Chapter 1 Introduction

1.1 Purpose Of The Environmental Impact Report/Environmental Assessment

The California Department of Transportation (Caltrans) and federal Bureau of Indian Affairs (BIA) have prepared this Draft Environmental Impact Report (EIR)/Environmental Assessment (EA) to provide the public and interested public agencies with information about the potential environmental effects of the proposed Shingle Springs Interchange Project (Proposed Project). The Proposed Project consists of the construction, operation and maintenance of an interchange in El Dorado County, California to serve the existing Shingle Springs Rancheria **(Figures 1-1 and 1-2)**. The new interchange will provide open access to the Rancheria so that the property can be developed with uses consistent with the Tribe's Land Use Plan. The immediate plan for development on the Rancheria is a hotel and casino project that will be located in the southwestern portion of the Rancheria.

The respective roles, responsibilities, and interests of the BIA and Caltrans are very different. The BIA, is charged with assisting Native Americans to manage their own affairs and promoting self-determination and advancement under the trust relationship to United States. The BIA institutionalizes the United States of America's Trust relationship, personified by the Secretary of the Interior, with Native Americans. The BIA's trust duties (contained in Title 25 of the Code of Federal Regulations) are served by assisting the Rancheria to obtain access to its reservation, which has been landlocked, denying its people of economic potential. Caltrans, created in 1972 by AB 69, which consolidated two former departments, is responsible for planning, designing, operating, and maintaining California's state highway system. Its mission is to improve mobility across California. Despite these fundamental differences, both the National Environmental Policy Act (NEPA) and the California Environmental Quality Act (CEQA) require Federal and State agencies to work together to eliminate duplication between NEPA and CEQA (Sec. 40 CFR § 1506.2, Elimination of Duplication with State and Local Procedures; CEQA Guidelines §§ 15170, 15222). This cooperation includes the requirements to prepare joint environmental assessments and impact statements as well as planning processes and hearings (40 CFR §§ 1506.2 (b) and (c); CEQA Guidelines §§ 15170, 15222, 15226). Where States have requirements that go beyond NEPA, Federal agencies are required to cooperate in fulfilling those requirements "so that one document will comply with all applicable laws" (40 CFR § 1506.2 (c); see CEQA Guidelines §15222). This cooperation to prepare a joint Federal-State document will insure

that all the environmental requirements of both jurisdictions are fulfilled (once rather than twice) and will facilitate judicial review of the single document.

This EIR/EA was prepared in compliance with the California Environmental Quality Act (CEQA), the CEQA *Guidelines* (California Code of Regulations [CFR], Title 14), and the National Environmental Policy Act (NEPA) and the CEQ NEPA Regulations, 40 CFR Parts 1501-1508. Consistent with CEQA and NEPA, this EIR/EA is a public information document that assesses potential environmental impacts of the Proposed Project, as well as identifies mitigation measures and alternatives to the Proposed Project that could reduce or avoid adverse environmental impacts. CEQA requires that state and local government agencies consider the environmental consequences of projects over which they have discretionary authority. The EIR/EA is an informational document used in the planning and decision-making process. It is not the intent of an EIR/EA to recommend either approval or denial of a project.

NEPA and CEQA have different thresholds of "significance." It is often the case that using Federal criteria, impacts are either found not to be significant, or if found to be potentially significant, the impacts are then mitigated to less than significant. In this case the BIA has determined that the impacts of the Interchange warrant preparation of this Environmental Assessment, after which the agency must decide whether to prepare a Finding of No Significant Impact (FONSI, which could include a "mitigated FONSI") or an Environmental Impact Statement (EIS). Based on the different thresholds of significance of CEQA, Caltrans has determined to prepare an EIR. A CEQA impact checklist and a discussion of the Proposed Project's impacts are provided in **Appendix A**. The checklist provides an inventory of potential environmental impacts, and the significance of the Proposed Project's impacts on each category. CEQA requires that a Lead Agency neither approve nor carry out a project as proposed unless the significant environmental effects have been reduced to an acceptable level, or unless specific findings are made attesting to the infeasibility of altering the project to reduce or avoid environmental impacts (CEQA *Guidelines*, Sections 15091 and 15092). An acceptable level is defined as eliminating, avoiding, or substantially lessening the significant effects. CEQA also requires that decision-makers balance the benefits of a Proposed Project against its unavoidable environmental risks. If environmental impacts are identified as significant and unavoidable, the project may still be approved if it is demonstrated that social, economic, or other benefits outweigh the unavoidable impacts. The Lead Agency would

