the White Wolf, south of its crossing at mile post 343.3, strikes northeast, parallel to (and about 2 ½ to 5 miles southwest of), the two southernmost site segments. Finally, an inferred fault, striking northwest, reportedly adjoins the Walong to Marcel site segment. Figure 2.2-3, Earthquake Fault Zones, shows a map of faults in the site area.

Geologic Hazards

Fault Rupture

The faults pose a potential for fault rupture beneath the site area and vicinity. Based on geologic references, the White Wolf Fault and Garlock Fault have been zoned as active Earthquake Fault Hazard Zones by the State of California's Alquist-Priolo Act.

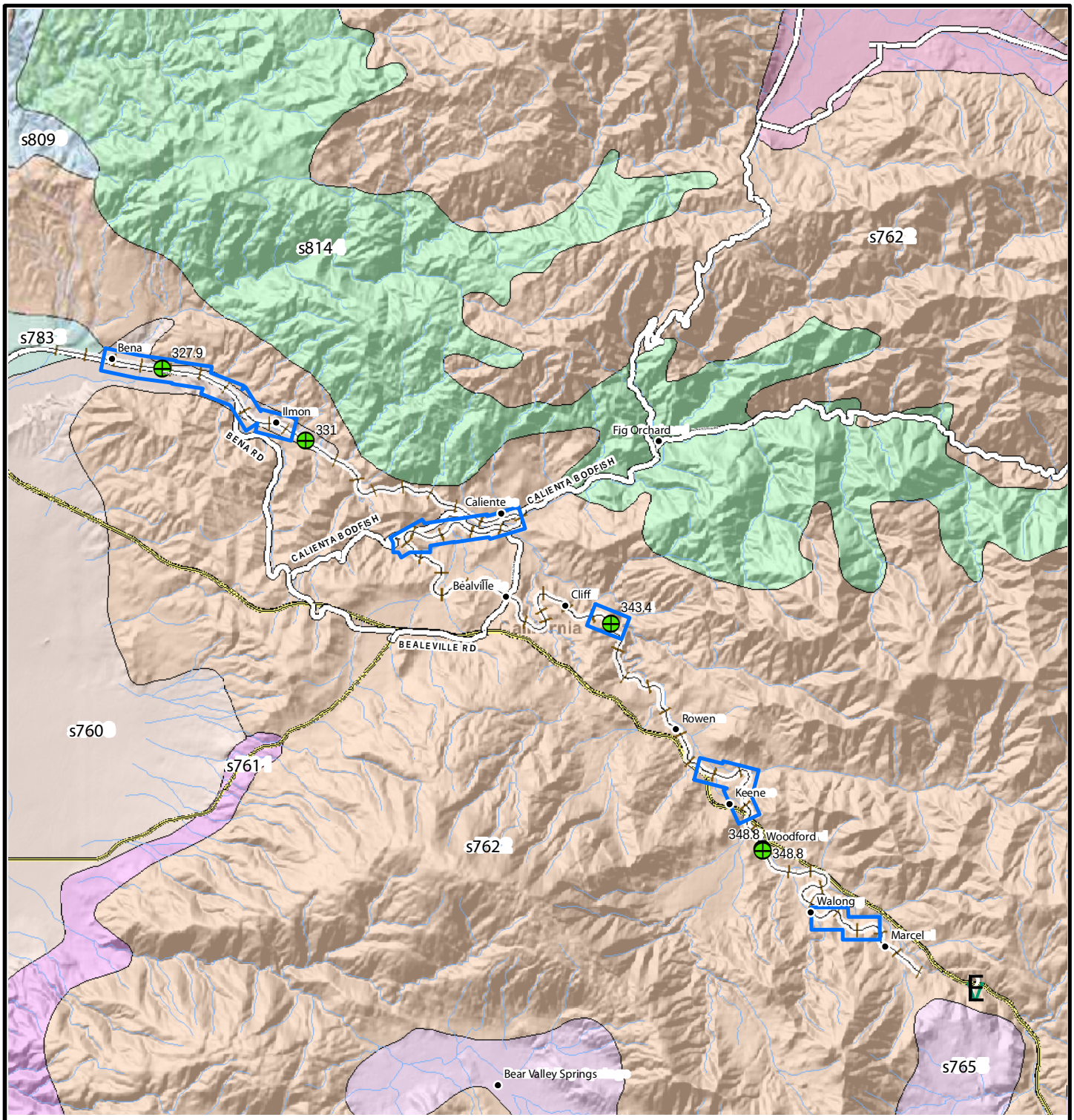
Secondary and tertiary strands of the White Wolf Fault and Garlock Fault would also be part of these hazard zones. The Edison Fault is not classified as active under Alquist-Priolo.

Ground Shaking

There is a potential for significant ground motions to be felt within the project area, given the location within a seismically active region. Two faults in the site vicinity with the greatest potential to cause ground motions include the White Wolf Fault and the Garlock Fault.

Table 2.2-1 Geologic Conditions – Summary of Field Observations

Segment Name	Milepost Numbers	Observations
Bena to Ilmon	327.85 to 330.54	This site section lies within a relatively large alluvium-filled valley surrounded by mountains consisting mostly of sedimentary rock. At the western-most road cut in this section, the rock consisted of well to moderately-well bedded sandy mudstone with abundant cobbles and boulders, which appeared consistent for the entire site segment.
Caliente to Bealville	338.04 to 335.29	This site section lies within a relatively large, flat valley containing mostly of Quaternary alluvium with some older alluvium, debris flow, and sedimentary rock. Debris flows were seen at several locations. One of these is near mile post 335.56, where field staff saw a debris/mud flow with some erosion and "float" at its toe. Near mile post 336.55, a volcanic ash/mud flow produced a scour in the alluvial material. At about mile post 336.54 was a mud/debris flow containing some volcanic ash. Besides the rock types mentioned above, field staff checked the slopes for evidence of stability. At about mile post 336.99, soils at the ridge, above the tracks, appeared relatively soft with a moderate erosion potential. Gullies and rills were visible on slopes (above and below the tracks) up to 2,600 feet west of mile post 336.99.
Cliff Siding Extension	343.3 to 343.64	Tonalite is the predominant lithology of this section (note, in some references tonalite is used synonymously to quartz diorite, although current International Union of the Geological Sciences classification defines tonalite as having greater than 20% quartz and quartz diorite with from 5% to 20% quartz). At mile post 343.64 near Tunnel No. 7, this rock type was mildly altered, having some foliation and quartz-filled veins. The slopes exposing the tonalite appeared to be steep (70° to 90°), stable, and undergoing moderate soil development. Erosional scours were also seen on the slope just below the tracks.
Rowen to Woodford	346.4 to 348.15	From the south end of this site segment and proceeding north, the predominant lithology is tonalite with some boulder conglomerate and alluvium. A well made of 2-inch diameter PVC and labeled "MW-4" is near the south end of this segment. Some of the tonalite was moderately fractured and weathered, which appeared speroidal in scattered outcrops. In a cut slope at mile post 346.71, the tonalite was heavily weathered with extensive soil development. In another cut slope at mile post 346.4, the tonalite was only moderately fractured and weathered. At mile posts 347.00 and 347.16, the tonalite existed of boulders comprising the conglomerate. The alluvium was near a bridge at mile post 347.00, where field staff also saw depressions consistent with "grinding bowls."
Walong to Marcel	352.07 to 353.08	The rock type in this section is consistent with diorite and was visible in cuts having slopes of 70° to 90°. Appearing as well-weathered granitic rock, it ranged from relatively massive to significantly fractured and contained significant muscovite on a ridge, near the tunnel occupying this site segment. One fracture contained quartz and was altered, showing evidence of shearing. The rock also showed considerable soil development, especially in one cut, and included gruss toward the southern end of this segment. Other materials in this segment included imported fill, railroad ballast, and other rock types. At mile post 352.80, the fill existed in a stockpile, which was not compacted. The ballast mainly occupied the track area, but spilled onto adjoining slopes at selected locations. The other rock type was schist near the tunnel in this segment.



Legend

- BNSF Rail Line
- Study Area Segment
- Spill Location Points (With Mile Post)

Soil Series Distribution

- s1009, Ramona-Hanford-Greenfield
- s747, Vista-Rock outcrop-Cieneba
- s760, Wasioja-Hesperia-Arvin
- s761, Walong-Tunis-Pleito-Chanac-Badland
- s762, Walong-Rock outcrop-Edmundston-Anaverde
- s763, Whitewolf-Lucerne-Cuyama
- s765, Tehachapi-Steuber-Havala
- s766, Tunis-Trigger-Torriorthents-Rock outcrop
- s782, Westhaven-Lerdo-Excelsior-Cajon
- s783, Zerker-Premier-Delano-Chanac
- s809, Torriorthents-Elkhills
- s814, Soper-Rock outcrop-Jilson-Dunnlake
- s829, Waca-Meiss

0 2 Miles

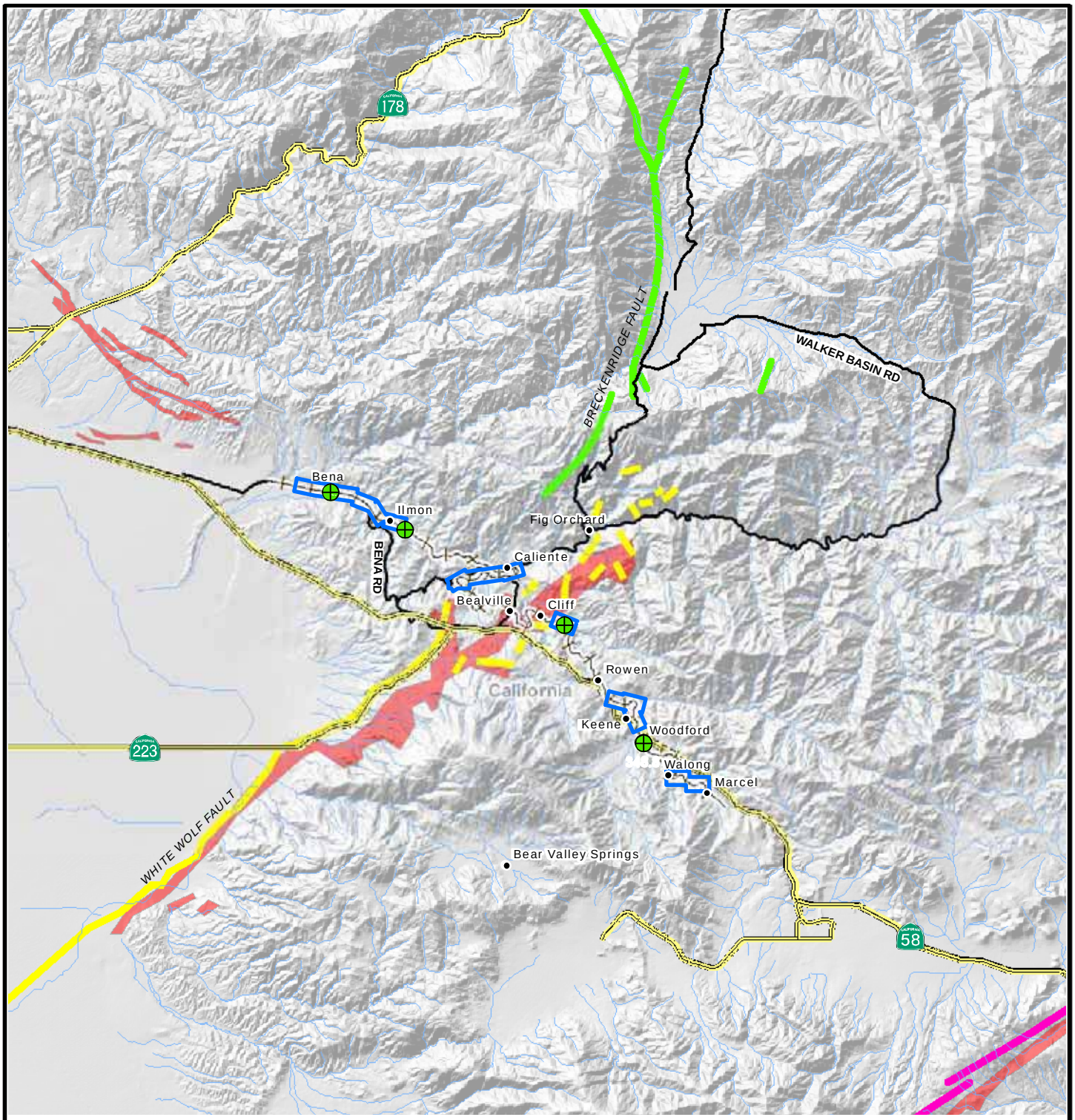
BNSF/UPRR Mojave Subdivision Tehachapi Rail Improvement Project

Project Area Soil Resources

July 2010

Figure 2.2-2

Sources: USGS Map



Legend

- BNSF Rail Line
- Study Area Segment
- Spill Location Points (With Mile Post)
- Garlock Fault
- Breckenridge Fault
- White Wolf Fault
- CA AP Zones

N

0 5 10 Mile

BNSF/UPRR Mojave Subdivision Tehachapi Rail Improvement Project

Earthquake Fault Zones

July 2010	Figure 2.2-3

Sources: USGS Map

White Wolf Fault

Trending southwest to northeast, this 40-mile-long fault is a left-lateral reverse fault variety that dips southeast. The fault extends from Wheeler Ridge to Caliente, California, and coincides with the western side of the Tehachapi Mountain Range. This fault is a significant concern for the project, given its proximity to the site segments. Once considered inactive for several years, the fault was the source of the Tehachapi Earthquake that occurred in 1952 with a magnitude of 7.3. The town of Tehachapi received considerable damage, and the ground surface was significantly disrupted in some locations. Near the northeast side of Bear Mountain, the White Wolf Fault moved vertically 2 feet and horizontally 1.5 feet.

Soil Resources

Each of the five site segments has multiple soil family associations or complexes based on a review of the Soil Survey, California U.S. Department of Agriculture (United States Department of Agriculture, 2009) (see Table 2.2-2). Soil types in the area of the track segments are as follows:

Table 2.2-2 Soil Conditions – Distribution of Soil Types

Site Segment	Mile Post Numbers	Soil Association/Complexes
Bena-to-Ilmon	327.85– 330.54	187. Trigo-Chanac association, 15 to 60 percent slopes
		209. Whitewolf loamy sand, 0 to 2 percent slopes, occasionally flooded
		217. Whitewolf-Riverwash complex, 0 to 5 percent slopes, frequently flooded
		305. Chanac-Pleito-Premier association, 20 to 60 percent slopes
		306. Xerofluvents, occasionally flooded-Riverwash complex, 0 to 5 percent slopes
Caliente-to-Bealville	335.29 - 338.04	185. Brecken-Cuyama-Pleito complex, 15 to 60 percent slopes
		261. Blasingame-Arujo-Cieneba association, 15 to 45 percent slopes
		267. Cieneba-Vista-Rock outcrop complex, 30 to 60 percent slopes
		296. Arujo-Walong-Tunis association, 30 to 75 percent slopes
		303. Steuber sandy loam, 0 to 5 percent slopes
		305. Chanac-Pleito-Premier association, 20 to 60 percent slopes
Cliff Siding Extension	343.3-343.64	194. Walong sandy loam, 30 to 50 percent slopes
		271ne. Walong-Tunis-Rock outcrop association, 30 to 60 percent slopes
		277, 277ne. Feethill-Vista-Walong association, 15 to 60 percent slopes
Rowen-to-Woodford	346.4-348.15	165. Psamments-Xerolls complex, nearly level
		193. Walong sandy loam, 15 to 30 percent slopes
Rowen-to-Woodford	346.4-348.15	195. Walong-Arujo sandy loams, 15 to 30 percent slopes
Walong-to-Marcel	352.07-353.08	195. Walong-Arujo sandy loams, 15 to 30 percent slopes
		199. Walong-Edmundston association, steep

Environmental Consequences

Build Alternative

Construction and Operational Impacts

Geologic Hazards—Fault Rupture/Ground Shaking

The impacts of earthquake-related hazards on construction and operations under the Build Alternative are considered moderate based on the analysis presented in the Preliminary Geotechnical Report included with the Combined Technical Reports document of this Mitigated Negative Declaration. Consequently, some degree of rupture is possible, especially in site segments closest to the White Wolf Fault. These segments include Caliente-to-Bealville, which is about 2 miles northwest of the fault; the Cliff Siding Extension, which borders the fault; and Rowen-to-Woodford, which is about 2.5 miles southeast of the fault.

Surface rupturing caused by movement along the White Wolf Fault or other faults could displace and distort the tracks and result in full or partial closure until repairs can be completed. Much smaller displacements are anticipated on lesser faults or splays off of the primary faults. These smaller displacements would have less potential for disruption of the rail lines given their construction on a raised surface of ballast and sub-ballast. The rail and ballast system would tend to float or bridge and accommodate small magnitude settlements and ground movements.

Since the results of a geotechnical investigation and detailed seismic design would help ensure that the embankment is built properly, the impacts of fault rupture and ground shaking during a nearby major earthquake are expected to be moderate. Potential interruption of rail operations and damage to structures that can be repaired could occur, but catastrophic structural failure or loss of life is not anticipated during these smaller displacements. The impacts from ground shaking during smaller earthquakes, as well as the impacts of other earthquake-related hazards such as liquefaction and subsidence, would have few localized impacts that could potentially cause short-term disruption of activity.

Smaller magnitude fault displacements may be wholly or partially minimized by the basic resiliency of the rail-ballast system. However, large magnitude fault displacements potentially remain to be a potential adverse impact if the White Wolf Fault system (primarily fault splays) causes ground surface shaking and/or rupture. Potential impacts could be avoided and reduced through reinforcement and of existing rail-ballast system.

Geologic Hazards—Landslides

A study of the site segments revealed no evidence of landslides having occurred in the project area. However, the study area has some susceptibility to landslides, erosion, or mass movements for the following reasons:

- The structural geology of the area results in dipping strata that can promote slip surfaces.
- Though relatively massive and with little to no distinct bedding (upon which landslides can occur), the sedimentary rock described in this section dips into the Bena-to-Ilmon and Caliente-to-Bealville site segments.
- Common faults and fractures are present. In particular, the White Wolf Fault passes along the western margin of the Cliff Siding Extension (mile posts 343.3 to 343.64). This fault passes through crystalline rocks, which may rupture, but generally have a moderate potential for landslides. Ground shaking attributable to this or other faults would have a greater potential to induce landslides in the sedimentary rocks described in this section.
- The tectonic setting suggests that high levels of ground shaking may occur.

Minimization of this hazard includes design-level geotechnical studies to evaluate the hazard and propose appropriate design measures to lessen impacts. Designs to reduce or avoid impacts from landslides or potential slope instability would be implemented during project construction.

Implementation of the minimization measures would reduce, to the extent possible, the potential for landslides through project design and use of appropriate best management practices; however, as there is no possibility to minimize for landslide-causing natural disasters (earthquakes), potential impacts for landslides would remain. Stabilizing existing landslide locations would potentially mitigate areas that would remain prone to slope failure under the No-Build Alternative. Once in operation, regular safety inspection and maintenance would help minimize impacts of slope by providing for preventive maintenance and repair to areas with slide potential. Potential interruption of rail operations and damage to structures that can be repaired potentially could occur, but catastrophic structural failure and/or loss of life is not anticipated.

The impacts of landslides are not expected to be substantial in the project area, as they would have localized impacts that could potentially cause short-term disruption of

activity. The transportation of hazardous materials by rail through the project area lends to the potential for the derailment of a train carrying these materials and its subsequent release. Impacts related to the release of hazardous materials are described in Chapter 2.2.5.

Geologic Hazards—Soil/Mineral Resources

The earthwork required to develop the site segments would include such activities as grubbing, grading, excavating, and backfilling. Earthwork would be done to provide adequate foundation conditions for the proposed route and to establish the grades of each site segment. The grading plan would incorporate civil design considerations for drainage control and flood constraints. The proposed grading would change the existing soil profiles by mixing and would alter the physical, chemical, and biological characteristics of the native soils. Clearing of any protective vegetation and subsequent soil disturbance activities would likely result in a minor short-term increase in both water usage and wind erosion rates. According to the Preliminary Geotechnical Report, the site has a relatively moderate to high potential for erosion based on the superficial soils along the route.

No permanent impacts to soil resources are expected by construction or maintenance operations associated with the Build Alternative. Appropriate construction and maintenance techniques would help minimize any potential temporary soil erosion impacts. The Build Alternative could adversely affect soils, mainly if construction activities increase soil erosion rates. The applicant would implement minimization measures to reduce erosion from a construction and operations standpoint.

No-Build Alternative

Construction and Operational Impacts

Geologic Hazards—Fault Rupture/Ground Shaking

There would be anticipated impacts of fault rupture or ground shaking on maintenance and operations under the No-Build Alternative. The existing BNSF Railway structures have been designed to withstand most earth movements; therefore, the impacts of ground shaking during a nearby major earthquake are expected to be small, in that a quake could cause potential interruption of train operations and damage to embankments and some structures that can be repaired, but not catastrophic structural failure or loss of life. The impacts of ground shaking during smaller or distant earthquakes, as well as the impacts of other earthquake-related hazards such as liquefaction, are not expected to substantially affect train operations.

Geologic Hazards—Landslides

As discussed under the Build Alternative above, the area containing the site segments has some potential for landslides based on existing geologic conditions. Even with the No-Build Alternative, there is the potential for impacts to operations due to landslides within the area. Some potential landslide areas would not be stabilized in an effort to lessen or eliminate the threat of a slide as would be done under the proposed Build Alternative. No change to existing conditions is anticipated.

Geologic Hazards—Soil/Mineral Resources

The project area's potential as a sand and gravel source is limited because of the narrow confines of the area containing the site segments and the potential for shallow groundwater in areas underlain by alluvial materials. The Bena-to-Ilmon and the Caliente-to-Bealville site segments are the only ones overlying appreciable quantities of sand and gravel. In addition, active sand and gravel mining operations are not indicated in the site vicinity. The area containing the site segments is not identified as a specific or important resource for any other mineral resource (Kern Master Environmental Assessment Resource, 2004). No change to current conditions is anticipated.

Avoidance, Minimization, and/or Mitigation Measures

Minimization Measures

To reduce the potential disruption to train operations from landslides, the project proponent would implement the following minimization measures:

- During final project design and before to project grading, BNSF Railways shall improve stability of cut slopes identified by the project geotechnical engineers with structural elements like tiebacks or soil nails.
- If a landslide should affect the rail corridor, BNSF Railway shall stabilize landslides by remedial grading or other methods, if economically feasible.

BNSF Railway shall implement the following measures to minimize erosion during construction and operations:

- Before project grading, BNSF Railway shall prepare a dust control plan and a re-vegetation plan that would incorporate:
  - Soil stabilization practices.
  - Control practices to reduce wind erosion of soil stock piles and construction areas.

- Standard construction and operation practices to minimize dust.
- Stabilization of soil in areas of disturbance by establishing appropriate vegetation using the appropriate native plant species found within the Tehachapi Mountains.