See Figure 1-1

See Figure 1-2

then be required to state in writing the specific reasons for approving the project based on information presented in the EIR/EA, as well as other information in the record. This process is defined as a "Statement of Overriding Considerations" by the CEQA *Guidelines*, Section 15093.

1.2 Type Of Environmental Impact Report/Environmental Assessment

The CEQA *Guidelines* identify several types of EIRs, each applicable to different project circumstances. This EIR is prepared as a Project EIR pursuant to CEQA *Guidelines* Section 15161. This type of EIR focuses primarily on the changes in the environment that would occur as a result of project implementation, and examines all phases of a particular project (i.e., planning, construction, operation). Ultimately, the EIR is used by the Lead Agency as a tool in evaluating a Proposed Project's environmental impacts and can be further used to modify, approve, or deny approval of a Proposed Project based on the analyses provided in the EIR.

The BIA is acting as a joint-lead agency with Caltrans on the Proposed Project. The BIA will enter into a cooperative agreement with Caltrans for the construction and operation of the interchange, take the 5.6 acre parcel into the name of the United States, and designate the interchange (federal portion) as part of the Indian Reservation Road system (IRR). The IRR Program is a jointly administered program by the Federal Highway Administration and by the BIA; through an Interagency Memorandum of Agreement as established by Title 23 U.S.C. Section 204. The environmental review for these BIA actions is covered within this EIR/EA.

1.3 EIR/EA Assumptions

This Draft EIR/EA is based on the following general assumptions:

- The project will be developed based on the general specifications outlined in Chapter 4.0, *Alternatives Considered*.
- The traffic, noise, and air quality analyses were prepared taking into account the operation and effects of the proposed Shingle Springs hotel and casino.
- The new interchange will be developed entirely within the Caltrans Highway 50 right-of-way (ROW) and a 5-acre parcel leading up to the existing Rancheria.

- Construction, operation and maintenance of the interchange will not require El Dorado County permits and/or approvals given that no County jurisdiction exists within the boundaries of the proposed interchange.

- The EIR/EA is tiered from the Final Environmental Assessment: Shingle Springs Rancheria Hotel and Casino Project, El Dorado County, California (NIGC, 2001), and from the Notice of Finding of No Significant Impact: Proposed Shingle Springs Hotel and Casino Project (January 2002), whose coverage includes the growth inducing/indirect effects associated with the construction and operation of the Shingle Springs hotel and casino, which documents are incorporated by reference.

1.4 EIR/EA Process

1.4.1 Lead Agencies

Caltrans is the Lead Agency for preparation of the CEQA component of the Shingle Springs Interchange Project EIR/EA. Sections 15050 and 15367 of the State CEQA *Guidelines* define the "Lead Agency" as the "public agency which has the principal responsibility for carrying out or approving a project." The key contact person for Caltrans is:

Mr. Steve Hetland, Project Manager
State of California, Department of Transportation
2800 Gateway Oaks Drive, Suite 100
Sacramento, CA 95833

The BIA is the Lead Agency for the NEPA component of the Shingle Springs Interchange Project EIR/EA. The key contact person for the BIA is:

Mr. William Allan, Pacific Region Environmental Specialist
U.S. Department of Interior, Bureau of Indian Affairs
Pacific Region Office, 2800 Cottage Way, Room W-2820
Sacramento, CA 95825-1846

1.4.2 Notice Of Preparation

In accordance with Section 15082 of the CEQA *Guidelines*, Caltrans circulated a Notice of Preparation (NOP) for this EIR on July 5, 2001, for a 30-day review period which expired August 6, 2001. The NOP is presented in **Appendix B**. These notices were circulated to the

public, local, state, and federal agencies, and other interested parties to inform responsible agencies and the public that the Proposed Project could have significant effects on the environment and to solicit their comments.