2.2.4 Paleontology

Regulatory Setting

Paleontology is the study of life in past geologic time based on fossil plants and animals. A number of federal statutes specifically address paleontological resources, their treatment, and funding for mitigation as a part of federally authorized or funded projects (e.g., Antiquities Act of 1906 [16 USC 431-433], Federal-Aid Highway Act of 1956 [23 USC 305]). Under California law, paleontological resources are protected by the California Environmental Quality Act.

Affected Environment

The project area where tracks are proposed lies within the Tehachapi Mountains that form the southern end of the Sierra Nevada geomorphic province. Available geologic maps and a pedestrian survey done in the project area indicate that there are upwards of seven geologic units in the segments where new track would be constructed. Archival research indicates that the proposed project segments lie on three U.S. Geological Survey 7.5' quadrangles: Bena, Oiler Peak, and Keene. Field surveys were done to identify and document exposed paleontological resources in the project area and determine the potential proposed construction-related impacts and their significance to these resources.

Potential Paleontological Resources by Segment

Bena-to-Ilmon (Figure 2.2-5, Cut and Fill Areas–Bena-to-Ilmon)

The following soil types are found in this segment:

- Granite and Quaternary alluvium and soils (west of mile post 328.9)
- Walker Formation (south side of tracks from mile posts 328.9 to 330 and north side of tracks from mile posts 330.1 to 330.35)
- Older alluvium (north side of tracks from mile posts 330.4 to 330.54)

Caliente-to-Bealville (Figure 2.2-6, Cut and Fill Areas – Caliente-to-Bealville)

The following soil types are found in this segment:

- Typical facies of the Bealville fanglomerate (mile posts 336.5 to 336.9)

- Quaternary soils and atypical facies of the Bealville fanglomerate (mile post 337.60 to 337.60)
- Quaternary soils (336.4 to 337.0)

Cliff Siding

The geology of the entire Cliff Siding part of the project is mapped as biotite-hornblend-quartz diorite.

Rowen-to-Woodford

The entire length is mapped as Young Quaternary alluvium and granite.

Walong-to-Marcel

A bit of the west end is mapped as Young Quaternary alluvium, but the bulk is mapped as granite.

Environmental Consequences

Build Alternative

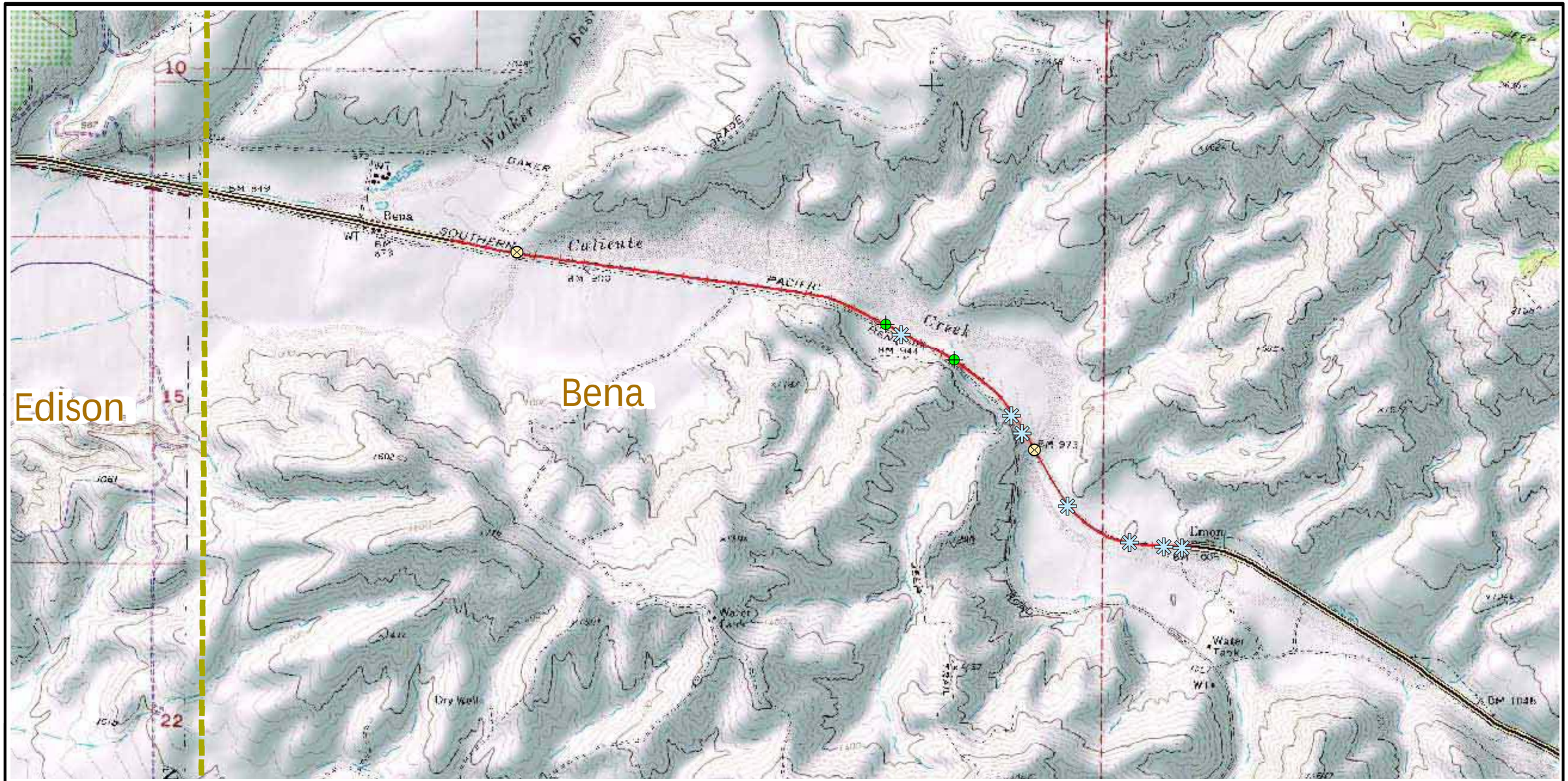
Construction and Operational Impacts

Potential paleontological impacts from construction of the proposed project were identified using current 30% engineering drawings, including cut and fill figures. Detailed information and analysis of project grading impacts to paleontological resources are provided as part of the Paleontological Identification Report included with the Combined Technical Reports document of this Mitigated Negative Declaration.

Three of the geologic units along the project segments were found sensitive for paleontological resources. Two of those, the Walker Formation and the Bealville fanglomerate, would be affected by cutting activities.

The Walker Formation is within the Bena-to-Ilmon segment. A cut of up to 15 feet deep would occur on the north side at mile post 330.35.

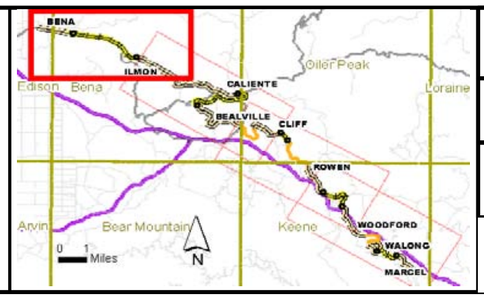
The Bealville fanglomerate is within the Caliente-to-Bealville segment. About 81,000 cubic yards of sediment would be cut from this location. The cuts would be up to 70 feet deep and 140 feet wide.



Legend

- Single Track
- Double Track
- Single Track Not in Project
- 7.5 Minute Quad Boundary
- Bridge
- Culvert (from Site Visit)
- Paleontological Survey Site

0 0.45 0.9 Miles

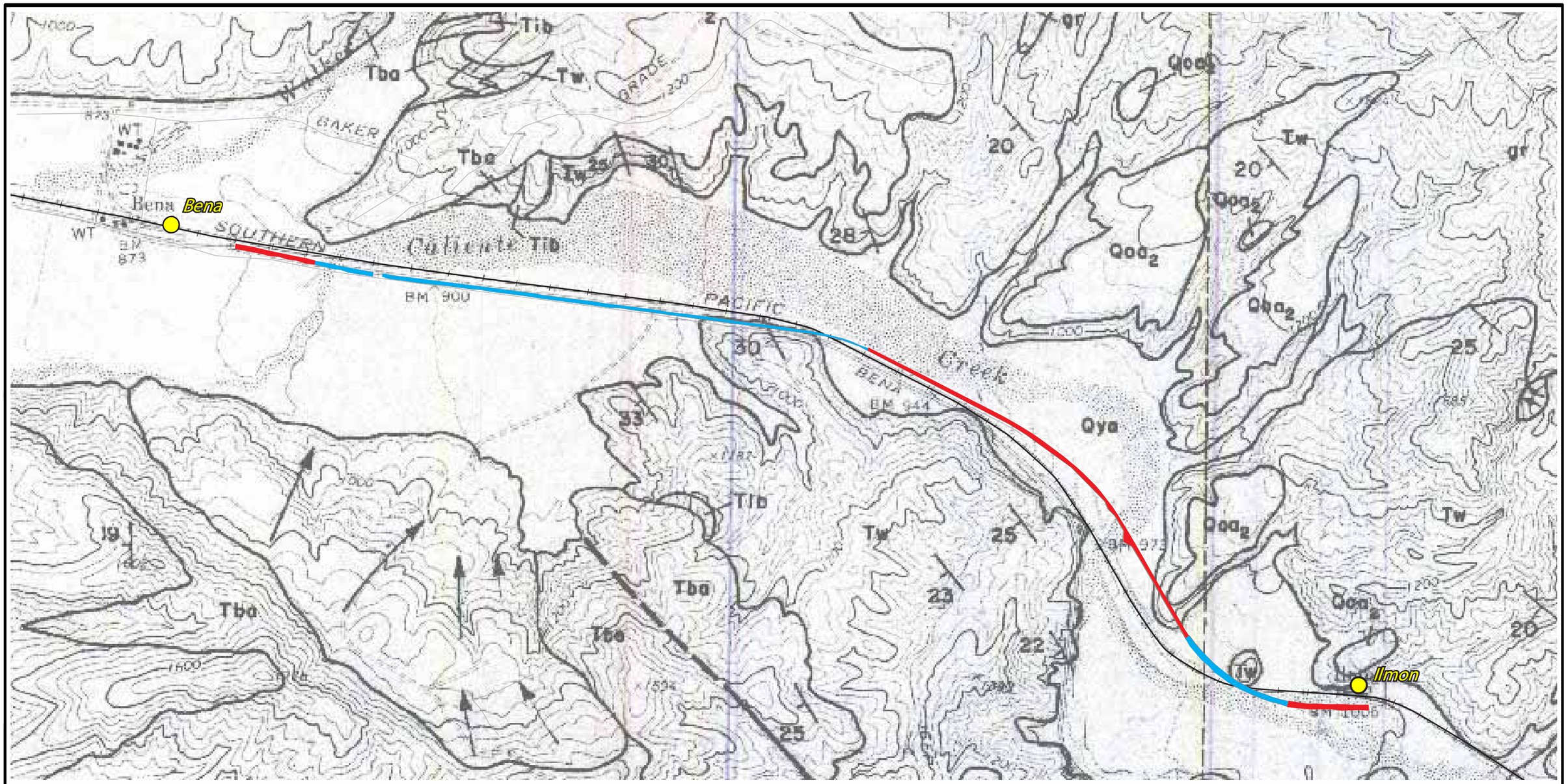


BNSF/UPRR Mojave Subdivision Tehachapi Rail Improvement Project

Paleontological Survey Sites Bena to Ilmon

July 2010	Figure 2.2-4

Sources: USGS Geologic Map



Legend

- Cities
- Cut Areas
- Fill Areas

Qya - Younger Alluv Sand, Gravel, Silt, Clay
Qoa2 - Higher Terraces Older Alluv Fan
Tw - Non Marine, Coarse Kaolinitic Sandstone
QP - Pliocene-Pleistocene Non Marine Sed Dep
Tib - Lower Miocene Crystalline Basalt
gr - Granitic Rock, Biotite Tonalite and Hornblende

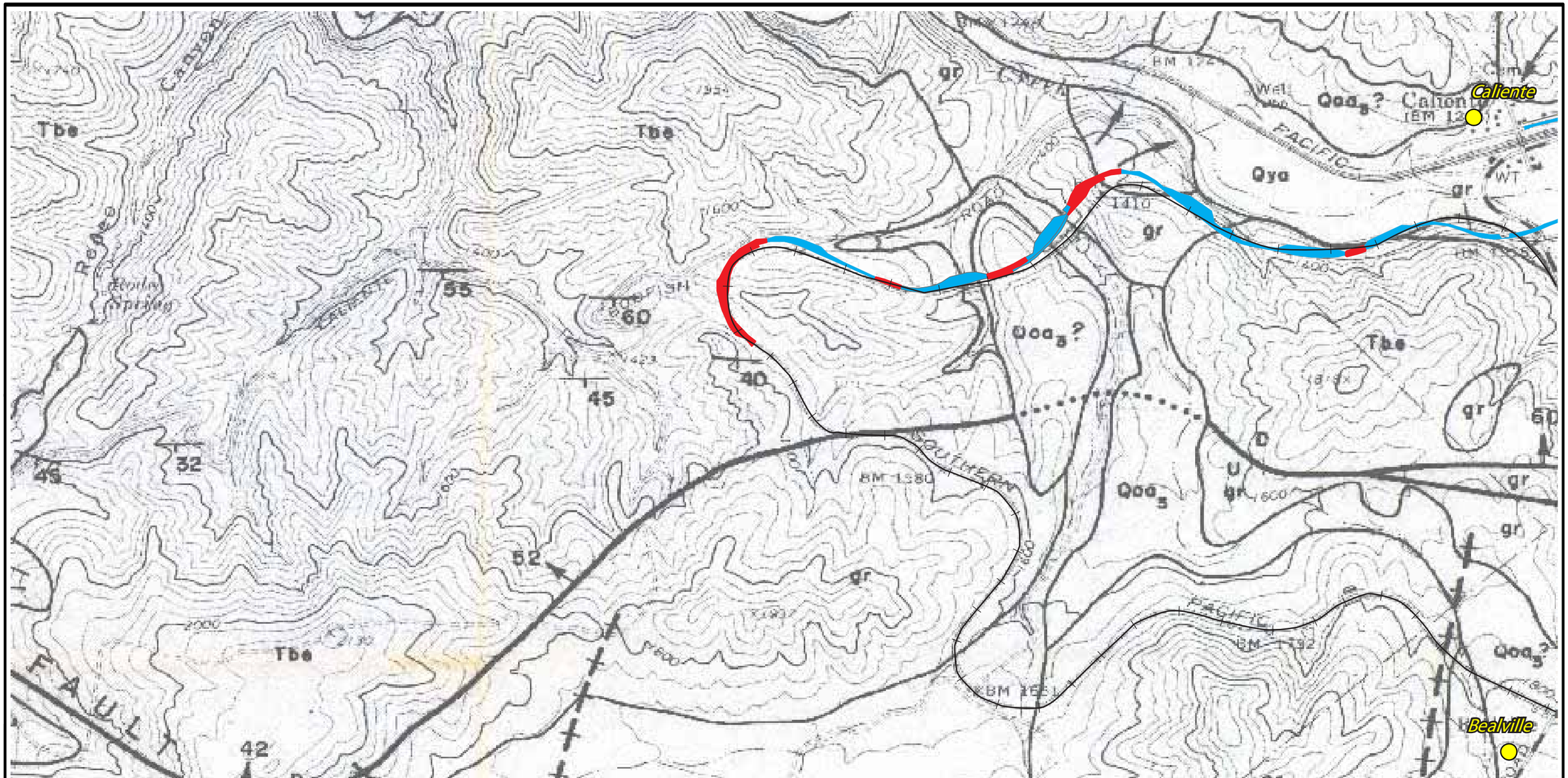
0 0.1 0.2 Miles

BNSF/UPRR Mojave Subdivision Tehachapi Rail Improvement Project

Cut and Fill Areas - Bena to Ilmon

July 2010	Figure 2.2-5

Sources: USGS Geologic Map



Legend

- Cities
- Cut Areas
- Fill Areas

Qya - Younger Alluv Sand, Gravel, Silt, Clay
Qoa2 - Higher Terraces Older Alluv Fan
Tw - Non Marine, Coarse Kaolinitic Sandstone
QP - Pliocene-Pleistocene Non Marine Sed Dep
Tib - Lower Miocene Crystalline Basalt
gr - Granitic Rock, Biotite Tonalite and Hornblende

N

0 0.1 0.2 Miles

BNSF/UPRR Mojave Subdivision Tehachapi Rail Improvement Project

Cut and Fill Areas - Caliente to Bealville

July 2010	Figure 2.2-6

Sources: USGS Geologic Map

Given that the Caltrans District 6 Paleontological Sensitivity Listing assigns the Bealville fanglomerate and Walker Formation a high sensitivity rating, potential significant impacts to paleontological resources would occur if the Build Alternative were selected.

No-Build Alternative

If the No-Build Alternative were selected, none of the geologic units would be disturbed; therefore, no impact to paleontological resources would occur under this alternative.

Avoidance, Minimization, and/or Mitigation Measures

Mitigation Measures

The following mitigation measures would reduce potential impacts to paleontological resources:

- Before project grading, BNSF Railway shall retain the services of a qualified paleontologist to prepare and certify a Paleontological Evaluation Report and Paleontological Mitigation Plan (PMP) for review and approval by Caltrans and the County of Kern before approval of grading plans. The individual(s) selected to prepare these documents shall meet the qualifications of a Principal Paleontologist, as established in the Caltrans Standard Environmental Reference.
- Before project grading, BNSF Railway shall retain the services of a qualified paleontologist to oversee and implement a paleontological monitoring effort for this project during construction at sensitive paleontological areas.

2.2.5 Hazardous Waste or Materials

Regulatory Setting

Hazardous materials and hazardous wastes are regulated by many state and federal laws. These include not only specific statutes governing hazardous waste, but also a variety of laws regulating air and water quality, human health and land use.

The primary federal laws regulating hazardous wastes/materials are the Resource Conservation and Recovery Act of 1976 and the Comprehensive Environmental Response, Compensation and Liability Act of 1980. The Resource Conservation and Recovery Act of 1976 provides for “cradle to grave” regulation of hazardous wastes. The purpose of the Comprehensive Environmental Response, Compensation and Liability Act of 1980, often referred to as Superfund, is to clean up contaminated sites so that public health and welfare are not compromised.

Other federal laws include:

- Community Environmental Response Facilitation Act (CERFA) of 1992
- Clean Water Act
- Clean Air Act
- Safe Drinking Water Act
- Occupational Safety and Health Act (OSHA)
- Atomic Energy Act
- Toxic Substances Control Act (TSCA)
- Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA)

In addition to the acts listed above, Executive Order 12088, Federal Compliance with Pollution Control, mandates that necessary actions be taken to prevent and control environmental pollution when federal activities or federal facilities are involved.

Hazardous waste in California is regulated primarily under the authority of the federal Resource Conservation and Recovery Act of 1976, and the California Health and Safety Code. Other California laws that affect hazardous waste are specific to handling, storage, transportation, disposal, treatment, reduction, cleanup and emergency planning.

Worker health and safety and public safety are key issues when dealing with hazardous materials that may affect human health and the environment. Proper disposal of hazardous material is vital if it is disturbed during project construction.

Affected Environment

Normal rail operations include the use of hazardous materials, such as oils, solvents, and other petroleum products. Hazardous materials and petroleum products are not currently stored in reportable quantities in the project area. However, the cleanup of any minor spills or releases of these products is part of normal operations.

The project is not located on sites that are included on a list of hazardous materials sites per Government Code Section 65962.5. The project is not located within an airport land use plan or near a public airport, public use airport facility, or private airstrip. The project is located within the limits of an existing railroad right-of-way alignment, except for small portions of land currently used for agricultural purposes; therefore, impacts to

emergency response plans adopted by the County of Kern or other agencies would not be anticipated as a result of project implementation.

Hazardous materials and petroleum products are transported as freight on the Union Pacific Railroad right-of-way. Consequently, there is a risk of spillage of hazardous materials and petroleum products in the project vicinity, including adjacent wildland areas during operational use. Natural disasters within the project area, such as fires, landslides or earthquakes, have the potential to result in the release of hazardous materials and/or petroleum products from ruptures in the wayside oiler system or a train derailment.

Reported Spills

Areas within the project area have known prior spills from derailments or other events. However, according to the information provided by BNSF Railway, all events were appropriately mitigated and follow-up cases are now closed. Therefore, none of these events would constitute potential impacts for the project.

A summary of these incidents is presented in Table 2.2-3.

Table 2.2-3 Spills or Releases in the Mojave Subdivision

Environmental Releases Between Mile Post 327.85 And 353.08 – Proposed Mojave Subdivision				
Date	Station	Mile Post	Description	Comments
10/25/1986	Woodford	NR 348.8	ACFX 88704 damaged and leaked due to derailment; 10-gallons of butyl acetate had spilled.	Remaining product was transloaded. Contaminated soil was removed.
7/27/1994	Woodford	NR 348.8	Derailment of four locomotives. Two fuel tanks damaged and leaked; 3,000-gallons of diesel fuel were released.	6,000 gallons of diesel were recovered; 37 truckloads of affected soil were removed, and clean imported soil was used as backfill under the oversight of Kern County Department of Environmental Health.
12/31/2001	Bena	327.9 (Used TT MP)	5 cars containing polyvinyl chloride resin and 2 hoppers of plastic pellets derailed. Plastic pellets were released.	Remaining product was transloaded. Plastic pellets were picked up by a non-hazardous contractor.
02/28/2002	Ilmon	331	PVC fire at Ilmon siding due to derailment.	Fire debris was taken to a landfill.
11/17/2007	Cliff	343.4	24 cars containing 7 HAZMAT containers derailed at Tunnel 7. Agricultural sulfur, fire retardant, cyclohexanone, and petroleum products (lube oil, antifreeze, and grease) were spilled.	39.64 tons of Non-Resource Conservation and Recovery Act petroleum-affected soil was removed. Confirmation sampling confirmed cyclohexanone and ethylene glycol were excavated and removed from the Site under the oversight of Kern County Department of Environmental Health.

Source: BNSF 2009

Spills were mainly related to petroleum products, and each spill was cleaned up according to state and federal regulations. An environmental database review did not identify spills at project-specific rail segment areas. However, there is a possibility that unreported releases from Union Pacific Railroad within project-specific rail segment areas may exist due to the long history of the right-of-way use. If present, these would be mitigated as identified.

Wayside Oilers

In the project study area are devices known as “wayside oilers,” where a film of grease or other lubricant is placed between the flanges of locomotive or railcar wheels and the inside of the rail head. Wayside oilers are located several feet before a curve in the track and are used to extend the life of the train wheels and the rail by reducing friction

generated by trains navigating curves in the railroad track. The wheels of the car help to further spread the mixture down the track. These devices consist of a tank (of various capacities up to 100 gallons) that contains a mix of oil and graphite that, when triggered by the rail car, is dispensed to the rail and wheels of the car. Historically, railroads are known to have used waste oil as a lubricant in the wayside oilers. Currently, all wayside oilers on railroad tracks through the Tehachapi Pass have liners installed beneath them to prevent leaks from migrating into surrounding soils. Some degree of dispersion by rolling stock onto the ballast is expected with the use of these devices. The highly viscous nature of the oil and graphite mixture used in the wayside oilers suggests that releases or accumulated lubricant would be confined to shallow soils in the local area and would not result in large amount of contamination. Under current conditions, contamination caused by wayside oilers is generally localized under current operations to near ballast surface soils in the vicinity of the track.