Comments received to-date covered issues addressing the project description, direct impacts associated with the operation of the proposed interchange, indirect impacts associated with the hotel and casino development on the Shingle Springs Rancheria, cumulative effects, growth inducing effects and alternatives to the proposed interchange. The concerns raised in response to the NOP were considered during preparation of the Draft EIR and are presented in **Appendix B**.

The BIA prepared a notice of Joint-Lead Agency Role by the Bureau of Indian Affairs for the Shingle Springs Rancheria Interchange Project (**Appendix B**). This notice was distributed on December 17, 2001 to public, local, state, and federal agencies, and other interested parties.

1.4.3 Draft EIR/EA

This document constitutes the Draft EIR/EA. The Draft EIR/EA contains a description of the project's purpose and need, project alternatives, description of the environmental setting, identification of project impacts, and mitigation measures for impacts found to be significant.

1.4.4 Public Review

This document is being circulated to local, state, and federal agencies and to interested organizations and individuals who may wish to review and comment on the report. The mailing list in **Appendix C** provides individuals to whom a notice of availability has been sent. Please note that this document contains information incorporated by reference. The public can review this information at the following addresses during normal business hours (8am to 5pm):

State of California, Department of Transportation
2800 Gateway Oaks Drive, Suite 100
Sacramento, CA 95833

and

U.S. Department of Interior, Bureau of Indian Affairs
Pacific Region Office, 2800 Cottage Way, Room W-2820
Sacramento, CA 95825-1846

Publication of this Draft EIR/EA marks the beginning of a 45-day public review period. Caltrans provides that no person be excluded from participation or otherwise be subjected to discrimination under any program of activity administered by the Department (**Appendix D**). During this review period, written comments will also be received by Caltrans or the BIA at the following addresses:

Mr. Steve Hetland, Project Manager
State of California, Department of Transportation
2800 Gateway Oaks
Sacramento, CA 95833

or

Mr. William Allan, Pacific Region Environmental Specialist
U.S. Department of Interior, Bureau of Indian Affairs
Pacific Region Office, 2800 Cottage Way, Room W-2820
Sacramento, CA 95825-1846

1.4.5 Final EIR/EA And EIR/EA Certification

Written comments received in response to the Draft EIR/EA will be addressed in a Response to Comments addendum document which, together with the revised Draft EIR/EA text, will constitute the Final EIR/EA. Caltrans will then review the project, the EIR/EA, and public testimony and decide whether to certify the EIR/EA and whether to approve the project or deny the project. Final approval of an interchange at the project location will be made by Caltrans in conjunction with approval of this environmental document. The California Transportation Commission (CTC) will approve the break in access control. If Caltrans approves the project, even though significant impacts identified by the EIR cannot be mitigated, Caltrans must state in writing the reasons for its actions. A Statement of Overriding Considerations must be included in the record of the project approval and mentioned in the Notice of Determination.

As stated above, after preparation of the Final EIR/EA, BIA will make its determination whether to prepare a FONSI or an EIS. The federal action considered by the BIA includes the inclusion of the project within the Indian Reservation Roads (IRR) system, taking the 5.6 acre parcel into the name of the United States of America, and entering into a Cooperative

Agreement with Caltrans for the construction and maintenance of the interchange/access road.