Regulatory Database Findings

Information gathered from environmental databases was used to evaluate whether activities on or near the subject property have the potential to create adverse environmental impacts on the site. Details are available in the *Limited Hazardous Materials and Wastes Investigation* of this Mitigated Negative Declaration.

The information retrieved from the databases did not indicate that the use of hazardous materials at these locations has a potential to affect the project area (no release into the project area), other than a leaking underground storage tank listing south of the Rowen-to-Woodford project segment. An unauthorized release of diesel fuel has affected the groundwater near the project area. Remediation is ongoing at this facility under oversight of the Central Valley Regional Water Quality Control Board. Based on the their regulatory status and/or distance from the subject property relative to the direction of groundwater flow in the area, the potential for the other listed facilities to create an environmental concern in the project area is considered low.

Hazards

Hazardous Materials Transport

According to the Association of American Railroads, about 6% of the total freight rail traffic is made up of hazardous materials; virtually all shipments arrive at their destination without a release caused by an accident. Technical improvements have substantially reduced the likelihood of accidental hazardous material releases. The overall hazardous material accident rate on Class I railroads has declined by 90% since 1980 and

49% since 1990. Accident frequency rates for BNSF Railway at a national level mirror the industry improvement in safety performance.

Weed Abatement and Herbicides

All BNSF Railway weed and herbicide spraying is contracted. Contractors are selected based on a proven track record of environmental responsibility. They are required to comply with all necessary licensing, permits, and certifications for the area they are working in and with manufacturers' label requirements for products used. The application of pesticides and herbicides comply with laws for application and manufacturer's label requirements. Herbicide is not applied directly to water bodies or to areas where surface water is present, or to intertidal areas below the high water mark.

Blasting Activity

Very competent crystalline bedrock outcrops have been seen in a limited portion of the project area. Depending on the rippability of these sections, blasting may be required to excavate the cuts required by the design. Blasting activity would likely occur in the Cliff Siding, Rowen-to-Woodford, and Walong-to-Marcel segments of the proposed project. If blasting is required as part of the grading activities, the hazardous materials impacts associated with blasting would be mitigated through compliance with local and state laws.

Environmental Consequences

Build Alternative

Construction Impacts

Project construction may require the excavation of areas with known or previously undiscovered contamination. Excavation necessary for embankment construction near reported spill sites and wayside oilers may result in the need for removal of potentially contaminated material. Potentially contaminated material is expected to be visibly recognizable. If contamination is encountered, it would be addressed according to applicable state and federal regulations. Areas with known spill sites and areas where stain or odiferous soils are encountered would be monitored by the Environmental Site Monitor during project implementation. During construction activities, the identification and removal of potentially contaminated materials, that may be indirectly adversely affecting local flora and fauna, may result in minor beneficial impacts to the project area.

Operational Impacts

Operation under the implementation of the Build Alternative would increase the amount of hazardous materials being transported in the railroad right-of-way. Proper implementation of standard operating procedures is expected to mitigate this and minimize potential exposure to these hazards. These procedures include pre-positioned spill equipment and a rapid response cleanup contractor on retainer to respond to a potential derailment involving hazardous materials.

No-Build Alternative

Construction and Operational Impacts

Under the No-Build Alternative, the project would not be built through the project area. No contaminated material would be exposed, and potential beneficial impacts from disposal of excavated potentially contaminated material would not be realized. Operational activities under this alternative would remain the same as they are now; therefore, no new impacts or mitigation measures would be anticipated.

Avoidance, Minimization, and/or Mitigation Measures

Minimization Measures

Measures to minimize hazardous-related impacts would include:

- During project construction, BNSF Railway shall retain the service of an on-call, qualified professional industrial hygiene firm to support the Environmental Site Monitor present to monitor grading activities. If environmental contamination is observed, remedial actions shall occur prior to continued project construction.
- If hazardous contamination is encountered within construction area limits, BNSF Railway shall retain a qualified Environmental Site Monitor to ensure all construction activities are stopped and address the situation according to applicable state and federal regulations before beginning construction.
- All construction- and maintenance-related waste, including trash and litter, garbage, other solid waste, petroleum products, and other potential hazardous materials, would be properly handled by BNSF Railway's construction personnel in accordance with state and federal regulations and permit requirements and removed from the site to a permitted disposal facility. All trash containers would have sealed and secured lids.
- BNSF Railway and its construction personnel shall be responsible to ensure all major equipment maintenance and vehicle fueling within the construction area would occur within a lined containment area to prevent release to the surrounding environment.

- A Fire Suppression Management Plan would be prepared by BNSF Railway or its contractor(s) and approved by County Fire Department before beginning earth-moving activities. The plan would outline the procedures to be followed to prevent accidental fire from construction activities. The plan would contain a chain of command, contact information (including fire departments), and location and placement of fire suppression equipment such as water trucks and fire extinguishers. Monitoring contractor compliance with the Fire Suppression Management Plan would be the responsibility of the Environmental Site Monitor present on-site during grading activities and retained by the project proponent before construction.
- BNSF Railway shall prepare a Construction Emergency Response Plan to be approved by County Fire Department before beginning work and implemented by BNSF Railway's contractor(s) during construction activities.
- BNSF Railway shall continue to maintain current operating rules and procedures during project construction and operation, as well as the current System Hazardous Materials Emergency Response Plan, to reduce the risk of an accident and minimize the potential risk of exposure to hazardous materials.
- BNSF Railway shall continually monitor project construction activities to ensure that smoking, firearms and domestic pets are not present on work sites. Protected smoking areas may be established at locations that pose no fire hazards.
- BNSF Railway shall continue to use its current procedures for weed abatement during construction and operation to ensure that all waterway, bridges, etc. are buffered to comply with laws for pesticide application and manufacturer's label requirements, and that herbicide shall not be applied directly to water or to areas where surface water is present.

Blasting activity would likely occur in the Cliff Siding, Rowen-to-Woodford, and Walong-to-Marcel segments of the proposed project. To remediate impacts from the blasting activity, BNSF Railway shall implement the following minimization measures:

- Before beginning construction activities, BNSF Railway shall retain the services of a blasting contractor licensed to use Class A explosives, and licensed as a contractor in the State of California, to conduct any blasting required for project construction. The contractor shall comply with all applicable regulations and standards established by the regulatory agencies, codes, and professional societies including the rules and regulations for storage, transportation, delivery, and use of explosives. Compliance

with California Code of Regulations, Title 8 (Division of Occupational Safety and Health - Cal/OSHA).

In addition to these basic requirements, a blasting plan may be required by Caltrans or the County of Kern Building Department to address specific mitigation measures on a site-/impact-specific basis. A blasting plan is intended to help ensure worker safety and the protection of natural, historic and cultural resources. Other requirements or restrictions may apply based on regulatory review. Elements of a blasting plan would include:

- Description of the procedures to be implemented to protect workers during blasting
- Description of the procedures for proper storage and transportation of explosive materials
- Prohibiting blasting during extreme fire danger periods
- Description of the procedures to prevent impact to biological resources
- Detail procedures to ensure that flyrock, air blast, and ground vibration are controlled
- Procedures to protect existing facilities and utility lines
- Procedures for notifications to local residents and businesses nearby blast areas

2.2.6 Air Quality

Regulatory Setting

The Clean Air Act as amended in 1990 is the federal law that governs air quality. Its counterpart in California is the California Clean Air Act of 1988. These laws set standards for the quantity of pollutants that can be in the air. At the federal level, these standards are called National Ambient Air Quality Standards (NAAQS). Standards have been established for six criteria pollutants that have been linked to potential health concerns; the criteria pollutants are: carbon monoxide (CO), nitrogen dioxide (NO_2), ozone (O_3), particulate matter (PM), lead (Pb), and sulfur dioxide (SO_2).

Under the 1990 Clean Air Act Amendments, the U.S. Department of Transportation cannot fund, authorize, or approve federal actions to support programs or projects that are not first found to conform to State Implementation Plan for achieving the goals of the Clean Air Act requirements. Conformity with the Clean Air Act takes place on two levels—first, at the regional level and second, at the project level. The proposed project must conform at both levels to be approved.

Regional level conformity in California is concerned with how well the region is meeting the standards set for carbon monoxide (CO), nitrogen dioxide (NO_2), ozone (O_3), and particulate matter (PM). California is in attainment for the other criteria pollutants. At the regional level, Regional Transportation Plans (RTP) are developed that include all of the transportation projects planned for a region over a period of years, usually at least 20. Based on the projects included in the Regional Transportation Plan, an air quality model is run to determine whether or not the implementation of those projects would conform to emission budgets or other tests showing that attainment requirements of the Clean Air Act are met. If the conformity analysis is successful, the regional planning organization, such as Kern Council of Government and the appropriate federal agencies, such as the Federal Highway Administration, make the determination that the Regional Transportation Plan is in conformity with the State Implementation Plan for achieving the goals of the Clean Air Act. Otherwise, the projects in the Regional Transportation Plan must be modified until conformity is attained. If the design and scope of the proposed transportation project are the same as described in the Regional Transportation Plan, then the proposed project is deemed to meet regional conformity requirements for purposes of project-level analysis.

Conformity at the project-level also requires “hot spot” analysis if an area is “nonattainment” or “maintenance” for carbon monoxide (CO) and/or particulate matter. A region is a “nonattainment” area if one or more monitoring stations in the region fail to attain the relevant standard. Areas that were previously designated as nonattainment areas but have recently met the standard are called “maintenance” areas. “Hot spot” analysis is essentially the same, for technical purposes, as carbon monoxide or particulate matter analysis performed for National Environmental Policy Act purposes. Conformity does include some specific standards for projects that require a hot spot analysis. In general, projects must not cause the carbon monoxide standard to be violated, and in “nonattainment” areas the project must not cause any increase in the number and severity of violations. If a known carbon monoxide or particulate matter violation is located in the project vicinity, the project must include measures to reduce or eliminate the existing violation(s) as well.

Affected Environment

Three of the five project segments sit within the San Joaquin Valley Air Basin, which covers eight counties in California’s Central Valley. The portion of Kern County in the San Joaquin Valley Air Pollution Control District jurisdiction straddles the Sierra Nevada and Tehachapi mountains.

Two of the five project segments sit within the Mojave Desert Air Basin. The eastern portion of Kern County, where the two project segments are located, is regulated by the Kern County Air Pollution Control District.

It is anticipated that most emissions created during project construction would be generated from the staging areas used for stockpiling construction fill materials or as laydown areas. The staging areas are for temporary use during construction and extend beyond the current Union Pacific Railroad right-of-way. The staging areas sit at previously disturbed areas with established access to public roads.

Project Emissions

To determine whether the implementation of the proposed project would cause potentially significant air quality impacts, emissions associated with construction and operational activities were quantified and compared with the corresponding annual significance thresholds established by the San Joaquin Valley Air Pollution Control District and the Kern County Air Pollution Control District.

Construction Emissions

Criteria air pollutant emissions from construction activities are primarily from fugitive dust and exhaust emissions from construction equipment, such as site grading equipment, vehicles used to deliver construction material, and worker vehicles. Fugitive dust is generated from construction equipment traveling on unpaved roads (dirt roads). To accurately determine the significance of air quality impacts from construction activities, construction emissions have to be quantified and compared to the significance thresholds set by the San Joaquin Valley Air Pollution Control District and the Kern County Air Pollution Control District. Therefore, project-specific data, such as construction timeline and dimensions of the project site along with general operating guidelines, were used as inputs to the Urban Emissions Model (URBEMIS2007 Version 9.2.4) to quantify construction emissions.

Operational Emissions

The operational emissions analysis was done for baseline 2008 and future 2020 calendar year scenarios to address possible effects of technology changes in response to upcoming regulatory requirements. Operational emissions are associated with the movement of freight through the project segments. For criteria pollutants, operational emissions from the project were estimated by analyzing baseline (2008) and future (2020) opening year emissions based on fuel use per train throughout the 5.78 miles within the San Joaquin

Valley Air Pollution Control District and the 2.56 miles within the Kern County Air Pollution Control District.

Baseline operational emissions reflect the annual emissions for existing operations in which the sustainable capacity of 50 trains on a single track within the project area is analyzed. Future operational emissions reflect the annual emissions in which the future increased sustainable capacity of 65 trains within the project area is analyzed. The difference between existing emissions and future project emissions represent the annual emissions increase from the proposed project; these emissions were compared to the applicable San Joaquin Valley Air Pollution Control District and Kern County Air Pollution Control District operational thresholds of significance to determine whether or not the project would have a significant impact to air quality.

Environmental Consequences

Build Alternative

Construction Impacts

Exhaust and fugitive dust emissions from construction activities on-site are likely to vary daily as construction activity levels change and also depend on routine train operational requirements. A summary of the estimated peak construction emissions compared to the applicable thresholds of significance in each respective air district is presented below.

Table 2.2-4 San Joaquin Valley Air Pollution Control District Estimated Peak Construction Emissions

	Criteria Pollutants (tons per year)					
	VOC	NO_X	CO	SO_2	PM_{10}	$PM_{2.5}$
Peak Construction Emissions	0.86	7.39	4.25	0.00	0.47	0.33
San Joaquin Valley Air Pollution Control District Threshold	10	10	None	None	15	None
Exceeds Threshold?	No	No	N/A	N/A	No	N/A

Construction emissions would not exceed the San Joaquin Valley Air Pollution Control District annual thresholds for Volatile Organic Compound, Nitrogen Oxide or Particulate Matter under 10 Microns.

Table 2.2-5 Kern County Air Pollution Control District Estimated Peak Construction Emissions

	Criteria Pollutants (tons per year)					
	VOC	NO_X	CO	SO_2	PM_{10}	$PM_{2.5}$
Peak Construction Emissions	1.06	9.99	4.77	0.00	0.54	0.44
Kern County Air Pollution Control District Threshold	25	25	None	27	15	None
Exceeds Threshold?	No	No	N/A	No	No	N/A

Construction emissions would not exceed the Kern County Air Pollution Control District annual thresholds for Volatile Organic Compound, Nitrogen Oxide Sulfur Dioxide or Particulate Matter under 10 Microns.

Operational Impacts

The implementation of the project would increase the future sustainable capacity of the railway to 65 trains per day by the 2020 opening year. Operational emissions in 2020 associated with the project would be lower than those of the No-Build scenario based on current projections for locomotive technology and standards, as freight transportation by rail is estimated to be three or more times more fuel-efficient than heavy-duty diesel trucks, according to information distributed by the American Association of Railroads in 2005. A summary of the estimated operational emissions increase compared to the applicable thresholds of significance in each respective air district is presented below.

Table 2.2-6 San Joaquin Valley Air Pollution Control District Estimated Emissions Increase Due to Project

	Criteria Pollutants (tons per year)				
	VOC	NO_X	CO	SO_2	PM_{10}
Operational Emissions Increase	-10.75	-95.22	18.85	0.00	-4.99
San Joaquin Valley Air Pollution Control District Threshold	10	10	None	None	15
Exceeds Threshold?	No	No	N/A	N/A	No

Operational emissions would not exceed the San Joaquin Valley Air Pollution Control District annual thresholds for Volatile Organic Compound, Nitrogen Oxide or Particulate Matter under 10 Microns.

Table 2.2-7 Kern County Air Pollution Control District Estimated Emissions Increase Due to Project

	Criteria Pollutants (tons per year)				
	VOC	NO_X	CO	SO_2	PM_{10}
Operational Emissions Increase	-4.76	-42.17	8.35	0.00	-2.21
Kern County Air Pollution Control District Threshold	25	25	None	27	15
Exceeds Threshold?	No	No	N/A	No	No

Operational emissions would not exceed the Kern County Air Pollution Control District annual thresholds for Volitle Organic Compounds, Nitrous Oxide, Sulfur Dioxide and Particulate Matter under 10 microns.

No-Build Alternative

Construction and Operational Impacts

Under the No-Build Alternative, the proposed project would not be built and the existing conditions would remain unchanged. No significant impacts related to construction and operation would occur as a result of the No-Build Alternative.

Avoidance, Minimization, and/or Mitigation Measures

Construction activities and operations of the railroad facility would comply with all applicable San Joaquin Valley Air Pollution Control District rules and regulations, including, but not limited to Rule 4102, Rule 4641, Regulation VIII and Kern County Valley Air Pollution Control District rules and regulations, including Rule 401, Rule 402, Rule 210.1, Rule 419, and Rule 404.1.

Minimization Measures

To minimize the impacts from exhaust and fugitive dust emissions from construction activities on-site, the project proponent would implement the following measures:

- During construction, BNSF Railway and its contractor shall monitor vehicular construction activities to ensure the speed on unpaved roads is maintained at less than 15 miles per hour.
- During construction, BNSF Railway and its contractor shall monitor construction activities and manage haul road dust by watering 3 times per day.

2.2.7 Noise and Vibration

Regulatory Setting

California Environmental Quality Act

The California Environmental Quality Act requires a strictly baseline versus build analysis to assess whether a proposed project will have a noise impact. If a proposed project is determined to have a significant noise impact under the California Environmental Quality Act, then the California Environmental Quality Act dictates that mitigation measures must be incorporated into the project unless such measures are not feasible.

Under California, the noise metrics used to quantify noise exposure levels and determine impacts is the Community Noise Equivalent Level, or CNEL. This is a time weighted average sound level for a period of at least 24-hours and is calculated by adding a 5 dB penalty to noises occurring during the evening hours (7:00 p.m. to 10:00 p.m.) and adding a 10 dB penalty only to noises occurring during the night period (10:00 p.m. to 7:00 a.m.). After the weighting factors are applied, the overall noise level is averaged over the entire 24-hour period. A metric very similar to this one is the Day Night Level (L_{dn} or DNL). The difference between the L_{dn} and CNEL is that the Ldn metric does not apply a weighting for noises during the evening hours (7:00 p.m. to 10:00 p.m.). The CNEL and L_{dn} noise metrics are typically within 0.5 dB of each other so they are often used interchangeably.

Affected Environment

Property next to the existing railroad rights-of-way consists mostly of private lands under the jurisdiction of the County of Kern. Land is used mainly for livestock and grazing, with some single-family residences, resource conservation, and industrial and commercial land uses scattered throughout.

Construction noise from the project was predicted for distances corresponding to the nearest noise-sensitive land uses. Vibration levels from the project were also predicted

and assessed using applicable vibration impact criteria under the California Environmental Quality Act and other local standards and applicable criteria adopted by the County of Kern. Short- and long-term noise measurement locations, as well as vibration measurement locations, were selected. These are identified in Tables 2.2-8 through 2.2-10. A detailed description of measurement locations is described in the Noise Technical Report included with the Combined Technical Reports document of this Mitigated Negative Declaration. A summary of the measurement results is shown in Tables 2.2-11 through 2.2-13.

Table 2.2-8 Short-Term Noise Measurement Locations

Site ID	Location
ST-1A & B	12500 Caliente Bodfish Road
ST-2A & B	28017 J Street
ST-3A & B	31370 Bealville Road
ST-4	31430 Bealville Road
ST-5	East Bena Switch
ST-7A, B, C & D	Cesar Chavez Cultural Center Administration Building
ST-8A, B, C & D	30378 Woodford-Tehachapi Road
ST-9A & B	26798 Woodford-Tehachapi Road
ST-10A, B, C & D	21812 Broome Road Loop Ranch

Table 2.2-9 Long-Term Noise Measurement Locations

Site ID	Location
LT-1	28061 J Street
LT-2	27600 Caliente Creek Road
LT-3	Cesar Chavez Cultural Center - Museum Garden
LT-4	Cesar Chavez Cultural Center - Conference Center
LT-5	27300 Woodford-Tehachapi Road
LT-6	21812 Broome Road Loop Ranch

Table 2.2-10 Vibration Measurement Locations

Site ID	Location
Location A	Near the southern fence line of adjoining residential properties, including 28017 J Street, about 135 feet north of the existing tracks.
Location B	Along the southern fence line of the property at the eastern corner of the intersection of Bealville Road and the rail line, about 97 feet north of the existing tracks.
Location C	Between the parking area and the Chavez Center campus service road, so that the measurement position is about on the same plane as the Administration Building eastern façade. Approximate distance to the existing tracks is 141 feet.
Location D	Near a corral fence line, so that the measurement position is about on the same plane as the western façade of one of the occupied residential structures on the property. Approximate distance to the existing tracks to the west is 279 feet, and about 381 feet to the existing tracks to the east.

Environmental Consequences

Using measurement, modeling, and assessment methodologies developed for freight rail operators by Kern County and Federal Transportation Administration, the noise and vibration effects of the project were predicted and compared to existing and future-without-project conditions. The predicted increase in noise levels due to the project were then assessed with respect to the applicable guidance set forth by the California Environmental Quality Act Guidelines. These guidelines state that a significant operational noise impact would result if:

- The project causes the Community Equivalent Noise Level identified at the property line to increase by 3 dBA; or
- Noise occurs within the “normally unacceptable” or “clearly unacceptable” noise/land use compatibility category

The increase in noise level generated by the project was compared to the standards established in the Kern County Noise Ordinance, which limits the hours for temporary construction activity from 6:00 a.m. to 9:00 p.m. on weekdays and from 8:00 a.m. to 9:00 p.m. on weekends.

The Federal Transportation Agency Noise Impact Assessment Spreadsheet model (2007) was used to calculate noise levels due to train operations on the rail line for both existing and future-with-project scenarios. The modeling accounted for the distribution of train activity along the tracks in each scenario. In the existing scenario, 50% of the 50 total

BNSF Railway and Union Pacific Railroad trains per day were assumed to run to the east (uphill) and 50% were assumed to run to the west (downhill). Because the railroad line currently operates at or near capacity, the future-no-project scenario is acoustically the same as the existing scenario. The eastbound and westbound distribution of BNSF Railway and Union Pacific Railroad trains is unchanged under the future-with-project scenario. In the future-with-project scenario, the sustainable capacity is expected to increase to 65 total trains per day. The increase in capacity represents a maximum increase in noise level of 1.3 dB CNEL and therefore would not represent an impact under either CEQA or the County of Kern noise standards.

- Noise: Rail noise was the dominant noise source at all measurement locations. The existing noise levels were measured at representative noise sensitive locations. The estimates include parameters such as project type and location of alternatives, representative noise source levels, design speed, time, and frequency of operation.
- Vibration: Vibration measurements were made at four different locations along the proposed project. The vibration measurement sites were chosen to represent potentially vibration-sensitive buildings and land uses.

The analysis found that noise from daily railroad operations associated with the proposed project, when combined with high existing railroad noise levels, would result in moderate to no impact on representative noise-sensitive receptors. While using noise barriers (soundwalls or berms) could effectively decrease the overall noise exposure at the affected sites, the actual projected increase in noise (up to 1.3 decibels) would be so small as to be considered not substantial by California Environmental Quality Act Guidelines, and the rural nature of the project site would make the use of noise barriers infeasible and unreasonable.

A detailed description of the methodology and measurement results is described in the Noise Technical Report included with the Combined Technical Reports document of this Mitigated Negative Declaration.

Table 2.2-11 Short-Term Noise Measurement Results

Site ID	Measurement Period		Noise Source	Existing Ambient Noise Level (dBA Leq)
	Start Date	Duration		
ST-1A and 1B	3/16/2009	1:26	Ambient: Caliente-Bodfish traffic, birds, dogs, cattle, rustling of leaves from wind; 4 trains (3 EB,1 WB)	59.0
ST-2A and 2B	3/16/2009	1:26	Ambient: Caliente-Bodfish traffic, birds, dogs, rustling of leaves from wind; 2 trains (EB BNSF)	60.0
ST-3A and 3B	3/17/2009	1:01	Ambient: Bealville Road traffic, birds, 6 trains (2 EB- 4 WB)	74.8
ST-4	3/17/2009	1:00	Ambient: Bealville Road traffic, birds, 4 trains (1EB-3WB)	53.9
ST-5	3/19/2009	1:00	Ambient: Bena Road traffic, birds, 2 trains (2 EB)	74.7
ST-7A, ST-7B, ST-7C, and ST-7D	3/17/2009	1:04	Ambient: local and distant State Route-58 traffic, rustling leaves, 6 trains (2EB-4 WB)	73.4
ST-8A, ST-8B, ST-8C, and ST-8D	3/18/2009	1:00	Traffic on State Route-58, 4 trains (2EB-2 WB)	66.8
ST-9A and ST-9B	3/18/2009	1:01	Traffic on State Route-58, 6 trains (4WB - 2EB)	53.8
ST-10A, ST-10B, ST-10C, and ST-10D	3/19/2009	2:00	Traffic on State Route-58, 1 train (1 WB)	76.7

Table 2.2-12 Long-Term Noise Measurement Result

Receptor Site	Existing/Future No-Project Scenario			Project Scenario		FTA Impact
	Existing Ambient Noise Level (dBA 24-hr Leq)	Existing Measured Train Noise (dBA Ldn)	Modeled Train Noise Level Existing Capacity (dBA Ldn)	Modeled Train Noise Level with Project (dBA Ldn)	Modeled Project plus Ambient Noise Exposure Increase (dBA)	
LT-1	74.1	81.0	83.7	83.9	0.2	Moderate impact
LT-2	70.1	76.4	78.6	78.7	0.1	No impact
LT-3	65.2	71.7	73.9	75.2	1.3	Moderate impact
LT-4	68.3	74.0	76.1	76.7	0.7	Moderate impact
LT-5	73.6	80.9	82.7	83	0.2	Moderate impact
LT-6	65.8	72.0	74.4	74.9	0.5	Moderate impact

Table 2.2-13 Vibration Measurement Results

Receptor	Existing/Future No-Project Scenario		Project Scenario		FTA Vibration Impact?[1]
	Measured Vibration (VdB)	Modeled Vibration (VdB)	FTA Vibration Impact?	Modeled Vibration from BNSF Track (VdB)	
Vib-A/ST-2	74.4	72	No	72	No
Vib-B/ST-3	77.7	65	No	65	No
Vib-C/ST-7	71.6	76	No	77	No
Vib-C/LT-3	--	64	No	64	No
Vib-C/LT-4	--	67	No	68	No
Vib-D/ST-10	61.8	65	No	65	No

Build Alternative

Construction Impacts

Construction activities for this project would require the use of vehicles and heavy equipment, ranging from concrete mixers to jackhammers, producing potentially significant noise and vibration. Construction noise is unavoidable and could adversely affect nearby residents during construction. Project-related construction would result in an increase of ambient noise up to 6 dBA from current daytime noise level measured at the LT-1 and LT-5 locations, as indicated in Table 2.2.12. This represents a potentially significant impact under California Environmental Quality Act Guidelines. However, as long as construction activities take place during daytime hours (6:00 a.m. to 9:00 p.m.), noise from temporary construction activities would be exempt from the Kern County Noise Ordinance.

Vibration from construction activities at the nearest sensitive property is expected to be mostly imperceptible while construction is underway, as indicated in Table 2.2.13. No substantial vibration impacts would result during project construction.

Operational Impacts

Increases in operational noise from the Build Alternative is within the County of Kern standards for operational noise impact. The predicted change in operational noise level due to the project ranges from an inaudible 0.1 dBA L_{dn} to 1.3 dBA L_{dn}. The increases in operational noise would result in a moderate impact according to Federal Transit

Administration methodology for all sites except one. The increase in operational noise would not result in a substantial impact as the increase does not exceed a 3 dBA L_{dn} incremental increase in ambient noise level.

No-Build Alternative

With the No-Build Alternative, the extended sidings in the five project areas would not be built and railroad operations in the region would continue as they are now. BNSF Railway and Union Pacific Railroad rail traffic would operate along the same lines as they do now. Construction would not occur; noise and vibration levels from BNSF Railway and Union Pacific Railroad activity would be the same as under existing conditions.

Avoidance, Minimization, and/or Noise Abatement

Construction Noise

Construction noise is unavoidable and could adversely affect nearby residents during construction. Construction noise levels may exceed the existing hourly average noise levels; however, the noise would be temporary and limited to the duration of the construction in the immediate vicinity of the receptor.

Minimization Measures

To minimize construction noise, BNSF Railway shall implement the following measures into the project contract specifications before beginning construction activities:

- All noise-producing project equipment and vehicles using internal combustion engines shall be equipped with mufflers, air-inlet silencers where appropriate, and any other shrouds, shields, or other noise-reducing features in good operating condition that meet or exceed original factory specification. Mobile or fixed “package” equipment (e.g., arc-welders, air compressors) shall be equipped with shrouds and noise control features that are readily available for that type of equipment.
- All project workers exposed to noise levels above 80 dBA shall be provided with personal protective equipment for hearing protection (i.e., earplugs and/or earmuffs); areas where noise levels are routinely expected to exceed 85 dBA shall be clearly posted with signs stating “Hearing Protection Required in this Area.”
- Before beginning daily construction activities and throughout project construction, BNSF Railway and its contractor shall ensure material stockpiles and mobile

equipment staging, parking, and maintenance areas are located at least 500 feet away from noise-sensitive receptors.

- During project construction, BNSF Railway and its contractor shall ensure workers operating construction vehicles on-site are not exceeding established construction vehicle speed limits of 15 miles per hour.
- During project construction and operation, BNSF Railway and its contractor shall ensure the use of construction-related noise-producing signals, including horns, whistles, alarms, and bells, are used for safety warning purposes only.
- During project construction, BNSF Railway and its contractor shall ensure that any construction-related or project-related public address or music systems used are not audible at any adjacent sensitive receptor.
- During project construction, BNSF Railway and its on-site construction supervisor shall have the responsibility and authority to receive and resolve noise complaints. A clear appeal process for those filing noise complaints shall be established by BNSF Railway before construction begins that would allow for resolution of noise problems that cannot be immediately solved by the site supervisor.

Operational Noise

The projected increases in noise due to project operations would be less than the County of Kern noise standard and less than the California Environmental Quality Act Guidelines noise standard. Thus, noise mitigation measures would not be necessary.

Construction and Operational Vibration

Because no vibration impacts are predicted during the construction phase of the project, no mitigation measures are recommended or necessary. Project operations would not generate new vibration impacts, so no mitigation measures are recommended.

2.3 Biological Environment

2.3.1 Natural Communities

Affected Environment

A Natural Environment Study-Minimal Impacts report was prepared to evaluate the on-site biological resources and determine the potential for occurrence of common and

special-status species, their habitats, and other special aquatic resource areas within the biological study area of the proposed project as shown in Figure 2.3-1. This report was prepared in November 2009 and is available for review in the Combined Technical Reports document of this Mitigated Negative Declaration. The biological study area includes 15 vegetation communities, which are listed and described below.

Blue Oak Woodland

Blue Oak Woodland is a highly variable climax woodland dominated by blue oak (*Quercus douglasii*), but usually includes individuals of several other oaks as well as gray pine (*Pinus sabiniana*). Stands vary from open savannas with grassy understories, usually at lower elevations, to fairly dense woodlands with shrubby understories. Blue Oak Woodland usually occurs on well-drained soils, usually below 2000 feet to 4000 feet. Blue Oak Woodland can be found along the Caliente-to-Bealville, Cliff Siding Extension, and Rowen-to-Woodford segments of the biological study area.

Central Coast Cottonwood-Sycamore Riparian Forest

Central Coast Cottonwood-Sycamore Riparian Forest is a moderately closed broadleaved riparian forest dominated by western sycamore (*Platanus racemosa*) and Fremont cottonwood (*Populus fremontii*), with lesser amounts of coast live oak (*Quercus agrifolia*). Understories may be dense thickets of shrubby wouldows (*Salix* ssp.), mule fat (*Baccharis*) or giant creek nettle (*Urtica dioica*). It favors the floodplains of sub-perennial streams, usually with a fairly coarse bed load and seasonally variable depths to the water table. Central Coast Cottonwood-Sycamore Riparian Forest can be found along the Bena-to-Ilmon, Calient-to-Bealville, and Rowen-to-Woodford segments of the biological study area.

Foothill Pine-Oak Woodland

Foothill Pine-Oak Woodland is climax woodland that is a mix of gray pine and blue oak. Pure stands of either tree do occur, but mixed stands are much more common. Gray pine usually towers over the oaks in undisturbed stands. Understories usually are dominated by introduced annuals. This woodland favors well-drained sites and is usually found on rocky or exposed sites along ridges or canyons with poor or shallow soils. Foothill Pine-Oak Woodland can be found along the Walong-to-Marcel segment of the biological study area.

Mojave Mixed Woody Scrub

Mojave Mixed Woody Scrub is a complex Desert Scrub community that is open enough to be passable and is usually characterized by Joshua tree (*Yucca brevifolia*), California buckwheat (*Eriogonum fasciculatum*) and bladderpod (*Isomeris arborea*).

Mojave Mixed Woody Scrub occurs on very shallow, overly drained, and often rolling to steep soils. Sites containing this vegetation have an extremely low water-holding capacity, mild alkalinity, and low salinity. It merges into deeper soils (with a higher water-holding capacity) or at cooler elevations with Great Basin Scrub, Blackbush Scrub, or Pinyon Woodlands and at warmer elevations with Creosote Bush Scrub.

Within the biological study area, Mojave Mixed Woody Scrub was dominated by a mix of shrubs, including California buckwheat, brittlebush (*Encelia farinosa*), California joint-fir (*Ephedra californica*), rubber rabbitbrush (*Chrysothamnus nauseosus*), California sagebrush (*Artemisia californica*), and chaparral yucca (*Yucca whipplei*). This community often occurs along hillsides interspersed with other xeric shrub communities. Mojave Mixed Woody Scrub can be found along the Caliente-to-Bealville, Cliff Siding Extension, and Walong-to-Marcel segments of the biological study area.

Mule Fat Scrub

Mule Fat Scrub is a tall, herbaceous riparian scrub strongly dominated by mule fat. This vegetation is maintained by frequent flooding. Absent frequent flooding, most stands would succeed to cottonwood- or sycamore-dominated riparian forests or woodlands. This community favors intermittent stream channels with fairly coarse substrate and a moderate depth to water table. Mule Fat Scrub can be found along the Caliente–to-Bealville segment of the biological study area.

Non-Native Grassland

Non-native Grassland can be found throughout the whole biological study area and is described as having a dense to sparse cover of non-native annual grasses. These areas are characterized by a dense to sparse cover of annual grasses, often with interspersed native and non-native annual forbs. This habitat is a disturbance-related community most often found in old fields or openings in native scrub habitats. It favors fine-textured, usually moist clay soils that can become waterlogged during the winter rainy season and very dry during summer and fall. Typical grasses within the biological study area include foxtail chess (*Bromus madritensis*), ripgut grass (*Bromus diandrus*), wild oat (*Avena* sp.), cheat grass (*Bromus tectorum*), and wheat (*Triticum aestivum*). Characteristic forbs include

red-stem filaree (*Erodium cicutarium*), black mustard (*Brassica nigra*), and broad-lobed filaree (*Erodium botrys*).

Sandy Wash

Sandy Wash is composed of open, sandy areas next to and within washes and drainages, with a sparse cover of riparian plant species. A small amount of sandy wash can be found along the Bena-to-Ilmon segment of the biological study area.

Sierra-Tehachapi Saltbush Scrub

Sierra-Tehachapi Saltbush Scrub is an open shrub land dominated by allscale (*Atriplex polycarpa*) and several other shrubs, interspaced with introduced and native annual grasses and forbs. This community favors rolling to hilly dissected alluvial fans with sandy to loamy, non-alkaline soils with good drainage. Sierra-Tehachapi Saltbush Scrub can be found along the Bena-to-Ilmon segment of the biological study area.

Southern Alluvial Fan Scrub

Southern Alluvial Fan Scrub vegetation communities occur on alluvial outwash fans throughout the Bena-to-Ilmon and Caliente-to-Bealville segments of the biological study area. Southern Alluvial Fan Scrub communities are generally associated with infrequently scoured areas on floodplains and out-wash fans. These plant communities are composed of evergreen woody and drought-deciduous shrubs with a significant component of larger evergreen shrubs, typically found in chaparral and areas adapted to survival in periodic flooding. Scalebroom (*Lepidospartum squamatum*) is considered to be an indicator species of alluvial scrubs and is usually described as a dominant or subdominant shrub in alluvial community descriptions.

Sycamore Alluvial Woodland

Sycamore Alluvial Woodland is open to moderately closed winter-deciduous broadleaved riparian woodland dominated by well-spaced western sycamore. California buckeye (*Aesculus californica*) and Mexican elderberry (*Sambucus mexicana*) are widely spaced in the subcanopy. Understories are usually introduced grasses or mule fat. This community favors braided, deposited channels of intermittent streams, usually with a cobble/boulder substrate. These streams rely on rainfall, rather than snowmelt, for their water supply and are usually flowing water only for brief periods after storms. These flows may be quite violent, damaging or even uprooting trees. Sycamore Alluvial Woodland can be found along the Rowen-to-Woodford segment of the biological study area.

Developed

Developed areas occur throughout the entire biological study area and include roadways, parking lots, vacant lots, residences, commercial buildings, and other private/public infrastructure. No native habitat exists within these developed areas, but some native plant species are included within ornamental landscape plantings.

Environmental Consequences

Build Alternative

Construction and Operational Impacts

Permanent and temporary impacts are being limited to reduce adverse impacts to biological resources. Impacts may include minor habitat loss and temporary displacement from construction and operation activities. Project activities may also temporarily deter wildlife from using portions of the biological study area. However, direct impacts would occur only during active construction within the project's physical ground disturbance footprint (right-of-way area for the proposed rail improvements). Table 2.3-1 shows habitat type and amount of area affected.

Table 2.3-1 Project Impacts to Vegetation Communities

Habitat Type	Total Area Affected in Biological Study Area Acres	Temporary Impacts to Project Footprint (right-of-way) Acres	Permanent Impacts to Project Footprint (right-of-way) Acres
Blue Oak Woodland	(60.3 ac)	(2.5 ac)	(0.5 ac)
Disturbed Blue Oak Woodland	(74.1 ac)	(0.2 ac)	(0.9 ac)
Central Coast Cottonwood-Sycamore Riparian Forest	(21.3 ac)	(0.5 ac)	(0.3 ac)
Foothill Pine-Oak Woodland	(16.6 ac)	(0 ac)	(0 ac)
Disturbed Foothill Pine-Oak Woodland	(65 ac)	(3.2 ac)	(3.2 ac)
Mojave Mixed Woody Scrub	(69.2 ac)	(8.2 ac)	(13.5 ac)
Mule Fat Scrub	(0.3 ac)	(0.1 ac)	(0 ac)
Non-native Grassland	(354.8 ac)	(18.3 ac)	(11.1 ac)
Sandy Wash	(18.8 ac)	(0.1 ac)	(0.1 ac)
Sierra-Tehachapi Saltbush Scrub	(60.5 ac)	(2.2 ac)	(4.4 ac)
Southern Alluvial Fan Scrub	(125.5 ac)	(2.9 ac)	(2.5 ac)
Disturbed Southern Alluvial Fan Scrub	(29.9 ac)	(0 ac)	(0 ac)
Sycamore Alluvial Woodland	(202 ac)	(0 ac)	(0.1 ac)
Developed	(91.9 ac)	(9.4 ac)	(15.6 ac)
Disturbed	(85 ac)	(11.1 ac)	(11.6 ac)
Approximate Total	(1,075.4 ac)	(58.6 ac)	(63.5 ac)

Short-term adverse impacts of the project would not be considered substantial given that wildlife currently using the biological study area and foraging in these areas would be used to human activity (e.g., high levels of rail and automobile traffic and ongoing maintenance activities).

The project's footprint lacks suitable habitat that would typically support special-status species or their habitats, or receive state and federal Endangered Species Act protections. Consequently, there is no reasonable presumption of adverse impact to any state or federal protected species or its habitat as a result of project implementation. The project is not expected to result in a trend toward additional state or federal listings; additional biological resource protection; apparent changes in habitat availability for common or special-status species; loss of habitat viability for any common and special-status species. Nor would it adversely affect annual production of biological resources or substantially change migration and foraging patterns for common and special-status species.

No-Build Alternative

This alternative would not affect biological resources because no activities would occur. Biological resources within the biological study area would experience no direct or indirect effects.

Avoidance, Minimization, and/or Mitigation Measures

Construction and Operational Impacts

No special-status species currently use the project's footprint, but portions of the biological study area could support biological resources during certain times of the year under appropriate circumstances.

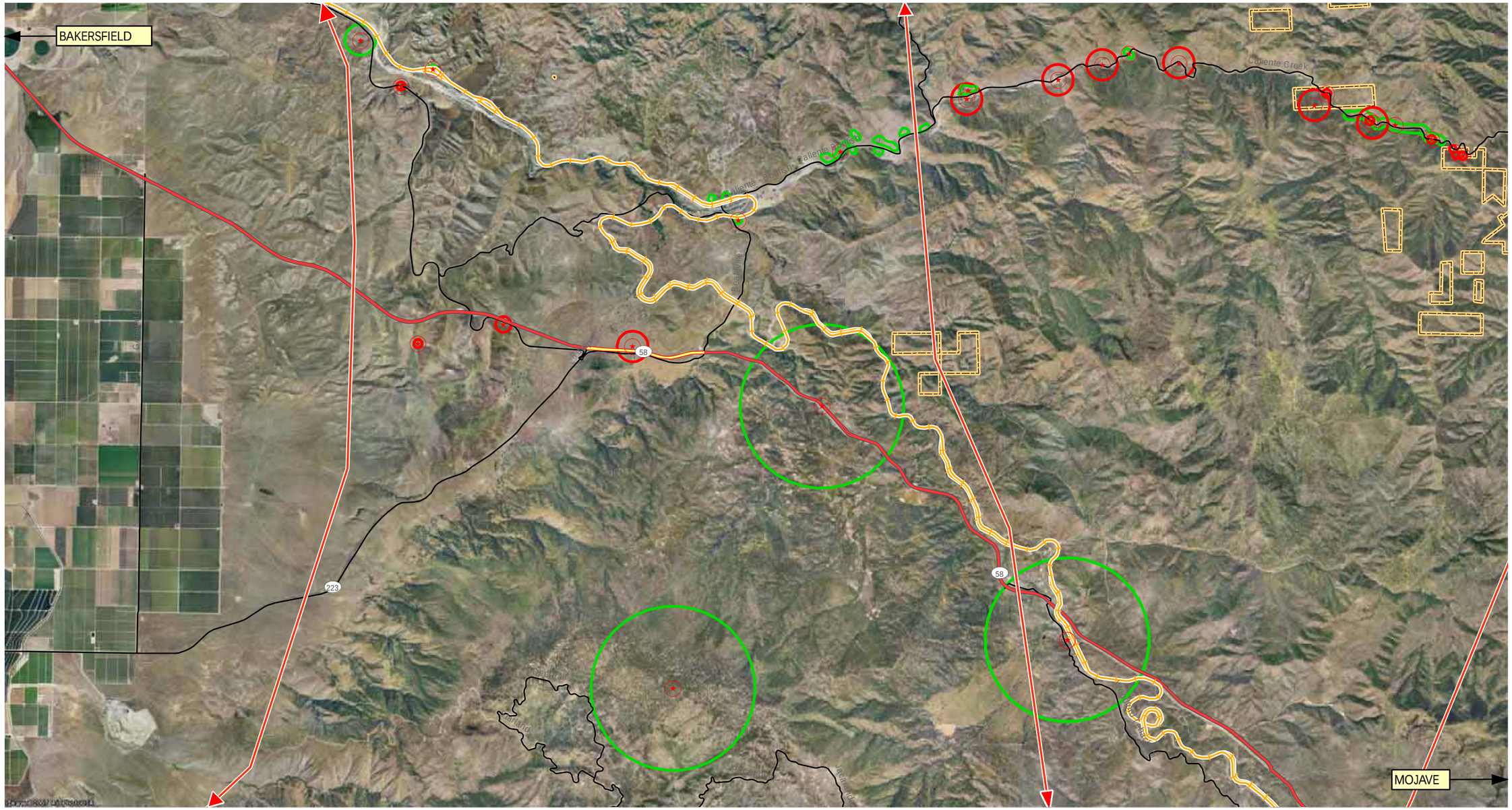
Minimization Measures

The following measures would avoid and minimize adverse impacts to natural community resources that may occur during project implementation:

- To avoid attracting predators and nuisance species during project construction, BNSF Railway and its contractor shall ensure that the project area, including limits of construction, is clear of debris. All food-related trash items shall be enclosed in sealed containers and regularly removed.
- Before ground-disturbing activities, BNSF Railway and its contractor shall stake, flag, fence or otherwise conspicuously demarcate in the field all environmentally sensitive areas that are to be protected in place and remain undisturbed during

construction. Environmentally sensitive areas include wetland, riparian habitat, oak woodlands, aquatic habitat, and any raptor or nesting bird locations identified before ground-disturbing activities. Construction materials used to demarcate environmentally sensitive areas would be removed no later than 30 days following physical completion of construction.

- Before ground-disturbing activities, BNSF Railway shall develop and implement an environmental education program for employees and contractors working in the biological study area during project construction.
- Before ground-disturbing activities, BNSF Railway shall develop and implement a Native Vegetation Restoration and Monitoring Plan that is consistent with the re-vegetation strategies described under the Visual Resources Impact Analysis for temporarily disturbed areas within the biological study area (e.g., staging areas and access roads). The final plan shall be prepared and submitted before construction to the Caltrans District 6 Environmental Division/Biology Branch Chief for “in concept” approval. The restoration and monitoring plan shall be implemented by BNSF Railway after construction activities have been completed.