1.4.6 Mitigation Monitoring And Reporting Program

CEQA Section 21081.6, requires lead agencies to "adopt a reporting and mitigation monitoring program for the changes to the project which it has adopted or made a condition of project approval in order to mitigate or avoid significant effects on the environment." The specific "reporting or monitoring" program required by CEQA is not required to be included in the EIR. Throughout this EIR/EA, however, mitigation measures have been clearly identified and presented in language that will facilitate establishment of a monitoring and reporting program. Any mitigation measures adopted by Caltrans as conditions for approval of the project will be included in a Mitigation Monitoring and Reporting Program to verify compliance.

1.5 EIR/EA Organization

This Draft EIR/EA is organized into twelve chapters as described below.

Chapter 1.0, Introduction. This chapter describes the purpose and organization of the EIR/EA and the EIR/EA preparation, review, and certification process.

Chapter 2.0, Executive Summary. A summary of the project description, a description of issues to be resolved and areas of controversy, the significant environmental impacts that would result from project implementation, and mitigation measures proposed to reduce or eliminate those impacts are provided in this chapter, pursuant to CEQA *Guidelines* Section 15123.

Chapter 3.0, Project Description. Chapter 3.0 describes project background, outlines project objectives, and summarizes components of the Proposed Project, pursuant to CEQA *Guidelines* Section 15124. It also includes a description of the purpose and need for the proposal pursuant to NEPA at 40 CFR § 1508.9 (b).

Chapter 4.0, Alternatives to the Proposed Project. Chapter 4.0 provides descriptions for each of the alternatives to the Proposed Project, pursuant to CEQA *Guidelines* Section 15126(f) and 40 CFR § 1508.9(b). These alternatives are analyzed together with the Proposed Project in Chapter 5.0, Environmental Setting, Impacts, and Mitigation Measures.

Chapter 5.0, Environmental Setting, Impacts, and Mitigation Measures. Each environmental issue area describes the existing environmental setting, discusses the environmental impacts associated with project construction and operation, and identifies mitigation measures for the impacts of the Proposed Project, as well as all the alternatives to the Proposed Project, pursuant to CEQA *Guidelines* Sections 15125 and 15126 and 40 CFR § 1508.9 (b). .

Chapter 6.0, Growth Inducing Impacts. Chapter 6.0 discusses the potential for the Proposed Project to induce urban growth and development, pursuant to CEQA *Guidelines* Section 15126(d).

Chapter 7.0, Cumulative Impacts. Chapter 7.0 discusses the potential for the Proposed Project and project alternatives to result in cumulative impacts, pursuant to CEQA *Guidelines* Section 15130.

Chapter 8.0, Significant Unavoidable Adverse Impacts. Chapter 8.0 summarizes significant unavoidable adverse impacts of the Proposed Project and project alternatives, pursuant to CEQA *Guidelines* 15126(b).

Chapter 9.0, Indirect Effects. Chapter 9 discusses the potential indirect effects that may result from the Proposed Project, pursuant to CEQA *Guidelines* 15126.4 (D), 15358 (2) and 15064(2).

Chapter 10.0, Report Preparation. Chapter 10.0 provides the names of City project staff and the EIR authors and consultants, pursuant to CEQA *Guidelines* 15129 and a listing of agencies and persons consulted pursuant to 40 CFR § 1508.9 (b).

Chapter 11.0, Acronyms. Chapter 11.0 provides a list of technical terms used, including definitions.

Chapter 12.0, References. Chapter 12.0 provides a list of reference materials and persons/agencies consulted during the preparation of the EIR.

Appendices. The appendices are located at the back of the EIR and are referenced in the Table of Contents.

1.6 Incorporation By Reference

In accordance with §15150 of the State CEQA Guidelines, and 40 CFR 1502.21 of the NEPA regulations, this EIR/EA incorporates the following by reference: Final Environmental

Assessment: Shingle Springs Rancheria Hotel and Casino Project; El Dorado County, California (December, 2001) and Notice of Finding of No Significant Impact: Proposed Shingle Springs Hotel and Casino Project (January 2002). These documents can be reviewed at the locations identified in Section 1.4.4.