Legend

- Streams/Rivers
- Water Bodies

Road Classification

- Limited Access
- Highways
- Secondary Roads
- Railroads

Sensitive Species

- Sensitive Species Locations *
- Migration Linkages **
- Plant Species Possible Range *
- Animal Species Possible Range *

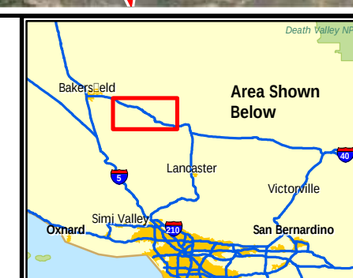
Jurisdictional Lands

- Bureau of Land Management

* Obtained from US FWO - Ventura, CA
As of April 2007

** Obtained from the November 2000 conference hosted by the California Wilderness Coalition, et al.

0 1.2 2.4 Miles



BNSF/UPRR Mojave Subdivision Tehachapi Rail Improvement Project

Tehachapi Pass
Potential Areas of Biological Resources

July 2010	Figure 2.3-1

Sources: Digital Globe Aerial Map 2007

2.3.2 Wetlands and Other Waters

Suspected special aquatic resource areas were examined within and adjacent to the project's physical disturbance footprint. Areas suspected of being special aquatic resource areas were evaluated during field surveys. During these surveys, ancillary plant and wildlife data were also recorded for all species detected within and adjacent to the project's footprint including, but not limited to, upland- and riparian-dependent wildlife species, and raptors. Field survey methods are explained in the Jurisdictional Determination Report prepared for the project.

Regulatory Setting

Wetlands and other waters are protected under a number of laws and regulations. At the federal level, the Clean Water Act (33 USC 1344) is the primary law regulating wetlands and surface waters. The Clean Water Act regulates the discharge of dredged or fill material into waters of the United States, including wetlands. Waters of the United States include navigable waters, interstate waters, territorial seas and other waters that may be used in interstate or foreign commerce. To classify wetlands for the purposes of the Clean Water Act, a three-parameter approach is used that includes the presence of: hydrophytic (water-loving) vegetation, wetland hydrology, and hydric soils (soils formed during saturation/inundation). All three parameters must be present, under normal circumstances, for an area to be designated as a jurisdictional wetland under the Clean Water Act.

Section 404 of the Clean Water Act establishes a regulatory program that provides that discharge of dredged or fill material cannot be permitted if a practicable alternative exists that is less damaging to the aquatic environment or if the nation's waters would be significantly degraded. The Section 404 permit program is run by the U.S. Army Corps of Engineers with oversight by the Environmental Protection Agency (EPA).

The Executive Order for the Protection of Wetlands (Executive Order 11990) also regulates the activities of federal agencies with regard to wetlands. Essentially, this executive order states that a federal agency, such as the Federal Highway Administration, cannot undertake or provide assistance for new construction located in wetlands unless the head of the agency finds: 1) that there is no practicable alternative to the construction and 2) the proposed project includes all practicable measures to minimize harm.

At the state level, wetlands and waters are regulated primarily by the California Department of Fish and Game, the State Water Resources Control Board and the

Regional Water Quality Control Boards. In certain circumstances, the Coastal Commission (or Bay Conservation and Development Commission or Tahoe Regional Planning Agency) may also be involved. Sections 1600-1607 of the California Fish and Game Code require any agency that proposes a project that will substantially divert or obstruct the natural flow of or substantially change the bed or bank of a river, stream, or lake to notify the California Department of Fish and Game before beginning construction. If the California Department of Fish and Game determines that the project may substantially and adversely affect fish or wildlife resources, a Lake or Streambed Alteration Agreement will be required. California Department of Fish and Game jurisdictional limits are usually defined by the tops of the stream or lake banks, or the outer edge of riparian vegetation, whichever is wider. Wetlands under jurisdiction of the Army Corps of Engineers may or may not be included in the area covered by a Streambed Alteration Agreement obtained from the California Department of Fish and Game.

The Regional Water Quality Control Boards were established under the Porter-Cologne Water Quality Control Act to oversee water quality. The Regional Water Quality Control Boards also issue water quality certifications in compliance with Section 401 of the Clean Water Act. Please see the Water Quality section for additional details.

Affected Environment

The biological study area includes portions of the Middle Kern-Upper Tehachapi-Grapevine and Tulare-Buena Vista Lakes Watersheds. A total of 55 features were found in the biological study area. For the purpose of this section, these features have been identified as “Feature 1” through “Feature 55” and are described in Table 2.3-2. (Complete details for all features are provided in the Jurisdictional Determination Report.)

None of the 55 features cross state lines or are considered Waters of the U.S. because they are not Traditional Navigable Waters or tributaries to Traditional Navigable Waters, nor do they have a significant nexus to Traditional Navigable Waters. Consequently, none of the 55 features within the study area is subject to Clean Water Act Section 404 jurisdiction.

However, the Regional Water Quality Control Board regulates fills to Waters of the U.S and Waters of the State through the Clean Water Act Section 401 water quality certification program and through the Porter-Cologne Water Quality Control Act, respectively. Consequently, a total of 20 features are likely subject to Regional Water

Quality Control Board legal authority and California Fish and Game Code Section 1600 et seq. jurisdiction, and are described in Table 2.3-2. These include Features 17-24, 27-28, 32, 39-41, 45, and 47-51. A total of 14 of the 20 features would be temporarily and/or permanently affected by project implementation; six features would be entirely avoided. The maps to the 14 features temporarily and/or permanently affected are provided in the Jurisdictional Determination Report, Appendix C (Jurisdictional Delineation Maps).

Table 2.3-2 Water Features Potentially Affected and Likely Subject to Regional Water Quality Control Board Authority

Feature No.	Feature Description	Temporary Impacts (acres)	Permanent Impacts (acres)
17	Feature 17 is a riparian-vegetated drainage that possesses attributes of a natural waterway. It is a named, blue line drainage identified as Tweedy Creek on the Keene United States Geological Survey 7.5 minute topographic quadrangle map. This drainage receives ephemeral flows from Feature 18 through a 48-inch culvert outfall and directs them west into Feature 19. Feature 17 includes an average 108-foot-wide riparian corridor and an average 8-foot-wide bed. Dominant vegetation includes an overstory of riparian species including mule fat, western sycamore, and shining wouldow, as well as an understory of soft chess, red brome, ripgut brome, cheat, and Mediterranean barley. CDFG jurisdiction pursuant to Section 1600 *et seq*. of the CFG Code extends to Feature 17 because it exhibits attributes of a natural waterway and contains habitat for fish and wildlife.	0.04	0.10
18	Feature 18 is an emergent, riparian-vegetated drainage that possesses attributes of a natural waterway. This feature is the farthest upstream portion of Tweedy Creek within the study area, which courses through Features 17, 19, and 20. Feature 18 collects ephemeral flows and directs them west through a culvert into Feature 17. This drainage has an average 8-foot-wide bank and 6-foot-wide bed with dominant vegetation consisting of low-density, riparian species including Freemont's cottonwood, shining wouldow and mule fat – with annual grasses including Mediterranean barley, ripgut brome and red brome. CDFG jurisdiction pursuant to Section 1600 *et seq*. of the CFG Code extends to Feature 18 because it exhibits attributes of a natural waterway and contains habitat for fish and wildlife.	0	0
19	Feature 19 is an upland-vegetated drainage exhibiting attributes of a natural waterway. This drainage is a portion of Tweedy Creek downslope of Features 17 and 18 and directs ephemeral flow through a 10-foot culvert infall into Feature 20. It exhibits a 3-foot-wide bed and bank with dominant vegetation including red brome, ripgut, and short-pod mustard. CDFG jurisdiction pursuant to Section 1600 *et seq*. of the CFG Code extends to Feature 19 because it exhibits attributes of a natural waterway and contains habitat for fish and wildlife.	<0.01	0.01
20	Feature 20 is a riparian-vegetated drainage that possesses the typical attributes of a natural waterway. It is the most downstream portion of Tweedy Creek that passes through the study area. This drainage receives ephemeral flow from Feature 19 through a 10-foot culvert outfall and eventually discharges into Tehachapi Creek beyond the study area. The average bed width ranges from 20 feet at the culvert outfall to 12 feet beyond the culvert; included riparian vegetation extends out 105 feet. Riparian vegetation is dominated by an upper canopy of western sycamore and shining wouldow and an understory of mule fat and young shining wouldow. The herbaceous layer consists of Mediterranean	0	0

Feature No.	Feature Description	Temporary Impacts (acres)	Permanent Impacts (acres)
	barley, ripgut brome, storksbill and red brome. CDFG jurisdiction pursuant to Section 1600 *et seq*. of the CFG Code extends to Feature 20 because it exhibits attributes of a natural waterway and contains habitat for fish and wildlife.		
21	Feature 21 is a hydrophytic-vegetated drainage that includes a defined bed and bank and possesses the attributes of a natural waterway. This feature collects localized ephemeral flow from upslope runoff and discharges flow into Feature 22 downstream through a 24-inch culvert. It contains a 7-foot-wide bed and bank within the study area. There are no riparian species associated with this feature; vegetation is dominated by annual hydrophytic species including curly dock, blue grass, and salt heliotrope. CDFG jurisdiction pursuant to Section 1600 *et seq*. of the CFG Code extends to Feature 21 because it exhibits attributes of a natural waterway and contains habitat for fish and wildlife.	0.01	0.01
22	Feature 22 is an upland-vegetated drainage that possesses the attributes of a natural waterway. This feature collects localized ephemeral flow from Feature 21 and discharges into Tweedy Creek beyond the study area. It contains a 2-foot-wide bed and bank within the study area. There are no riparian species associated with this feature; dominant vegetation includes red brome, ripgut brome, and soft chess brome. CDFG jurisdiction pursuant to Section 1600 *et seq*. of the CFG Code extends to Feature 22 because it exhibits attributes of a natural waterway and contains habitat for fish and wildlife.	0	0
23	Feature 23 is an upland-vegetated drainage that possesses the attributes of a natural waterway. This feature collects localized ephemeral flow from upslope runoff and directs it northeasterly within an 18-inch culvert through the study area. This feature discharges into Tweedy Creek beyond the study area and contains a well-defined 2-foot-wide bed and bank. There are no riparian species associated with this feature; dominant vegetation includes wild oats, soft chess, red brome, and Italian annual ryegrass. CDFG jurisdiction pursuant to Section 1600 *et seq*. of the CFG Code extends to Feature 23 because it is an artificially constructed drainage that exhibits attributes of a natural waterway and contains potential habitat for fish and wildlife.	0	0.01
24	Feature 24, Tehachapi Creek, is a riparian-vegetated drainage that possesses the typical attributes of a natural waterway. This drainage is identified as blue line intermittent stream and contained flowing water on the day of the survey (April 22, 2008). It flows northeast through the study area and eventually discharges into Caliente Creek. The average bed width is 28 feet and the average bank width is 91 feet. It contains riparian vegetation concentrated in the upslope portion of the feature, which consists of an open upper canopy of Freemont's cottonwood and an understory of wouldow and mule fat. The herbaceous layer consists of a mix of non-to-hydrophytic plants including pineapple weed, Mediterranean barley, oats, Baltic Rush, ripgut brome, and mugwort. CDFG jurisdiction pursuant to Section 1600 *et seq*. of the CFG Code extends to Feature 24 because it exhibits attributes of a natural waterway and contains habitat for fish and wildlife.	0.21	0.14
27	Feature 27, Caliente Creek, is an intermittent stream that possesses the attributes of a natural waterway and is identified as an intermittent blue line stream on the United States Geological Survey 7.5 Minute Oiler Peak quadrangle map. This drainage flows from east to west within the study area. The bed of this feature averages 24 feet and the bank width averages 78 feet on the downslope. Feature 27 is predominantly vegetated with nonnative (i.e., Mediterranean barley, ripgut brome, oats and red brome) within the understory and contains adjacent riparian vegetation including a dominance of non-native tamarisk as well as native western sycamore and Freemont's cottonwood along the upper flood terrace. CDFG jurisdiction pursuant to Section 1600 *et seq*. of the CFG Code extends to Feature 27 because it exhibits attributes of a natural waterway and contains habitat for fish and wildlife.	0.43	0.09
28	Feature 28, Tehachapi Creek, is an intermittent stream that possesses the attributes of a natural waterway and is identified as an intermittent blue line	0.17	0.02

Feature No.	Feature Description	Temporary Impacts (acres)	Permanent Impacts (acres)
	drainage on the United States Geological Survey 7.5 Minute Bena Quadrangle map. This drainage flows from south to north along the shoulder of Bealville Road within the study area. The bed of this drainage averages 15 feet and the bank width averages 23 feet. Feature 28 contained flowing water during the study area visit (April, 2008) and exhibits riparian vegetation including non-native tamarisk as well as native western sycamore, Freemont's cottonwood and mulefat. CDFG jurisdiction pursuant to Section 1600 *et seq*. of the CFG Code extends to Feature 28 because it exhibits attributes of a natural waterway and contains habitat for fish and wildlife.		
32	Feature 32 is a deeply incised, upland-vegetated drainage that possesses the attributes of a natural waterway. This drainage receives ephemeral surface water flows from localized upslope runoff from Feature 35 and drains downslope through a culvert under Caliente Bodfish Road into Caliente Creek. It exhibits a 5-foot-wide bed and bank within the study area. Dominant vegetation includes wild oats, upland grasses, bladderpod, and blue oak. CDFG jurisdiction pursuant to Section 1600 *et seq*. of the CFG Code extends to Feature 32 because it exhibits attributes of a natural waterway and contains habitat for fish and wildlife.	0.05	0.01
39	Feature 39 is an intermittent stream that possesses the attributes of a natural waterway and is identified as an unnamed blue line drainage on the United States Geological Survey 7.5 minute Bena quadrangle map. This drainage collects flows from Feature 40 through a 48-inch concrete box culvert outfall and directs them east into Caliente Creek. Feature 39 contained flowing water during the study area visit (April, 2008) and contains an non-vegetated 4-foot bed and 8-foot bank width with included riparian vegetation including mature Freemont's cottonwood, wouldow, and valley oak. CDFG jurisdiction pursuant to Section 1600 *et seq*. of the CFG Code extends to Feature 39 because it is an artificially produced feature that exhibits attributes of a natural waterway containing habitat for fish and wildlife.	0.12	0.23
40	Feature 40 is an intermittent stream that possesses the attributes of a natural waterway. It drains west through a 48-inch concrete box culvert infall into Feature 39. Feature 40 contained flowing water at the time of the survey and exhibits a 2-foot bed width with dense riparian woodland. The riparian woodland extends along the eastern side of the railroad track within the drainage and includes a closed canopy of mature Freemont's cottonwood and wouldow. CDFG jurisdiction pursuant to Section 1600 *et seq*. of the CFG Code extends to Feature 40 because it is an artificially produced feature that exhibits attributes of a natural waterway containing habitat for fish and wildlife.	0	0
41	Feature 41 is an emergent seep marsh extending in an east-west direction along the southern edge of the railroad and is contiguous with Feature 40, which possesses the attributes of a natural waterway. Ground water was present during the study area visit, and seeps out of the railroad cut and into a depression that parallels the railroad. Soils observed within a soil pit contained a dark, depleted matrix from 0-8 inches, indicating hydric soils as a result of long-term water ponding. Feature 41 also supports riparian vegetation including shining wouldow and mule fat, as well as emergent marsh species including American bulrush and dagger-leaved rush. This feature contains no defined bed, bank, or channel within the study area; however, it is subject to CDFG jurisdiction pursuant to Section 1600 *et seq*. of the CFG because it contains habitat for fish and wildlife and is adjacent to, and contiguous with, a drainage that exhibits attributes of a natural waterway containing habitat for fish and wildlife.	0.20	0
45	Feature 45, Caliente Creek, is a sparsely vegetated, intermittent stream that possesses the attributes of a natural waterway. This drainage flows in a southwest direction under the railroad and Bena Road. Feature 45 contains an average bed width of 55 feet and bank width of 180 feet, and contains sparse red brome and scale-broom. It is characterized by well-drained, nonhydric soils. CDFG jurisdiction pursuant to Section 1600 *et seq*. of the CFG Code extends to	0.05	0.20

Feature No.	Feature Description	Temporary Impacts (acres)	Permanent Impacts (acres)
	Feature 45 because it exhibits attributes of a natural waterway and contains habitat for fish and wildlife.		
47	Feature 47 is a riparian-vegetated feature within a topographic low along the upper bank terrace of Caliente Creek, which possesses the attributes of a natural waterway. This feature is located on a riparian-vegetated bank terrace along Caliente Creek, which contains a well-defined bed and bank. Feature 47 contains an open canopy of mature riparian cottonwood vegetation extending beyond the channel bank in association with the main creek channel. CDFG jurisdiction pursuant to Section 1600 *et seq*. of the CFG Code extends to Feature 47 because it is directly adjacent to Caliente Creek, which exhibits attributes of a natural waterway and contains habitat for fish and wildlife.	0	0
48	Feature 48 is a riparian-vegetated intermittent stream that possesses the attributes of a natural waterway. This drainage is a side channel of Caliente Creek that flows west and parallel to the railroad and Bena Road. Feature 48 contains a 12-foot bed and bank width, and contains an open canopy of low density cottonwood trees lining the majority of its length with scattered Tamarisk and wouldows. CDFG jurisdiction pursuant to Section 1600 *et seq*. of the CFG Code extends to Feature 48 because it exhibits attributes of a natural waterway and contains habitat for fish and wildlife.	0	0
49	Feature 49 is a riparian-vegetated intermittent stream that possesses the attributes of a natural waterway. This drainage generally flows northwest and parallel to the study area and contains an open canopy of low density cottonwood, wouldow, and mule fat, which lines the majority of the length of the channel. Caliente Creek contains a defined bed and bank that averages 75 feet at the intersection of the creek and the railroad bridge. CDFG jurisdiction pursuant to Section 1600 *et seq*. of the CFG Code extends to Features 49 because it exhibits attributes of a natural waterway and contains habitat for fish and wildlife.	0.04	0.08
50	Feature 50 is an upland-vegetated ephemeral drainage that possesses the attributes of a natural waterway. This drainage exhibits a 15-foot bed and bank width that drains northwest before ending in a topographic low area. There are no riparian species present within, or associated with, this feature; dominant vegetation includes red brome, Mediterranean barley, storksbill, and short-pod mustard. However, CDFG jurisdiction pursuant to Section 1600 *et seq*. of the CFG Code extends to Feature 50 because it exhibits attributes of a natural waterway and contains habitat for fish and wildlife.	0	0
51	Feature 51 is a riparian-vegetated intermittent stream that possesses the attributes of a natural waterway. This drainage generally flows northwest and parallel to the study area and contains an open canopy of low density cottonwood, wouldow, and mule fat, which lines the majority of the length of the channel. Caliente Creek contains a defined bed and bank that averages 75 feet at the intersection of the creek and the railroad bridge. CDFG jurisdiction pursuant to Section 1600 *et seq*. of the CFG Code extends to Features 51 because it exhibits attributes of a natural waterway and contains habitat for fish and wildlife.	1.16	0.6
TOTALS		2.48	1.5

Environmental Consequences

Build Alternative

Construction and Operational Impacts

Combined temporary impacts to the 20 features under Regional Water Quality Control Board jurisdiction total no more than 2.5 acres; permanent impacts total no more than 1.5 acres. The temporary impacts consist of native riparian habitat and non-riparian bed/bank. Impacts to each feature are shown in Table 2.3-2.

No-Build Alternative

This alternative would not affect special aquatic resource areas because no activities would occur. Special aquatic resource areas within the biological study area would experience no direct or indirect effects.

Avoidance, Minimization, and/or Mitigation Measures

Construction and Operational Impacts

Minimization Measures

For those areas in the project construction area that may support biological resources, the following avoidance and minimization activities would be implemented.

- Before beginning grading activities, BNSF Railway shall consult with the Regional Water Quality Control Board, U.S. Army Corps of Engineers, and the California Department of Fish and Game to verify the extent of impacts that project construction would have on wetlands resources.
- BNSF Railway shall obtain all necessary permits required by the identified agencies before construction.

2.4 Cumulative Impacts

A record search was done with the Kern County Planning Department in September 2009. No planned development projects within 5 miles of the project segment were identified.

Regulatory Setting

Cumulative impacts are those that result from past, present, and reasonably foreseeable future actions, combined with the potential impacts of this project. A cumulative effect assessment looks at the collective impacts posed by individual land use plans and projects. Cumulative impacts can result from individually minor, but collectively substantial impacts taking place over a period of time.

Cumulative impacts to resources in the project area may result from residential, commercial, industrial, and highway development, as well as from agricultural development and the conversion to more intensive types of agricultural cultivation. These land use activities can degrade habitat and species diversity through consequences such as displacement and fragmentation of habitats and populations, alteration of hydrology, contamination, erosion, sedimentation, disruption of migration corridors, changes in water quality, and introduction or promotion of predators. They can also contribute to potential community impacts identified for the project, such as changes in community character, traffic patterns, housing availability, and employment.

CEQA Guidelines, Section 15130, describes when a cumulative impact analysis is warranted and what elements are necessary for an adequate discussion of cumulative impacts. The definition of cumulative impacts, under CEQA, can be found in Section 15355 of the CEQA Guidelines. A definition of cumulative impacts, under NEPA, can be found in 40 CFR, Section 1508.7 of the CEQ Regulations.

Human Environment

The main cumulative impacts to the physical environment for the project include those associated with air quality, climate change, and noise and vibration. The following sections describe any cumulative impacts identified for all physical environment resources.

Air Quality

Construction Impacts

There are no other identified construction projects similar in duration or scope to that of the proposed project. Since the construction emissions of the project would not exceed the Kern County Air Pollution Control District and San Joaquin Valley Air Pollution Control District annual thresholds for the identified criteria pollutants, the emissions resulting from projects and other activities in the vicinity of the proposed project would not exceed the San Joaquin and Kern County Air Pollution Control District thresholds for critieria pollutants.

Operational Impacts

The cumulative emissions from the operation of the trains in the project area and within the vicinity of the project would not exceed the San Joaquin Valley Air Pollution Control District annual thresholds for Volatile Organic Compounds, Nitrogen Oxide and Particulate Matter under 10 microns Nor would the operational emissions exceed the Kern County Air Pollution Control District annual thresholds for Volatile Organic

Compounds, Nitrogen Oxide, Sulfur Dioxide and Particulate Matter under 10 microns. While the implementation of the project would increase the future sustainable capacity of the existing railway, the operational emissions from the project and other activities in the vicinity of the project would be lower than the no-build scenario due to improvements in locomotive technology and standards and use of more fuel-efficient rather than heavy-duty diesel trucks.

Climate Change

An individual project does not generate enough greenhouse gas emissions to significantly influence global climate change. Global climate change is a cumulative impact; a project participates in this potential impact through its incremental contribution combined with the cumulative increase of all other sources of greenhouse gases.

No other transportation projects have been planned within the vicinity of the proposed project. With the implementation of the proposed project, there would be a 46% reduction in greenhouse gas emissions compared to business as usual, a significant reduction exceeding the margins required to reduce the greenhouse gas emissions. Furthermore, the project is consistent with the California Air Resources Board Climate Change Scoping Plan Greenhouse Gas Emission Reduction Measure T-6 for reducing greenhouse gas emissions associated with the transport of goods.