CEQA Guidelines Section 15150(a) states that "(a)n EIR…may incorporate by reference all or portions of another document which is a matter of public record or is generally available to the public. Where all or part of another document is incorporated by reference, the incorporated language shall be considered to be set forth in full as part of the text of the EIR…" CEQA goes on to state that incorporated text shall be briefly summarized, and the entire document be made available for public review (CEQA Guidelines Sections 15150(b) and c).

Pursuant to NEPA, "(a)gencies shall incorporate material into an environmental impact statement by reference when the effect will be to cut down on bulk without impeding agency and public review of the action. The incorporated material shall be cited in the statement and its content briefly described" (40 CFR 1502.21).

This document is referenced and elements are discussed and summarized within Chapter 9 of this EIR/EA.

Chapter 2 Executive Summary

2.1 Introduction

2.1.1 Project Location

The Proposed Project would result in the construction of an interchange/access road from Highway 50 directly to the Shingle Springs Rancheria (Rancheria) located approximately nine miles west of Placerville, between the Shingle Springs Drive and Greenstone Road interchanges in El Dorado County (**Figures 1-1 and 1-2**).

2.1.2 Alternatives Considered

Two alternative designs are being considered for the Proposed Project. Both of the alternatives being considered will provide direct access to and from the Rancheria via eastbound and westbound on- and off-ramps. The first alternative design – the "Flyover Design" – uses a loop off-ramp in the eastbound direction (**Figure 2-1**). Vehicles exiting the freeway in either the eastbound or westbound direction will travel unimpeded by signals to the Rancheria boundaries. This alternative design would provide diagonal ramps for westbound movements, and direct connector ramps for eastbound movements. The second alternative design – the "Diamond Design" – is a diamond interchange located at the same location as the first alternative (**Figure 2-2**). Each on- and off-ramp under this design would include a controlled intersection directing vehicular traffic to the Rancheria. Each design alternative would include the construction of an eastbound auxiliary lane that would extend from the new interchange to the existing Shingle Springs Drive interchange (**Figure 2-3**).

Both of the design alternatives include an undercrossing at Artesia Road. Artesia Road is a private road immediately south of the existing Rancheria that provides access to 2 residences located between the Rancheria and the freeway. The proposed grade separation would preclude a future connection of Artesia Road to the interchange.

The entire interchange (under both design alternative) will be constructed within the Caltrans right-of-way (ROW) and a 5-acre parcel connecting the Caltrans ROW with the Rancheria. Approximately 4-acres of Caltrans ROW will be needed for the project. Therefore, the entire project site is approximately 9-acres in size. In addition to the above two design alternatives, the EIR/EA will also address the No Project/Action Alternative as mandated by CEQA and NEPA. The No Project/Action Alternative assumes that no interchange, or other direct

See Figure 2-1

See Figure 2-2

See Figure 2-3

access, is provided to the Rancheria. The other assumption under the No Project/Action Alternative is that the Shingle Springs Rancheria will not build out with planned land uses.

2.2 Issues To Be Addressed And Potential Areas Of Controversy

In accordance with Section 15082 of the CEQA *Guidelines*, Caltrans circulated a NOP on July 5, 2001, for a 30-day review period. These notices were circulated to the public, local, state, and federal agencies, and other interested parties to inform responsible agencies and the public that the Proposed Project could have significant effects on the environment and to solicit their comments. The NOP and comment letters in response to the NOP are presented in **Appendix B**. Additionally, the BIA circulated a joint-lead agency notice in December of 2001. This notice alerted the public, local, state, and federal agencies and other interested parties that the BIA was assuming a joint-lead agency role because the proposed interchange is essential to relieving the landlocked status of the Rancheria. The notice included a statement that the proposed interchange has been made part of the Indian Reservation Roads (IRR) system, jointly administered by the Federal Highway Administration and the BIA. The notice was distributed to mailing list used by Caltrans for the NOP, plus those who commented during the 30-day review period. The notice and comment letters received in response to the notice are also presented in **Appendix B.**

The following environmental resources were found to have the potential of being significantly affected by the Proposed Project and have been addressed in greater detail in the Draft EIR/EA.