Noise and Vibration

There are no other projects of similar size and scope in the vicinity of the project area. Since the project-related construction and other noise generators in the vicinity of the project would result in an increase of ambient noise up to 6 dBA, project-related construction presents an exceedance of the recommended 3-dBA increase under the California Environmental Quality Act. However, as long as construction activities take place during daytime hours (6:00 a.m. to 9:00 p.m.), noise from temporary construction activities would be exempt from the Kern County Noise Ordinance.

Physical Environment

The main cumulative impacts to the human environment include those associated with traffic and transportation/pedestrian and bicycle facilities, as discussed below.

Traffic and Transportation

During project construction, there would be incremental increases in traffic associated with construction activities (workers seeking temporary lodging quarters, shopping at local stores, and equipment and vehicle services). These traffic increases associated with

small specialized work crews would be minimal and are not anticipated to affect the existing traffic conditions near the project.

Indirect cumulative impacts would be experienced at selected road crossings in the City of Tehachapi.

During project operations, incremental increases in train lengths over existing conditions would occur as a result of the proposed project, resulting in slightly longer gate down times at four existing Union Pacific Railroad grade crossings in the City of Tehachapi (5 miles southeast of the project area): at Dennison Road, Hayes Street, Green Street, and Mill Street. A preliminary rail crossing delay analysis was done at the Dennison Road crossing to determine anticipated average vehicle delay times at all identified grade crossings (see Appendix F, Rail Crossing Delay Analysis).

For purposes of evaluating train delay impacts, a 7,000-foot train example was used at an existing gate down time of 4 minutes for one train crossing per hour on the existing single track. As a result of the proposed double-track project, gate down time would increase to 16 minutes with four train crossings per hour. The number of vehicles that would pass through the selected railroad grade crossings would about double by the year 2020; with construction of the proposed double-track project, the average wait time per vehicle at the grade crossings would also increase. The resulting average vehicle delay during the peak hour would increase from 8 seconds per vehicle (equivalent to Level of Service A) for one train crossing per hour to 31 seconds per vehicle (equivalent to Level of Service C) for four trains per hour. The following chart summarizes the example scenarios.

Table 2.4-1 Train Delay Impact Scenarios

	Trains per Hour	Vehicle Delay During Peak Hour (in seconds)	Level of Service
Existing Conditions (2010)	1	8	A
Project Conditions (2020)	4	31	C

The anticipated incremental delays caused by increased vehicular traffic and gate down time would not result in exceeding the acceptable Level of Service standard established by Kern County. The Kern County General Plan has designated Level of Service “D” as the minimum acceptable standard for the trains. At this Level of Service, the flow of vehicular traffic would not be affected by the operation of the trains. Based on the

acceptable Level of Service results associated with the various train lengths and frequency, no substantial significant indirect impact would occur as a result of the Build Alternative.

2.5 Climate Change

Regulatory Setting

While climate change has been a concern since at least 1988, as evidenced by the establishment of the United Nations and World Meteorological Organization's Intergovernmental Panel on Climate Change (IPCC), the efforts devoted to greenhouse gas emissions reduction and climate change research and policy have increased dramatically in recent years. These efforts are primarily concerned with the emissions of greenhouse gas related to human activity that include carbon dioxide (CO_2), methane, nitrous oxide, tetrafluoromethane, hexafluoroethane, sulfur hexafluoride, HFC-23 (fluoroform), HFC-134a (1, 1, 1, 2 –tetrafluoroethane), and HFC-152a (difluoroethane).

In 2002, with the passage of Assembly Bill 1493 (AB 1493), California launched an innovative and proactive approach to dealing with greenhouse gas emissions and climate change at the state level. Assembly Bill 1493 requires the California Air Resources Board (CARB) to develop and implement regulations to reduce automobile and light truck greenhouse gas emissions. These stricter emissions standards were designed to apply to automobiles and light trucks beginning with the 2009-model year; however, in order to enact the standards California needed a waiver from the U.S. Environmental Protection Agency (EPA). The waiver was denied by EPA in December 2007. See California v. Environmental Protection Agency, 9th Cir. Jul. 25, 2008, No. 08-70011. However, on January 26, 2009, it was announced that EPA will reconsider their decision regarding the denial of California's waiver. On May 18, 2009, President Obama announced the enactment of a 35.5 mpg fuel economy standard for automobiles and light duty trucks which will take effect in 2012. On June 30, 2009 EPA granted California the waiver. California is expected to enforce its standards for 2009 to 2011 and then look to the federal government to implement equivalent standards for 2012 to 2016. The granting of the waiver will also allow California to implement even stronger standards in the future. The state is expected to start developing new standards for the post-2016 model years later this year.

On June 1, 2005, Governor Arnold Schwarzenegger signed Executive Order S-3-05. The goal of this Executive Order is to reduce California's greenhouse gas emissions to: 1) 2000 levels by 2010, 2) 1990 levels by the 2020 and 3) 80% below the 1990 levels by the

year 2050. In 2006, this goal was further reinforced with the passage of Assembly Bill 32 (AB 32), the Global Warming Solutions Act of 2006. AB 32 sets the same overall greenhouse gas emissions reduction goals while further mandating that the California Air Resources Board create a plan, which includes market mechanisms, and implement rules to achieve "real, quantifiable, cost-effective reductions of greenhouse gases. Executive Order S-20-06 further directs state agencies to begin implementing AB 32, including the recommendations made by the state's Climate Action Team.

With Executive Order S-01-07, Governor Schwarzenegger set forth the low carbon fuel standard for California. Under this executive order, the carbon intensity of California's transportation fuels is to be reduced by at least 10% by 2020.

Climate change and greenhouse gas reduction is also a concern at the federal level; however, at this time, no legislation or regulations have been enacted specifically addressing greenhouse gas emissions reductions and climate change. California, in conjunction with several environmental organizations and several other states, sued to force the U.S. Environmental Protection Agency (EPA) to regulate greenhouse gas as a pollutant under the Clean Air Act (Massachusetts vs. Environmental Protection Agency et al., 549 U.S. 497 (2007). The court ruled that greenhouse gas does fit within the Clean Air Act's definition of a pollutant, and that the EPA does have the authority to regulate greenhouse gas. Despite the Supreme Court ruling, there are no promulgated federal regulations to date limiting greenhouse gas emissions.

On December 7, 2009, the EPA Administrator signed two distinct findings regarding greenhouse gases under section 202(a) of the Clean Air Act:

- Endangerment Finding: The Administrator finds that the current and projected concentrations of the six key well-mixed greenhouse gases--carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride (SF_6)--in the atmosphere threaten the public health and welfare of current and future generations.

- Cause or Contribute Finding: The Administrator finds that the combined emissions of these well-mixed greenhouse gases from new motor vehicles and new motor vehicle engines contribute to the greenhouse gas pollution which threatens public health and welfare.

These findings do not themselves impose any requirements on industry or other entities. However, this action is a prerequisite to finalizing the EPA's proposed greenhouse gas emission standards for light-duty vehicles, which were jointly proposed by EPA and the Department of Transportation's National Highway Safety Administration on September 15, 2009. [1]

According to *Recommendations by the Association of Environmental Professionals on How to Analyze GHG Emissions and Global Climate change in CEQA Documents* (Hendrix and Wilson, March 2007), an individual project does not generate enough greenhouse gas emissions to significantly influence global climate change. Rather, global climate change is a cumulative impact. This means that a project may participate in a potential impact through its incremental contribution combined with the contributions of all other sources of greenhouse gas. In assessing cumulative impacts, it must be determined if a project's incremental effect is "cumulatively considerable." See CEQA Guidelines sections 15064(i)(1) and 15130. To make this determination the incremental impacts of the project must be compared with the effects of past, current, and probable future projects. To gather sufficient information on a global scale of all past, current, and future projects in order to make this determination is a difficult if not impossible task.

As part of its supporting documentation for the Draft Scoping Plan, the California Air Resources Board recently released an updated version of the greenhouse gas inventory for California (June 26, 2008). Shown below is a graph from that update that shows the total greenhouse gas emissions for California for 1990, 2002-2004 average, and 2020 projected if no action is taken.

[1] http://www.epa.gov/climatechange/endangerment.html

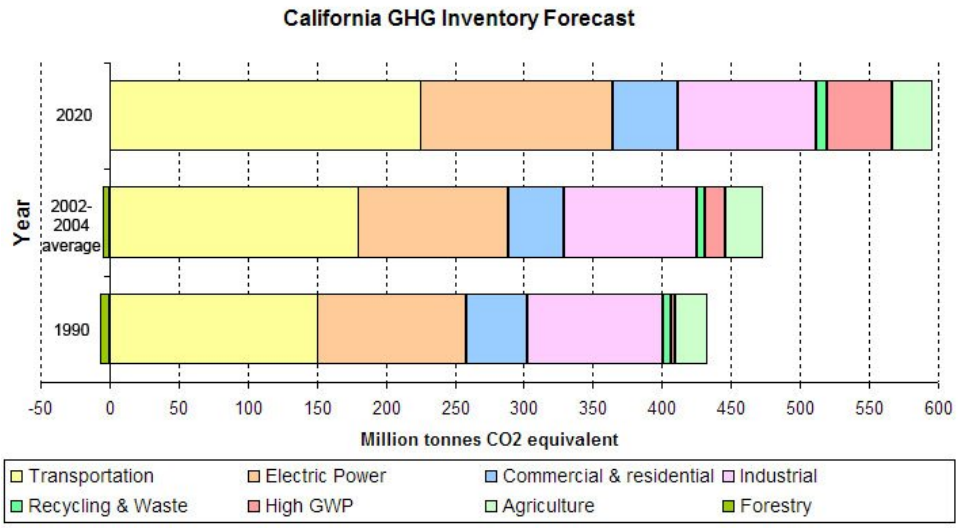


Figure 2.5-1 California GREENHOUSE GAS Inventory

Source: http://www.arb.ca.gov/cc/inventory/data/forecast.htm

Caltrans and its parent agency, the Business, Transportation, and Housing Agency, have taken an active role in addressing greenhouse gas emission reduction and climate change. Recognizing that 98% of California's greenhouse gas emissions are from the burning of fossil fuels and 40% of all human made greenhouse gas emissions are from transportation (see Climate Action Program at Caltrans (December 2006), Caltrans has created and is implementing the Climate Action Program at Caltrans that was published in December 2006. This document can be found at: http://www.dot.ca.gov/docs/ClimateReport.pdf

Because there have been more requirements set forth in California legislation and executive orders regarding climate change, the issue is addressed herein primarily under CEQA and that discussion may be used to inform the NEPA decision as well. The four strategies set forth by the Federal Highway Administration to lessen climate change impacts do correlate with efforts that the State has undertaken and is undertaking to deal with transportation and climate change; the strategies include improved transportation system efficiency, cleaner fuels, cleaner vehicles, and reduction in the growth of vehicle hours travelled.

Although the State has yet to formalize greenhouse gas regulations for the goods movement sector, the San Joaquin Valley Air Pollution Control District (SJVAPCD) has begun work in this area. For discussion purposes, the San Joaquin Valley Air Pollution

Control District draft guidance thresholds are referenced. The San Joaquin Valley Air Pollution Control District Draft Climate Change Action Plan suggests that impacts to Global Climate Change are less than significant for transportation projects that achieve 29% greenhouse gas emission reductions compared to business as usual

The Department as CEQA lead agency is responsible for determining the significance of the project's environmental impacts, including climate change. The Department has not adopted San Joaquin Valley Air Pollution Control District thresholds and will use its own independent judgment in determining CEQA significance.

Environmental Consequences

Build Alternative

Construction Impacts

Even though no formal guidelines to analyze greenhouse gases from construction activities have been adopted, a summary of the estimated peak construction emissions is presented below in Table 2.5-1.

Table 2.5-1 Estimated Peak Construction Greenhouse Gas Emissions

Emissions	Greenhouse Gas (tons per year)
	CO_2e
San Joaquin Valley Air Pollution Control District Emissions	1,098.25
Kern County Air Pollution Control District Emissions	1,248.93
Total Project Construction Emissions	2,347.18

Operational Impacts

The San Joaquin Valley Air Pollution Control District *Draft Climate Change Action Plan* suggests that impacts to Global Climate Change would be less than significant for transportation projects that achieve 29% greenhouse gas emission reductions compared to business as usual. Results from the 2020 business as usual (no project) and 2020 project operational greenhouse gas emissions are presented below in Table 2.5-2.

Table 2.5-2 Operational Greenhouse Gas Emissions

	Greenhouse Gases (tons per year)			
	Total CO_2e	CO_2	CH_4	N_2O
2020 Business as Usual	17,436	17,416.25	0.064	0.060
2020 with Project	9,436	9,336.66	0.82	0.27
Difference (Percentage)	-8,000 (-46%)			

The project would achieve a 46% greenhouse gas emissions reduction compared to business as usual. Therefore, under the San Joaquin Valley Air Pollution Control District's thresholds, the project's impacts to global climate change would be considered less than significant. Furthermore, the project is consistent with the California Air Resources Board Climate Change Scoping Plan Greenhouse Gas Emission Reduction Measure T-6 for reducing greenhouse gas emissions associated with the transport of goods.

No-Build Alternative

Construction and Operational Impacts

Greenhouse gas emissions for transportation projects can be divided into those produced during construction and those produced during operations. Construction greenhouse gas emissions include emissions produced as a result of material processing, emissions produced by onsite construction equipment, and emissions arising from traffic delays due to construction. These emissions will be produced at different levels throughout the construction phase; their frequency and occurrence can be reduced through innovations in plans and specifications and by implementing better traffic management during construction phases. In addition, with innovations such as longer pavement lives, improved traffic management plans, and changes in materials, the greenhouse gas emissions produced during construction can be mitigated to some degree by longer intervals between maintenance and rehabilitation events.

CEQA Conclusion

While construction may result in a slight increase in greenhouse gas emissions during construction, it is anticipated that any increase in greenhouse gas emissions due to construction will be offset by the improvement in operational greenhouse gas emissions. While it is Caltrans' determination that in the absence of further regulatory or scientific information related to greenhouse gas emissions and CEQA significance, it is too

speculative to make a significance determination regarding the project's direct impact and its contribution on the cumulative scale to climate change, Caltrans is firmly committed to implementing measures to help reduce greenhouse gas emissions. These measures are outlined in the following section.

AB 32 Compliance

Caltrans continues to be actively involved on the Governor's Climate Action Team as the California Air Resources Board works to implement the Governor's Executive Orders and help achieve the targets set forth in AB 32. Many of the strategies Caltrans is using to help meet the targets in AB 32 come from the California Strategic Growth Plan, which is updated each year. Governor Arnold Schwarzenegger's Strategic Growth Plan calls for a $238.6 billion infrastructure improvement program to fortify the state's transportation system, education, housing, and waterways, including $100.7 billion in transportation funding through 2016[2]. As shown in Figure 2.5-2, the Strategic Growth Plan targets a significant decrease in traffic congestion below today's level and a corresponding reduction in greenhouse gas emissions. The Strategic Growth Plan proposes to do this while accommodating growth in population and the economy. A suite of investment options has been created that combined together yield the promised reduction in congestion. The Strategic Growth Plan relies on a complete systems approach of a variety of strategies: system monitoring and evaluation, maintenance and preservation, smart land use and demand management, and operational improvements.

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[2] 2 Governor's Strategic Growth Plan, Fig. 1 (http://gov.ca.gov/pdf/gov/CSGP.pdf)

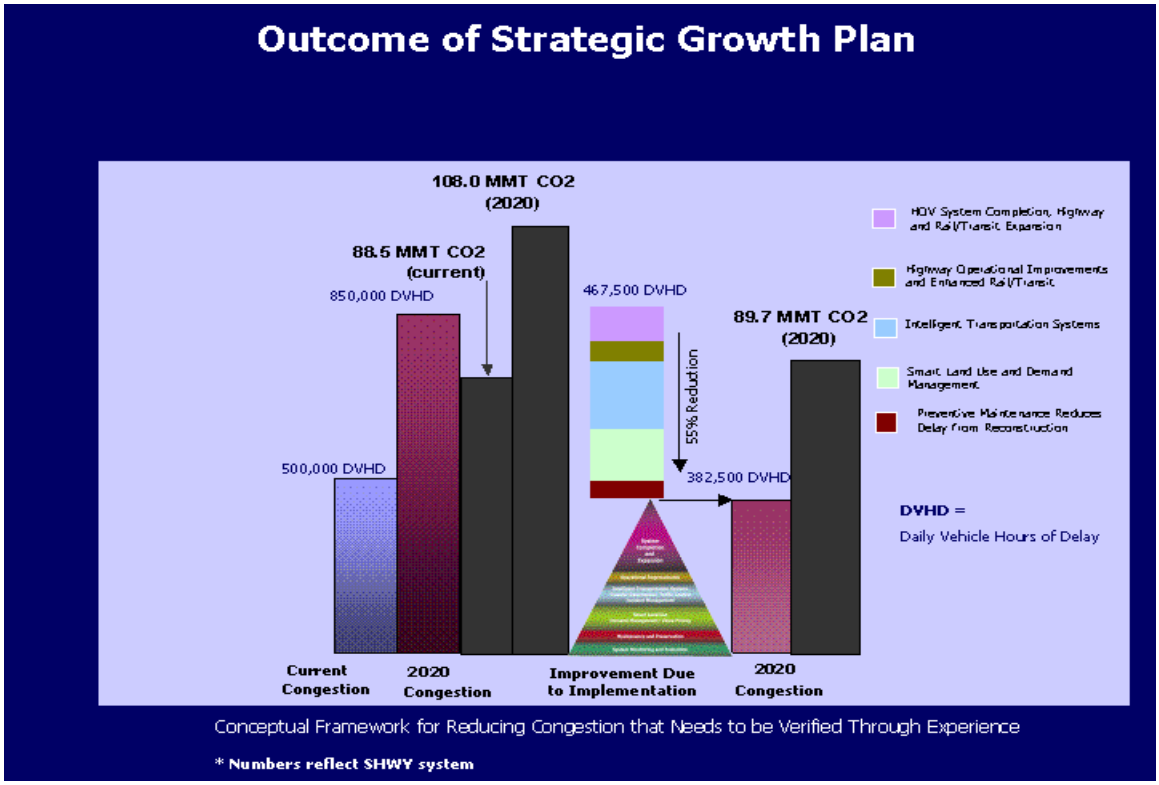

Figure 2.5-2 Outcome of Strategic Growth Plan

As part of the Climate Action Program at Caltrans (December 2006, http://www.dot.ca.gov/docs/ClimateReport.pdf), Caltrans is supporting efforts to reduce vehicle miles traveled by planning and implementing smart land use strategies: job/housing proximity, developing transit-oriented communities, and high density housing along transit corridors. Caltrans is working closely with local jurisdictions on planning activities; however, Caltrans does not have local land use planning authority. Caltrans is also supporting efforts to improve the energy efficiency of the transportation sector by increasing vehicle fuel economy in new cars, light and heavy-duty trucks; Caltrans is doing this by supporting ongoing research efforts at universities, by supporting legislative efforts to increase fuel economy, and by its participation on the Climate Action Team. It is important to note, however, that the control of the fuel economy standards is held by EPA and the California Air Resources Board. Lastly, the use of alternative fuels is also being considered; the Department is participating in funding for alternative fuel research at the University of California at Davis.

The next table summarizes the Department and statewide efforts that Caltrans is implementing in order to reduce greenhouse gas emissions. For more detailed information about each strategy, please see Climate Action Program at Caltrans (December 2006); it is available at http://www.dot.ca.gov/docs/ClimateReport.pdf.

Table 2.5-3 Cimate Change Strategies

Strategy	Program	Partnership		Method/Process	Estimated CO_2 Savings (MMT)	
		Lead	Agency		2010	2020
Smart Land Use	Intergovernmental Review (IGR)	Caltrans	Local Governments	Review and seek to mitigate development proposals	Not Estimated	Not Estimated
	Planning Grants	Caltrans	Local and regional agencies & other stakeholders	Competitive selection process	Not Estimated	Not Estimated
	Regional Plans and Blueprint Planning	Regional Agencies	Caltrans	Regional plans and application process	0.975	7.8
Operational Improvements & Intelligent Trans. System (ITS) Deployment	Strategic Growth Plan	Caltrans	Regions	State ITS; Congestion Management Plan	.007	2.17
Mainstream Energy & GHG into Plans and Projects	Office of Policy Analysis & Research; Division of Environmental Analysis	Interdepartmental effort		Policy establishment, guidelines, technical assistance	Not Estimated	Not Estimated
Educational & Information Program	Office of Policy Analysis & Research	Interdepartmental, CalEPA, CARB, CEC		Analytical report, data collection, publication, workshops, outreach	Not Estimated	Not Estimated
Fleet Greening & Fuel Diversification	Division of Equipment	Department of General Services		Fleet Replacement B20 B100	0.0045	0.0065 0.45 .0225
Non-vehicular Conservation Measures	Energy Conservation Program	Green Action Team		Energy Conservation Opportunities	0.117	.34
Portland Cement	Office of Rigid Pavement	Cement and Construction Industries		2.5 % limestone cement mix 25% fly ash cement mix > 50% fly ash/slag mix	1.2 .36	3.6
Goods Movement	Office of Goods Movement	Cal EPA, CARB, BT&H, MPOs		Goods Movement Action Plan	Not Estimated	Not Estimated
Total					2.72	18.67

According to Caltrans Standard Specification Provisions, idling time for lane closure during construction is restricted to 10 minutes in each direction; in addition, the contractor must comply with San Joaquin Valley Air Pollution Control District and the Kern County Air Pollution Control District rules, ordinances, and regulations in regards to air quality restrictions.

Adaptation Strategies

"Adaptation strategies" refer to how Caltrans and others can plan for the effects of climate change on the state's transportation infrastructure and strengthen or protect the facilities from damage. Climate change is expected to produce increased variability in precipitation, rising temperatures, rising sea levels, storm surges and intensity, and the frequency and intensity of wildfires. These changes may affect the transportation infrastructure in various ways, such as damaging roadbeds by longer periods of intense heat; increasing storm damage from flooding and erosion; and inundation from rising sea levels.

These effects will vary by location and may, in the most extreme cases, require that a facility be relocated or redesigned. There may also be economic and strategic ramifications as a result of these types of impacts to the transportation infrastructure.

Climate change adaption must also involve the natural environment as well. Efforts are underway on a statewide-level to develop strategies to cope with impacts to habitat and biodiversity through planning and conservation. The results of these efforts will help California agencies plan and implement mitigation strategies for programs and projects.

On November 14, 2008, Governor Schwarzenegger signed Executive Order S-13-08, which directed a number of state agencies to address California's vulnerability to sea level rise caused by climate change.