- Land Use Consistency and Compatibility
- Geology and Soils
- Transportation/Circulation
- Air Quality
- Noise and Vibration
- Biological Resources
- Visual Resources
- Socioeconomics
- Cultural Resources
- Hazardous Materials
- Water Quality
- Drainage

One issue to be resolved is the listing of the interchange project in the Metropolitan Transportation Plan and Metropolitan Transportation Improvement Program (MTP/MTIP). The interchange project must be in the MTP/MTIP for Caltrans to approve the project, and for the California Transportation Commission (CTC) to allow the "break in access" along Highway 50. To date, the Sacramento Area Council of Governments (SACOG) has included this project in their amendment process; however, final inclusion of the project into the MTP/MTIP cannot be made until either a regional air quality conformity analysis is undertaken and approved by SACOG, or a project level conformity analysis is undertaken and approved by the relevant governmental agency.

The area of controversy for the interchange project does not have to do with the interchange project per se. The construction of the interchange would allow free and open access to the Rancheria which currently experiences limited access. This open, unfettered access to the Rancheria will allow the Tribal Government to develop a hotel and gaming facility within the confines of the 160-acre Rancheria. This hotel and gaming facility project has recently been considered by the National Indian Gaming Commission (NIGC) under the NEPA process. The NIGC has issued a Finding of No Significant Impact (FONSI) that will allow for construction once the interchange project is approved.

Several commenters claim that the hotel and gaming project is an element of this interchange project, and the environmental effects of that project need to be considered as a direct project impact. As discussed below, the hotel and gaming project is not considered an element of this project description; however, the effects of the hotel and gaming facility are considered a growth inducing/indirect impact. The growth inducing/indirect impact analysis for the hotel and gaming facility is incorporated by reference from the Final Environmental Assessment approved by the NIGC, and is presented in Chapters 6.0 and 9.0 of the Draft EIR/EA, respectively.

2.2.1 Project Description

Several NOP commenters raised the issue of the proposed Rancheria hotel and casino project and the assertion that it should be a component of the project description for purposes of this environmental review. The proposed hotel and casino is a separate project proposed for the southwest corner of the existing Rancheria. This project, consistent with Rancheria land use designations, was considered by the National Indian Gaming Commission (NIGC). The NIGC is a federal agency whose powers include overseeing gaming development and operation on Indian property. The NIGC's discretionary action for the hotel and gaming project included approval of the Gaming Management Contract between the Tribal

Government and Lakes Gaming/Kean Argovitz Resorts. The foreseeable consequence of approval of the Gaming Management Contract includes the construction and operation of the hotel and casino; therefore, NEPA compliance was required. The NIGC approved a Finding of No Significance Impact (FONSI) for the hotel and casino project in January, 2002. The EA developed for the hotel and casino project included the construction and operation of an interchange at the location of the project site under consideration for this Draft EIR/EA.

The project description covered under this Draft EIR/EA is for the proposed interchange that would allow for access to the Rancheria. As shown in Chapter 3.0 of this document, the interchange is needed with or without the proposed hotel and casino project. The focus of this Draft EIR/EA is on constructing an interchange to provide access to the Rancheria. The foreseeable consequence of this interchange is the recently approved hotel and casino project located on the southwest corner of the Rancheria. The hotel and casino issues are indirect effects of the interchange project, not as a component of the project description. Information from the recently approved hotel and casino environmental assessment is incorporated by reference into this Draft EIR/EA. Please see Chapters 6.0 and 9.0 for the discussion of growth inducing and indirect effects. By incorporating by reference and tiering from the NIGC EA and FONSI, the lead agencies recognize that an agency with jurisdiction has evaluated on-reservation environmental impacts in a manner which does not impinge on Tribal sovereignty, as would be the case were a State agency to attempt to regulate on-reservation impacts.