The California Resources Agency [now the Natural Resources Agency, (Resources Agency)], through the interagency Climate Action Team, was directed to coordinate with local, regional, state and federal public and private entities to develop a state Climate Adaptation Strategy. The Climate Adaptation Strategy will summarize the best known science on climate change impacts to California, assess California's vulnerability to the identified impacts and then outline solutions that can be implemented within and across state agencies to promote resiliency.

As part of its development of the Climate Adaptation Strategy, Resources Agency was directed to request the National Academy of Science to prepare a Sea Level Rise Assessment Report by December 2010 to advise how California should plan for future sea level rise. The report is to include:

- relative sea level rise projections for California, taking into account coastal erosion rates, tidal impacts, El Niño and La Niña events, storm surge and land subsidence rates
- range of uncertainty in selected sea level rise projections
- synthesis of existing information on projected sea level rise impacts to state infrastructure (such as roads, public facilities and beaches), natural areas, and coastal and marine ecosystems
- discussion of future research needs regarding sea level rise for California

Furthermore Executive Order S-13-08 directed the Business, Transportation, and Housing Agency to prepare a report to assess vulnerability of transportation systems to sea level affecting safety, maintenance and operational improvements of the system and economy of the state. Caltrans continues to work on assessing the transportation system vulnerability to climate change, including the effect of sea level rise.

Prior to the release of the final Sea Level Rise Assessment Report, all state agencies that are planning to construct projects in areas vulnerable to future sea level rise were directed to consider a range of sea level rise scenarios for the years 2050 and 2100 in order to assess project vulnerability and, to the extent feasible, reduce expected risks and increase resiliency to sea level rise. However, all projects that have filed a Notice of Preparation, and/or are programmed for construction funding the next five years (through 2013), or are routine maintenance projects as of the date of Executive Order S-13-08 may, but are not required to, consider these planning guidelines.

Sea level rise estimates should also be used in conjunction with information regarding local uplift and subsidence, coastal erosion rates, predicted higher high water levels, storm surge and storm wave data. (Executive Order S-13-08 allows some exceptions to this planning requirement.)

Climate change adaptation for transportation infrastructure involves long-term planning and risk management to address vulnerabilities in the transportation system from increased precipitation and flooding; the increased frequency and intensity of storms and wildfires; rising temperatures; and rising sea levels. Caltrans is an active participant in the efforts being conducted as part of Governor Schwarzenegger's Executive Order on Sea Level Rise and is mobilizing to be able to respond to the National Academy of Science report on Sea Level Rise Assessment, which is due to be released by December 2010.

On August 3, 2009, the Natural Resources Agency in cooperation and partnership with multiple state agencies, released the 2009 California Climate Adaptation Strategy Discussion Draft, which summarizes the best known science on climate change impacts in seven specific sectors and provides recommendations on how to manage against those threats. The release of the draft document set in motion a 45-day public comment period. Led by the California Natural Resources Agency, numerous other state agencies were involved in the creation of discussion draft, including: Environmental Protection; Business, Transportation and Housing; Health and Human Services; and the Department of Agriculture.

The discussion draft focuses on sectors that include: Public Health; Biodiversity and Habitat; Ocean and Coastal Resources; Water Management; Agriculture; Forestry; and Transportation and Energy Infrastructure. The strategy is in direct response to Governor Schwarzenegger's November 2008 Executive Order S-13-08 that specifically asked the Natural Resources Agency to identify how state agencies can respond to rising temperatures, changing precipitation patterns, sea level rise, and extreme natural events.

As data continues to be developed and collected, the state's adaptation strategy will be updated to reflect current findings. A revised version of the report was posted on the Natural Resource Agency website on December 2, 2009; it can be viewed at: http://www.energy.ca.gov/2009publications/CNRA-1000-2009-027/CNRA-1000-2009-027-F.PDF.

Currently, Caltrans is working to assess which transportation facilities are at greatest risk from climate change effects. However, without statewide planning scenarios for relative sea level rise and other climate change impacts, Caltrans has not been able to determine what change, if any, may be made to its design standards for its transportation facilities.

Once statewide planning scenarios become available, the Caltrans will be able review its current design standards to determine what changes, if any, may be warranted in order to protect the transportation system from sea level rise.

Chapter 3 Comments and Coordination

Early and continuing coordination with the general public and appropriate public agencies is an essential part of the environmental process to determine the scope of environmental documentation, the level of analysis, potential impacts and mitigation measures, and related environmental requirements. Agency consultation and public participation for this project have been accomplished through a variety of formal and informal methods, including project development team meetings, interagency coordination meetings, and correspondence exchange.

This chapter summarizes the results of Caltrans' efforts to identify, address, and resolve project-related issues through early and continuing coordination.

Approach to Environmental Documentation

Multi-agency and multi-jurisdictional planning efforts have led to the choice of this Mitigated Negative Declaration as the appropriate level of CEQA document for the addition of a second track along five segments of the Tehachapi Rail Corridor.

Since the beginning of the initial scoping period in mid-2008, a diverse group of stakeholders, including the two railroads and the Department of Transportation, have been involved in multiple bi-weekly coordination meetings and discipline-specific environmental issues discussions with Caltrans District 6 and the railroad's representative during January, May, and August of 2009. In collaboration with the Department of Transportation, consensus with each of the stakeholders was made while disclosing to the decision-makers and the public the potential significant impacts of the proposed activities and ways to avoid or reduce the significant impacts to a less than significant level through the use of alternative and mitigation measures that are feasible.

Frequent communication with the project development team, alignment of project goals with agency objectives, and active exploration of environmental solutions to minimize environmental impacts were some of the planning efforts that were undertaken to ensure production of an informative, defensible environmentally sensitive document.

Stakeholders Coordination

The Tehachapi Rail Improvement Project is a public-private partnership project that would add capacity to a congested and constrained railroad corridor serving the

Central Valley and San Francisco Bay Region. The project is developed with extensive guidance and support from a multi-jurisdictional team of federal, state, regional local and private sector stakeholders. The main stakeholders of this environmental documentation process include the Department of Transportation's Division of Rail and District 6 environmental staffs, the Union Pacific Railroad, the BNSF Railway, the County of Kern, and the City of Tehachapi.

Consultation and agency review of the environmental document also involved the Kern County and San Joaquin Air Pollution Control Districts, the Central Valley Water Quality Control Board, the State Historic Preservation Office, the California Department of Fish and Game, and other affected local and tribal groups or persons.

The Department of Transportation would perform with the Division of Rail serving its current contract management role and District 6 serving as the Lead Agency. Two railroads—the Union Pacific Railroad and the BNSF Railway—are actively involved in this project as the facility owner and the project developer/applicant.

California Department of Fish and Game

Consultation was initiated with the California Department of Fish and Game, involving personal communication with local resource experts, research of management plans and other relevant materials to determine the locations and types of biological resources.

In addition, field surveys to target plant, wildlife, and riparian bird species protected under the state and federally Endangered Species Acts (ESA) were in accordance with the standardized guidelines issued by the California Department of Fish and Game.

Native American Heritage Commission

The California Native American Heritage Commission was contacted so it could identify any sites in the immediate project area that are considered Sacred Lands. A records search of the Sacred Land Files, sent by the California Native American Heritage Commission, was received on March 27, 2008.

The Native American Heritage Commission provided a list of six Native American individuals and organizations. Letters and maps were sent to these individuals on April 4, 2008 to inform them of the project, to inquire if they knew of any unrecorded Native American cultural resources, and to solicit comments, questions, or concerns with regard to the project. Each letter was tracked, using certified mail, and delivery

was confirmed. Attempts were made to contact the letter recipients via telephone to confirm that they did not have input regarding the project; phone messages were left, and no responses have been received to date.

State Historic Preservation Officer

No federal nexus had been identified. As such, no consultation with State Historic Preservation Officer is required.

Kern County Planning Department

Correspondence with the planning, engineering, and hydrology departments at Kern County occurred on August 11, 2009. The county provided the Keene Ranch Community Plan, Keene Rural Specific Plan, and other relevant Geographic Information System files on the Keene and Caliente areas. Also obtained or examined were hydrologic records, historic bridge maps, and additional engineering maps for construction of the bridges at mile posts 335.94, 330, and 328.21.

A record search for the planned development projects within 5 miles of the project area was conducted. No developments have been planned in the vicinity of the project area.

City of Tehachapi

A meeting with the City of Tehachapi representatives was held on October 13, 2009 to allay community concerns about indirect impacts for one of more grade crossings, in response to a letter to Caltrans District 6, on May 7, 2008. The meeting was constructive, and both sides left the meetings with an agreement to work together toward a mutually beneficial solution.

Chapter 4 List of Preparers

This Mitigated Negative Declaration was prepared by an interdisciplinary team of specialists from the Caltrans Division of Rail and Central Region, BNSF Railway, and Union Pacific Railroad. Caltrans Central Region staff members are listed below. Table 4.1 lists the Division of Rail, BNSF Railway, Union Pacific Railroad and consultant staff involved in the preparation of this document.

Christopher Brewer, Associate Environmental Planner (Architectural History). M.A., Public Administration, California State University, Bakersfield; 33 years of experience in California history, cultural resource management, and architectural history. Contribution: Historic Architecture Oversight.

Abdulrahim Chafi, Transportation Engineer. Ph.D., Environmental Engineering, California Coast University, Santa Ana; B.S., M.S., Chemistry and M.S., Civil/Environmental Engineering, California State University, Fresno; 14 years of environmental technical studies experience. Contribution: Noise and Air Quality Oversight.

David Farris, Associate Environmental Planner. B.S., Environmental Biology and Management, University of California at Davis, 10 years environmental planning experience. Contribution: Environmental Document Oversight.

Sarah Gassner, Chief, Southern Sierra Environmental Analysis Branch. B.A., Anthropology, California State University, Fresno; M.A., Cultural Resources Management, Sonoma State University; 14 years of archaeological experience; 9 years of cultural resource management and environmental planning experience with Caltrans. Contribution: Environmental Unit Supervisor.

David Lanner, Environmental Planner. B.F.A., Art, Utah State University; 14 years of cultural resources experience. Contribution: Cultural Resource Oversight.

Richard C. Stewart, Engineering Geologist, P.G. B.S., Geology, California State University, Fresno; 21 years of hazardous waste and water quality experience; 4 years of paleontology/geology experience. Contribution: Paleontology Oversight.

Juergen Vespermann, Senior Environmental Planner. Engineering Degree, Fachhochschule Muenster, Germany; 22 years of transportation planning/environmental planning. Contribution: Senior Hazardous Waste Oversight.

Charles Walbridge, Associate Environmental Planner. B.S., Biological Sciences, California State University, Fresno; 10 years of environmental planning experience. Contribution: Biology Oversight.

Table 4.1 List of Preparers

Roles	Responsibilities	
Caltrans Division of Rail— Sacramento, CA		
Rick Deming	Chief, Environmental Branch, Division of Rail (now retired)	
Brian Apper	Senior Quality Control Officer	
Henry Barnes	Associate Environmental Planner, Visual Resources	
Sam Wong	Principal Investigator, Hydrology lead	
BNSF Railway		
Walter Smith	Director of Public Projects	
David Seep	Director of Environmental Engineering and Program Development	
Colleen Weatherford	Director of Public and Private Partnership	
Thomas Schmidt	Director of Engineering Services	
David Miller	Engineering Manager	
Matt Graham	Manager of Environmental Remediation	
Dava Kaitala	General Counsel	
Russell Light	Senior General Counsel	
Mark Ostoich	President, Gresham Savage Nolan and Tilden- BNSF outside counsel	
Tracy Owens	Gresham Savage Nolan and Tilden- BNSF outside counsel	
Jennifer Guenther	Gresham Savage Nolan and Tilden- BNSF outside counsel	
Union Pacific Railroad		
Gary Bates	Director of Project Design	
James Diel	Manager, Environmental Site Remediation	
Dufey Exon	Manager Environmental Field Operations, Southern CA/Los Angeles Basin	
Patrick Prososki	UPRR Train Service, Engineering and Maintenance of Way	
Wayne Whitlock	Partner, Pillsbury Winthrop Shaw Pittman	
Daryoush Razavian	Vice President, Olsson Associates, Hydraulic Engineering	
Tom Dodson and Associates		
Tom Dodson	Third Party Environmental Document Advisor/Reviewer	
Lisa Tollstrup	Senior Biologist	
Roles	Responsibilities	Education
URS Corporation		

Roles	Responsibilities	
Brian Wynne	Principal-in-Charge	AA, Oceanographic Studies
Jeff Rice	Project Manager	MBA; BS, Urban and Regional Planning
Lucy Lin	Project Coordinator	MPl, Planning BS, Biology
Virginia Viado	Senior Environmental Planner	BS, Urban and Regional Planning
Mike Agbodo	Manager, Hydrology task lead	MS, Water Resources Engineering BS, Civil Engineering
Pallavi Pathak	Hydrologist	MS, Water Resources Engineering
Noel Casil	Transportation and Traffic Engineer	BS, Civil Engineering
Kim Castruita	Environmental Planner, Socioeconomics, Land Use and Recreation, Utilities and Public Services	BS, Urban Planning
Pei-Ming Chou	Environmental Planner, Cumulative Impacts, Farmlands	MA, Historic Preservation Planning BA, English Literature
Joe Devoy	Manager, Geographic Information System	BS, Mechanical Engineering Registered Civil Engineer in California
Cynthia Gabaldon	Senior Engineer, Hydrology and Water Quality	BS, Civil Engineering Registered Civil Engineer in California
Craig Woodman	Senior Project Manager, Cultural Resources	MA, Archaeology
Laurie Solis	Senior Archaeologist	MA, Archaeology
Dustin Kay	Archaeologist	BS, Anthropology
Jeremy Hollins	Senior Architectural Historian	MA, Architectural History
Raj Rangaraj	Senior Air Quality Scientist, QA/QC	MBA, Ph.D., Mechanical Engineering MS, Civil Engineering
Tammy Chavez	Air Quality Specialist	BS, Environmental Science
Ted Lindberg	Senior Acoustical Engineer	BA, Mathematics
Mark Storm	Senior Project Engineer/Noise Specialist	BS, Aeronautics & Astronautics
Lawrence Headley	Principal Visual Resources Specialist	MLA, Landscape Architecture BS, Communications
Leonard Malo	Manager, Natural Resources and Permitting	MS, Environmental Management
Lincoln Hulse	Senior Biologist	BS, Environmental Science/Wildlife Biology
Bill O'Braitis	Manager, Geo-Remediation	BS, Geology
Paul Peterson	Senior Reviewer, Geological and Hazardous Resources lead	BS, Geological Science
Jeff Muller	Senior Geologist, Hazards and Hazardous Materials	MS, Marine Science BS, Environmental Science
Chandra Puramsetty	Hazards and Hazardous Materials Specialist	MS, Environmental Studies

Roles	Responsibilities	
Joe Stewart	Principal Paleontological Resources Specialist	PhD, Systematics and Ecology
Mark Weisman	Independent Technical Reviewer/ Editor	MA, Geography
Diane Barrett	Senior Planner, Independent Technical Review	BA, Cultural Studies

Appendix A California Environmental Quality Act Checklist

This checklist identifies physical, biological, social and economic factors that might be affected by the proposed project. Where there is a need for clarifying discussion, the discussion is included either following the applicable section of the checklist or is within the body of the environmental document itself. The words "significant" and "significance" used throughout the following checklist are related to CEQA, not NEPA, impacts. The California Environmental Quality Act impact levels include “potentially significant impact,” “less than significant impact with mitigation,” “less than significant impact,” and “no impact.”

Supporting documentation of all California Environmental Quality Act checklist determinations is provided in Chapter 2 of this Initial Study/Environmental Assessment. Documentation of “No Impact” determinations is provided at the beginning of Chapter 2. Discussion of all impacts, avoidance, minimization, and/or mitigation measures is under the appropriate topic headings in Chapter 2. The questions in this form are intended to encourage the thoughtful assessment of impacts and do not represent thresholds of significance.

	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
I. AESTHETICS: Would the project:				
a) Have a substantial adverse effect on a scenic vista	☐	☐	☒	☐
b) Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway	☐	☐	☐	☒
c) Substantially degrade the existing visual character or quality of the site and its surroundings?	☐	☐	☐	☒
d) Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?	☐	☐	☐	☒

II. AGRICULTURE AND FOREST RESOURCES: In determining whether impacts to agricultural resources are significant environmental effects, lead agencies may refer to the California Agricultural Land Evaluation and Site Assessment Model (1997) prepared by the California Dept. of Conservation as an optional model to use in assessing impacts on agriculture and farmland. In determining whether impacts to forest resources, including timberland, are significant environmental effects, lead agencies may refer to information compiled by the California Department of Forestry and Fire Protection regarding the state’s inventory of forest land, including the Forest and Range Assessment Project and the Forest Legacy Assessment Project; and the forest carbon measurement methodology provided in Forest Protocols adopted by the California Air Resources Board. Would the project:

	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
a) Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use?	☐	☐	☒	☐
b) Conflict with existing zoning for agricultural use, or a Williamson Act contract?	☐	☐	☒	☐
c) Conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code section 12220(g)), timberland (as defined by Public Resources Code section 4526), or timberland zoned Timberland Production (as defined by Government Code section 51104(g))?	☐	☐	☒	☐
d) Result in the loss of forest land or conversion of forest land to non-forest use?	☐	☐	☐	☒
e) Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland, to non-agricultural use or conversion of forest land to non-forest use?	☐	☐	☐	☒
III. AIR QUALITY: Where available, the significance criteria established by the applicable air quality management or air pollution control district may be relied upon to make the following determinations. Would the project:				
a) Conflict with or obstruct implementation of the applicable air quality plan?	☐	☐	☒	☐
b) Violate any air quality standard or contribute substantially to an existing or projected air quality violation?	☐	☐	☒	☐
c) Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non- attainment under an applicable federal or state ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors)?	☐	☐	☒	☐
d) Expose sensitive receptors to substantial pollutant concentrations?	☐	☐	☐	☒
e) Create objectionable odors affecting a substantial number of people?	☐	☐	☐	☒
IV. BIOLOGICAL RESOURCES: Would the project:				
a) Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?	☐	☐	☒	☐

	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
b) Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations or by the California Department of Fish and Game or US Fish and Wildlife Service?	☐	☐	☒	☐
c) Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?	☐	☐	☒	☐
d) Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?	☐	☐	☒	☐
e) Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?	☐	☐	☒	☐
f) Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan?	☐	☐	☒	☐
V. CULTURAL RESOURCES: Would the project:				
a) Cause a substantial adverse change in the significance of a historical resource as defined in §15064.5?	☐	☒	☐	☐
b) Cause a substantial adverse change in the significance of an archaeological resource pursuant to §15064.5?	☐	☒	☐	☐
c) Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?	☐	☒	☐	☐
d) Disturb any human remains, including those interred outside of formal cemeteries?	☐	☒	☐	☐
VI. GEOLOGY AND SOILS: Would the project:				
a) Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving:	☐	☐	☐	☐
i) Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42?	☐	☐	☒	☐
ii) Strong seismic ground shaking?	☐	☐	☒	☐

	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
iii) Seismic-related ground failure, including liquefaction?	☐	☐	☒	☐
iv) Landslides?	☐	☐	☒	☐
b) Result in substantial soil erosion or the loss of topsoil?	☐	☐	☒	☐
c) Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction or collapse?	☐	☐	☒	☐
d) Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial risks to life or property?	☐	☐	☒	☐
e) Have soils incapable of adequately supporting the use of septic tanks or alternative waste water disposal systems where sewers are not available for the disposal of waste water?	☐	☐	☒	☐

VII. GREENHOUSE GAS EMISSIONS: Would the project:

a) Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment? b) Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases?	An assessment of the greenhouse gas emissions and climate change is included in the body of environmental document. While Caltrans has included this good faith effort in order to provide the public and decision-makers as much information as possible about the project, it is Caltrans determination that in the absence of further regulatory or scientific information related to GHG emissions and CEQA significance, it is too speculative to make a significance determination regarding the project's direct and indirect impact with respect to climate change. Caltrans does remain firmly committed to implementing measures to help reduce the potential effects of the project. These measures are outlined in the body of the environmental document.

VIII. HAZARDS AND HAZARDOUS MATERIALS: Would the project:

a) Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?	☐	☐	☒	☐
b) Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?	☐	☐	☒	☐
c) Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?	☐	☐	☐	☒

	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
d) Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?	☐	☐	☒	☐
e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project result in a safety hazard for people residing or working in the project area?	☐	☐	☐	☒
f) For a project within the vicinity of a private airstrip, would the project result in a safety hazard for people residing or working in the project area?	☐	☐	☐	☒
g) Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?	☐	☐	☒	☐
h) Expose people or structures to a significant risk of loss, injury or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands?	☐	☐	☒	☐

IX. HYDROLOGY AND WATER QUALITY: Would the project:

a) Violate any water quality standards or waste discharge requirements?	☐	☐	☒	☐
b) Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted)?	☐	☐	☒	☐
c) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner which would result in substantial erosion or siltation on- or off-site?	☐	☐	☒	☐
d) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site?	☐	☐	☒	☐
e) Create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff?	☐	☐	☒	☐
f) Otherwise substantially degrade water quality?	☐	☐	☒	☐

	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
g) Place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map?	☐	☐	☐	☒
h) Place within a 100-year flood hazard area structures which would impede or redirect flood flows?	☐	☐	☒	☐
i) Expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam?	☐	☐	☐	☒
j) Inundation by seiche, tsunami, or mudflow	☐	☐	☐	☒

X. LAND USE AND PLANNING: Would the project:

a) Physically divide an established community?	☐	☐	☐	☒
b)Conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project (including, but not limited to the general plan, specific plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect?	☐	☐	☒	☐
c) Conflict with any applicable habitat conservation plan or natural community conservation plan?	☐	☐	☒	☐

XI. MINERAL RESOURCES: Would the project:

a) 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?	☐	☐	☐	☒
b) 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?	☐	☐	☐	☒

XII. NOISE: Would the project result in:

a) Exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?	☐	☐	☒	☐
b) Exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels?	☐	☐	☒	☐
c) A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project?	☐	☐	☒	☐

	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
d) A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project?	☐	☒	☐	☐
e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?	☐	☐	☐	☒
f) For a project within the vicinity of a private airstrip, would the project expose people residing or working in the project area to excessive noise levels?	☐	☐	☐	☒
XIII. POPULATION AND HOUSING: Would the project:				
a) Induce substantial population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)?	☐	☐	☐	☒
b) Displace substantial numbers of existing housing, necessitating the construction of replacement housing elsewhere?	☐	☐	☐	☒
c) Displace substantial numbers of people, necessitating the construction of replacement housing elsewhere?	☐	☐	☐	☒
XIV. PUBLIC SERVICES:				
a) Would the project result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for any of the public services:	☐	☐	☒	☐
Fire protection?	☐	☐	☒	☐
Police protection?	☐	☐	☒	☐
Schools?	☐	☐	☐	☒
Parks?	☐	☐	☒	☐
Other public facilities?	☐	☐	☒	☐

	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
XV. RECREATION:				
a) Would the project increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?	☐	☐	☐	☒
b) Does the project include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment?	☐	☐	☐	☒
XVI. TRANSPORTATION/TRAFFIC: Would the project:				
a) Conflict with an applicable plan, ordinance or policy establishing measures of effectiveness for the performance of the circulation system, taking into account all modes of transportation including mass transit and non-motorized travel and relevant components of the circulation system, including but not limited to intersections, streets, highways and freeways, pedestrian and bicycle paths, and mass transit?	☐	☐	☒	☐
b) Conflict with an applicable congestion management program, including, but not limited to level of service standards and travel demand measures, or other standards established by the county congestion management agency for designated roads or highways?	☐	☐	☒	☐
c) Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks?	☐	☐	☐	☒
d) Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?	☐	☐	☐	☒
e) Result in inadequate emergency access?	☐	☐	☒	☐
f) Conflict with adopted policies, plans or programs regarding public transit, bicycle, or pedestrian facilities, or otherwise decrease the performance or safety of such facilities?	☐	☐	☐	☒
XVII. UTILITIES AND SERVICE SYSTEMS: Would the project:				
a) Exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board?	☐	☐	☐	☒
b) Require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?	☐	☐	☐	☒

	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
c) Require or result in the construction of new storm water drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?	☐	☐	☐	☒
d) Have sufficient water supplies available to serve the project from existing entitlements and resources, or are new or expanded entitlements needed?	☐	☐	☐	☒
e) Result in a determination by the wastewater treatment provider which serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments?	☐	☐	☐	☒
f) Be served by a landfill with sufficient permitted capacity to accommodate the project's solid waste disposal needs?	☐	☐	☐	☒
g) Comply with federal, state, and local statutes and regulations related to solid waste?	☐	☐	☐	☒

XVIII. MANDATORY FINDINGS OF SIGNIFICANCE

a) Does the project have the potential to degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, substantially reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory?	☐	☐	☒	☐
b) Does the project have impacts that are individually limited, but cumulatively considerable? ("Cumulatively considerable" means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects)?	☐	☐	☒	☐
c) Does the project have environmental effects which will cause substantial adverse effects on human beings, either directly or indirectly?	☐	☐	☐	☒

Appendix B Title VI Policy Statement

STATE OF CALIFORNIA—BUSINESS, TRANSPORTATION AND HOUSING AGENCY ARNOLD SCHWARZENEGGER, Governor

DEPARTMENT OF TRANSPORTATION
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Flex your power!
Be energy efficient!

August 25, 2009

TITLE VI
POLICY STATEMENT

The California State Department of Transportation under Title VI of the Civil Rights Act of 1964 and related statutes, ensures that no person in the State of California shall, on the grounds of race, color, national origin, sex, disability, or age, be excluded from participation in, be denied the benefits of, or be otherwise subjected to discrimination under any program or activity it administers.

RANDELL H. IWASAKI
Director

"Caltrans improves mobility across California"

Appendix C Minimization and/or Mitigation Summary

Table E.1 Mitigation Monitoring and Reporting Plan Summary

Impact Category	Avoidance, Minimization, and Mitigation Measures	Impact after Mitigation Measure	Implementation Timing	Designated Monitor	Method of Verification	Compliance Verification
Traffic and Transportation/ Pedestrian and Bicycle Facilities	BNSF Railway and its contractor shall obtain Construction-Related Road Closure permits from the County of Kern Roads Department when construction would affect local roadways and bridges, and alternative routes or detours at existing railroad crossings would be needed. The applicant would obtain related permits from the California Public Utilities Commission for improvements of the public grade crossing at Caliente to Bealville. A minimum of one open lane for traffic at two-lane roadways would be maintained if there are no options for detours at roadway crossing work zones.	N/A	During project construction, 5 working days prior to need for road closure/detour	BNSF Railway contractor and County of Kern Roads Department	Construction Related Road Closure Permit obtained	Issuance of Construction Related Road Closure Permit
	BNSF Railway and its contractor shall coordinate with Caltrans and the County of Kern Public Works Department to implement a public awareness campaign advising motorists and local residents on the dates of construction and details of potential road closures.	N/A	Prior to project grading	BNSF Railway contractor, Caltrans and County of Kern Roads Department	Notices prepared and posted	BNSF shall make copies available on request

	TRA-3. BNSF Railway and its contractor shall coordinate with the County of Kern Roads Department to provide advance warning signs in construction zones to mitigate conflicts between construction activities and vehicular traffic.	N/A	During project construction	BNSF Railway contractor and County of Kern Roads Department	Signs posted in construction zones	Inspection and verification by County and Caltrans staff
	BNSF Railway and its contractor shall provide flagmen to direct traffic at construction areas adjacent to public roadways to mitigate conflicts between construction activities and vehicular traffic, if warranted.	N/A	During project construction	BNSF Railway contractor and County of Kern Roads Department	Flagmen provided in construction zones	Inspection and verification by County and Caltrans staff
Cultural Resources	The boundaries of known archaeological sites, identified during the Phase I Archaeological Survey (BNSF TEMP 1-4), shall be identified by the project archaeologists prior to grading activities through wooden staking and fluorescent flagging tape so that these areas may easily be avoided during construction.	N/A	Prior to construction grading phase	BNSF Railway contractor and qualified archaeological monitor	Approval of the boundaries by qualified archaeological monitor from Caltrans	Inspection and verification by Caltrans staff

	In the event that human remains are encountered, BNSF Railway shall cease all construction in the area of the find and the remains would stay in-situ pending definition of an appropriate plan. State Health and Safety Code Section 7050.5 states that further disturbances and activities shall cease in any area or nearby area suspected to overlie remains, and the Kern County Coroner shall be contacted. Pursuant to Public Resources Code Section 5097.98, in the event the remains are Native American in origin, the Native American Heritage Commission would be contacted to determine necessary procedures for protection and preservation of the remains, including identifying the Most Likely Descendent for reburial, as provided in the State of California Environmental Quality Act Guidelines, Section 15064.5(e), "CEQA and Archaeological Resources," CEQA Technical Advisory Series. Caltrans District 6 Environmental Branch shall also be contacted so that it may work with the Most Likely Descendent on the respectful treatment and disposition of the remains. Further provisions of Public Resources Code Section 5097.98 are to be followed as applicable.	Less than Significant	During project grading, in the event human remains are discovered	BNSF Railway designated Environmental Site Manager	Environmental Site Manager to document discovery details and submit to Kern County Coroner and/or Native American Heritage Commission	Review and clearance information from Kern County Coroner and/or Native American Heritage Commission to be available at on-site construction office during construction activities

	A Cultural Resources Monitoring Plan, specifying the potential for types of resources and sites that may be encountered, shall be prepared by BNSF Railway and submitted to Caltrans for review and approval prior to monitoring. The implementation of the monitoring plan would help ensure rapid in-field evaluation and documentation to prevent construction hold-ups. In the event that any prehistoric or historic cultural resources (chipped or ground stone lithics, animal bone, ashy midden soil, structural remains, historic glass or ceramics, etc.) are discovered during the course of construction, all work in the vicinity shall halt, and the archaeologist would evaluate the significance of the find, and if significant, identify the proper course for mitigation.	Less than Significant	Prior to project grading	BNSF Railway designated Environmental Site Manager	Cultural Resources Monitoring Plan reviewed and approved by Caltrans	Copy of approved Cultural Resources Monitoring Plan available at on-site construction office during construction activities
	BNSF Railway shall retain the services of an archaeological monitor to be present during all ground-disturbing activities to ensure that potential significant impacts to unknown cultural resources shall be reduced to less than significant. Additional archaeological monitors may be required by Caltrans in certain areas where there is greater sensitivity to encounter resources. Additional monitors may include Native American monitors and/or additional archaeological personnel. Additional archaeological monitors shall be used on an as-needed basis and in conjunction with coordination efforts with Caltrans.	Less than Significant	Prior to and during project grading	BNSF Railway designated Environmental Site Manager	Contact information of Archeological, Native American and other necessary monitors submitted to Caltrans for review and approval	Copy of contact information for all monitors to be available at on-site construction office during construction activities

Hydrology	During construction, work within or over the floodways shall be scheduled by BNSF Railway to occur during the non-rainy season. Minor impacts to sediment buildup would occur during construction of the project. Measures would involve energy dissipation devices and best management practices to minimize sedimentation buildup and erosion.	N/A	Prior and during project Construction			
	Prior to construction, re-analysis of impacts to hydrologic flows should be prepared based on final bridge design and topographic conditions.	N/A	Prior to completion of the Final Design	BNSF Railway Design Division	Approval bridge plans by BNSF Railway and/or UPRR	Copy of approved bridge plans to be available at on-site construction office during construction activities
	A Letter of Map Revision (LOMR) application would need to be completed with Federal Emergency Management Agency to address the changes in flood elevation level on mile post 328.21. The boundaries of the affected area would be decided pending final design verifications.	N/A	Prior to completion of the Final Design	BNSF Railway Design Division	Approval LOMR application by BNSF Railway and/or UPRR and Federal Emergency Management Agency	Copy of approved LOMR application to be available at on-site construction office during construction activities
Water Quality	Grading and construction plans submitted by BNSF Railway shall meet requirements of the State Water Resources Control Board National Pollutant Discharge Elimination System Statewide General Permit for Storm Water Discharges Associated with Construction Activity Permit. (Currently Water Quality Order 99-08-WQ; as of July 2010: Order No. 2009- 0009 -DWQ (National Pollutant Discharge Elimination System No CAS000002 - revised September 2009).	N/A	Prior to construction/Final Design Phase	BNSF Railway Design Division	Approval of the plans by Caltrans and the County of Kern Public Works and Building Departments	Copy of the National Pollutant Discharge Elimination System General Permit to be available on-site

	BNSF Railway shall submit for review and approval to Caltrans and the County of Kern Public Works Department, a construction Stormwater Pollution Prevention Plan for the entire project. The Stormwater Pollution Prevention Plan shall be implemented throughout the duration of the project. (Currently Water Quality Order 99-08-WQ; As of July 2010: Order No. 2009- 0009 -DWQ (National Pollutant Discharge Elimination System No CAS000002 - Revised Sept. 2009).	N/A	Prior to construction or Final Design Phase	BNSF Railway Design Division	Approval of the plans by Caltrans and the County of Kern Public Works and Building Departments	Copy of the National Pollutant Discharge Elimination System General Permit to be available on-site
Geology/Soils	BNSF Railways shall improve stability of cut slopes identified by the project geotechnical engineers with structural elements like tiebacks or soil nails.	N/A	During final project design and prior to project grading	BNSF Railway Design Division	Approval of the Geotechnical Investigation Report by Caltrans and UPRR/BNSF	Copy of report to be made available on-site
	In the event that a landslide should affect the rail corridor, BNSF Railway shall stabilize landslides by remedial grading or other methods, if economically feasible.	N/A	During final design	BNSF Railway Design Division	Approval of the findings of the Geotechnical Investigation Report by Caltrans and UPRR/BNSF	Copy of report to be made available on-site
Paleontological Resources	Prior to project grading, BNSF Railway shall retain the services of a qualified paleontologist to prepare and certify a Paleontological Evaluation Report and Paleontological Mitigation Plan (PMP) for review and approval by Caltrans and the County of Kern prior to approval of grading plans. The individual(s) selected to prepare these documents shall meet the qualifications of a Principal Paleontologist, as established in the Caltrans Standard Environmental Reference.	Less than Significant	Prior to project grading	BNSF Railway designated Environmental Site Manager	Paleontological Evaluation Report and Paleontological Mitigation Plan (PMP) reviewed and approved by Caltrans and County of Kern	Copy of approved plans available at on-site construction office during construction activities

	Prior to project grading, BNSF Railway shall retain the services of a qualified paleontologist to oversee and implement a paleontological monitoring effort for this project during construction at sensitive paleontological areas.	Less than Significant	Prior to project grading	BNSF Railway designated Environmental Site Manager	Contact information of paleontologist submitted to Caltrans for review and approval	Copy of contact information for paleontologist to be available at on-site construction office during construction activities
Hazards, Hazardous Waste or Materials	Prior to beginning of construction activities, BNSF Railway shall retain the services of a blasting contractor licensed to use Class A explosives, and licensed as a contractor in the State of California, to conduct any blasting required for project construction. The contractor shall comply with all applicable regulations and standards established by the regulatory agencies, codes, and professional societies including the rules and regulations for storage, transportation, delivery, and use of explosives. Compliance with California Code of Regulations, Title 8 (Division of Occupational Safety and Health - Cal/OSHA).	Less than Significant	Prior to project grading	BNSF Railway designated Environmental Site Manager	Contact information of blasting contractor submitted to Caltrans for review and approval	Copy of contact information for blasting contractor to be available at on-site construction office during construction activities

	A blasting plan may be required by Caltrans or the County of Kern Building Department to address specific mitigation measures on a site/impact specific basis. A blasting plan is intended to help ensure worker safety, and protection of natural, historic and cultural resources. Elements of a Blasting Plan would include: Description of the procedures to be implemented to protect workers during blasting; Description of the procedures for proper storage and transportation of explosive materials; Prohibiting blasting during extreme fire danger periods; Description of the procedures to prevent impact to biological resources; Detail procedures to ensure that flyrock, air blast, and ground vibration are controlled; Procedures to protect existing facilities and utility lines; and Procedures for notifications to local residents and businesses nearby blast areas.	N/A	Prior to project construction	BNSF Railway blasting contractor	BNSF qualified blasting contractor and monitor	BNSF Railway contractor report to be available on request
Air Quality	BNSF Railway and its contractor shall monitor vehicular construction activities to ensure the speed on unpaved roads is maintained at less than 15 miles per hour.	N/A	During project construction	BNSF Railway contractor and designated Environmental Site Manager	BNSF Railway contractor daily inspection	BNSF Railway contractor report to be available on request
	BNSF Railway and its contractor shall monitor construction activities and manage haul road dust by watering 3 times per day.	N/A	During project construction	BNSF Railway contractor and designated Environmental Site Manager	BNSF Railway contractor daily inspection	BNSF Railway contractor report to be available on request

Noise	All noise-producing project equipment and vehicles using internal combustion engines shall be equipped with mufflers, air-inlet silencers where appropriate, and any other shrouds, shields, or other noise-reducing features in good operating condition that meet or exceed original factory specification. Mobile or fixed "package" equipment (e.g., arc-welders, air compressors) shall be equipped with shrouds and noise control features that are readily available for that type of equipment.	N/A	During project construction	BNSF Railway contractor and designated Environmental Site Manager	BNSF Railway contractor daily inspection	BNSF Railway contractor report to be available on request
	All project workers exposed to noise levels above 80 dBA shall be provided with personal protective equipment for hearing protection (i.e., earplugs and/or earmuffs); areas where noise levels are routinely expected to exceed 85 dBA shall be clearly posted with signs stating "Hearing Protection Required in this Area."	N/A	During project construction	BNSF Railway contractor and designated Environmental Site Manager	BNSF Railway contractor daily inspection	BNSF Railway contractor report to be available on request
	Prior to beginning daily construction activities and throughout project construction, BNSF Railway and its contractor shall ensure material stockpiles and mobile equipment staging, parking, and maintenance areas are located at least 500 feet away from noise-sensitive receptors.	N/A	During project construction	BNSF Railway contractor and designated Environmental Site Manager	BNSF Railway contractor daily inspection	BNSF Railway contractor report to be available on request
	During project construction, BNSF Railway and its contractor shall ensure workers operating construction vehicles on-site are not exceeding established construction vehicle speed limits of 15 miles per hour.	N/A	During project construction	BNSF Railway contractor and designated Environmental Site Manager	BNSF Railway contractor daily inspection	BNSF Railway contractor report to be available on request

	During project construction and operation, BNSF Railway and its contractor shall ensure the use of construction-related noise-producing signals, including horns, whistles, alarms, and bells, are used for safety warning purposes only.	N/A	During project construction	BNSF Railway contractor and designated Environmental Site Manager	BNSF Railway contractor daily inspection	BNSF Railway contractor report to be available on request
	During project construction, BNSF Railway and its contractor shall ensure that any construction-related or project-related public address or music systems used are not audible at any adjacent sensitive receptor.	N/A	During project construction	BNSF Railway contractor	BNSF Railway contractor daily inspection	BNSF Railway contractor report to be available on request
	During project construction, BNSF Railway and its on-site construction supervisor shall have the responsibility and authority to receive and resolve noise complaints. A clear appeal process for those filing noise complaints shall be established by BNSF Railway prior to construction commencement that would allow for resolution of noise problems that cannot be immediately solved by the site supervisor.	N/A	During project construction	BNSF Railway contractor	Copies of construction related noise complaints submitted to BNSF Railway contractor to be forwarded to Caltrans and County of Kern	BNSF Railway contractor report of response and resolution to be available on request

Biological Resources	Prior to ground-disturbing activities, BNSF Railway shall develop and implement an environmental education program for employees and contractors working in the biological study area during project construction.	N/A	Prior to project grading	BNSF Railway designated Environmental Site Manager	Environmental Education Program reviewed and approved by Caltrans and County of Kern	Copy of approved plans and list of those employees and contractors who have completed the environmental education program to be available at on-site construction office during construction activities
Biological Resources (continued)	Prior to ground-disturbing activities, BNSF Railway shall develop and implement a Native Vegetation Restoration and Monitoring Plan that is consistent with the re-vegetation strategies as described under the Visual Resources Impact Analysis for temporarily disturbed areas within the biological study area (e.g., staging areas and access roads). The final plan shall be prepared and submitted prior to construction to the Caltrans District 6 Environmental Division/Biology Branch Chief for 'in concept' approval. The restoration and monitoring plan shall be implemented by BNSF Railway after construction activities have been completed.	N/A	During project construction	BNSF Railway contractor and designated Environmental Site Manager	Native Vegetation Restoration and Monitoring Plan reviewed and approved by Caltrans	Copy of approved plan available at on-site construction office during construction activities

	Prior to undertaking ground-disturbing activities within the biological study area that may adversely affect oak woodlands, large individual oaks, or any other native tree species that are equal to or greater than 30 centimeters dbh; or affecting 15-meter-wide riparian vegetation corridors along streams and drainages, BNSF Railway shall coordinate with the Kern County Resource Management Agency to ensure that the project is consistent with any applicable local tree, shrub, plant, and drainage protection requirements.	N/A	Prior to project grading	BNSF Railway contractor and designated Environmental Site Manager	BNSF Railway shall identify native species trees on project grading plans and review with Kern County Resource Management Agency prior to approval	Documentation or review and approval from Kern County Resource Management Agency to be provided by BNSF Railway on request

Appendix D Preliminary Rail Crossing Delay Analysis

A preliminary rail crossing delay analysis was done at the Dennison Road and UPRR crossing in the City of Tehachapi using the model developed from the Southern California Regional Rail Authority and the California Public Utility Commission to determine vehicle delay at grade crossings in California. Traffic data used included existing 24-hour traffic counts and Kern Council of Government Year 2030 Traffic Model projections for the Greater Tehachapi Planning Area. There are no available traffic data at this time to evaluate the other three study crossing locations at Hayes, Green and Mill Street. All existing and future train movement data are consistent with the project description.

The following formulas were used in the delay study:

Total Gate Blockage Time

$$T_B = 0.603 + ((50 + l + w)/v)$$

Where:

T_B = total blockage time per train in minutes
l = length of train in feet
w = roadway width at crossing in feet
v = train speed in feet per second (assumed to be 45 mph or 66 fps)

The total gate blockage time formula uses several physical characteristics about the crossings, as well as train volumes, to determine blockage time.

Peak-Hour Vehicle Delay

To isolate the delay to vehicles incurred due to crossing blockage, the following formula was used:

$$\text{Delay} = (T_B^2)*(q/2)*(1-q/d))$$

Where:

Delay = Total minutes of vehicle delay
T_B = The length of time the crossing is blocked by the train
Q = Vehicle arrival rate, vehicles per minute
D = Vehicle departure rate, vehicles per minute (assumed to be 1,520 vphpl)

Note: The peak-hour vehicle delay is attributable to crossing blockage alone. It is not intended to be used additively with intersection performance characteristics.

Existing Grade Crossing Analysis

Existing train crossing delay was evaluated using available traffic data from the Greater Tehachapi Area Specific Plan Traffic Analysis document.

Table G.1 displays the existing peak hour vehicle delay conditions using various peak hour train frequency and train length scenarios.

Table G.1 Existing Grade Crossing Delay Analysis

Peak Hour Train Crossings	Existing Peak Hour Volume [1]	Delay (minutes per vehicle) [2]	Total Peak Hour Delay (minutes)
6,000-foot Trains [3]			
1 train per hour	110	0.04	4
5 trains per hour	110	0.20	22
7,000-foot Trains [3]			
1 train per hour	110	0.05	5
5 trains per hour	110	0.25	27

[1] Based on Greater Tehachapi Area Specific Plan Traffic Analysis (Urban Crossroads, July 2008)

[2] Delay per vehicle = Total Peak Hour Delay/Peak Hour Volume

[3] BNSF/UPRR projects an average of 48 6,000-foot trains and two 7,000-foot trains per hour operate on the Mojave Subdivision Tehachapi Pass (2009)

Year 2020 Grade Crossing Analysis

The year 2020 grade crossing delay was evaluated using traffic growth projections from the year 2030 Kern Council of Governments model. Since there were no interim year 2020 model projections, volumes assumed to be conservative were used in the analysis.

Table G.2 displays the year 2020 delay conditions using various peak hour train frequency and train length scenarios.

Table G.2 Year 2020 Grade Crossing Delay Analysis

Peak Hour Train Crossings	Year 2030 Peak Hour Volume [1]	Delay (minutes per vehicle) [2]	Total Peak Hour Delay (minutes)
7,000-foot Trains			
2 train per hour	214	0.10	22
5 trains per hour	214	0.26	55
8,000-foot Trains			
2 train per hour	214	0.13	27
5 trains per hour	214	N/A	N/A
[1] Based on Greater Tehachapi Area Circulation Study, Kern COG. [2] Delay per vehicle = Total Peak Hour Delay/Peak Hour Volume			

Preliminary Findings and Conclusions

Analysis was based on the conditions when one directional gate crossing is down. There is a potential for increased delay if there are no crossing overlaps of opposing double-track train traffic. However, due to the minimal vehicular traffic volume presented under existing and future conditions, the maximum delay (55 minutes) calculated, using a traffic volume of 214 vehicles at Dennison crossing and two 8,000-foot-long trains per hour crossing the UPRR line, is manageable in context to individual vehicles (0.26 minutes per vehicle) throughout the peak hour.

Appendix E List of Technical Studies

The following technical studies have been prepared for the project and are provided separately in the BNSF/UPRR Mojave Subdivision Tehachapi Rail Improvement Program Combined Technical Studies document associated with this Mitigated Negative Declaration:

- Aesthetics/Visual Resources Impact Assessment
- Air Quality Impact Analysis
- Noise Technical Report
- Hydrology, Hydraulics, and Floodplain Analysis
- Hazardous Materials Evaluation Analysis
- Geology Technical Report
- Historical Resources Compliance Report
- Archaeological Survey Report
- Historic Resource Evaluation Report
- Paleontological Identification Report
- Natural Environment Study-Minimal Impacts
- Jurisdictional Delineation Report