2.2.2 Alternatives

NOP commenters stated that the Draft EIR/EA should address providing access to the south side of Highway 50, and should address an alternative that includes relocation of the project. The purpose of the Proposed Project is to provide open access to the Rancheria, which is located on the north side of Highway 50. Addressing an alternative that provides access to the south side of Highway 50 does not meet the project objectives stated in Chapter 3 of this Draft EIR/EA. Moreover, the environmental effects of providing access to the south side of Highway 50 would be greater than under the Proposed Project. Therefore, this alternative need not be considered within the context of this environmental document.

Relocating the interchange to a different location would not result in either attainment of the project objectives, nor would it reduce the environmental effects of the Proposed Project. An alternative interchange location that does not provide access to the existing Rancheria would not meet any of the project objectives; therefore, need not be considered within this Draft EIR/EA. Please see Chapter 3 for a discussion of alternatives eliminated from consideration.

Another issue regarding the need to consider a smaller hotel and gaming facility as an alternative was raised during the NOP comment period. The hotel and gaming facility is not an element of the Proposed Project considered in this document; therefore, alternative sizes need not be considered.

2.2.3 Shingle Springs Hotel And Casino

Several commenters presented information regarding the environmental effects of the hotel and gaming project that will be located on the existing Rancheria. As mentioned above, the hotel and gaming facility is not an element of the interchange Project Description. The hotel and casino is treated as a growth inducing/indirect effect of this interchange project for purposes of this environmental review. The various comments presented for the hotel and gaming facility were considered by the NIGC and BIA in the development of the Final EA. Information from the Final EA has been incorporated by reference into this Draft EIR/EA and is presented in Chapters 6.0 and 9.0.

2.2.4 Traffic

Comments were provided that focused on the traffic model used, El Dorado County Measure Y, trip generation assumptions, capture rate, local road impacts, and cumulative traffic. These comments were based on a publicly circulated EA by the BIA and NIGC for the hotel and casino project. Many of the traffic comments received during the NOP comment period for this Draft EIR/EA were the same or similar comments submitted to the BIA and NIGC during the comment period on the EA. These comments were in no way related to the NOP information presented for this Proposed Project. The NIGC and BIA have reviewed these comments in light of the proposed hotel and gaming facility, revised the information accordingly, and issued a Final EA and FONSI for the hotel and casino project. The traffic information provided in this Draft EIR/EA has, therefore, benefited from detailed public input provided during the previous NEPA process on the hotel and casino project. The traffic analysis presented in Section 6.3 of this Draft EIR/EA considers the detailed input provided during the NOP comment period.

2.2.5 Air Quality

As was the case for the traffic issue, a number of commenters presented a critique of the air quality information previously circulated for the EA prepared by the BIA and NIGC for the hotel and gaming facility. The detailed comments were not based on information presented in the NOP for the interchange project. The general category of issues raised during this NOP comment period included the need to analyze standard project specific and cumulative air

quality emissions, asbestos emissions, and toxic air quality impacts. The various detailed comments were considered by the NIGC and BIA in their drafting of the Final EA, which has been incorporated by reference into Chapter 9.0 of this Draft EIR/EA. Additionally, Section 6.4 of this Draft EIR/EA consider the general categories of comments made regarding air quality impacts of the interchange project.

2.2.6 Growth Inducement

Growth inducement comments were mainly focused on impacts that would result from the hotel and gaming facility project, as opposed to the interchange project. Chapter 6.0 of this Draft EIR/EA focuses on the growth inducement of the interchange project. A separate section within Chapter 9.0 addresses the indirect growth inducing effects of the hotel and casino project. This information is incorporated by reference from the Final EA (December, 2001) for the hotel and casino project.

2.3 Summary Of Environmental Impacts

Table 2-1 presents a summary of project impacts and proposed mitigation measures that would avoid or minimize potential impacts. In the table, the level of significance of each environmental impact is indicated both before and after the application of the recommended mitigation measure(s). The following abbreviations have been used to identify the project alternatives:

Alternative A (AA): No Project/Action Alternative
Alternative B (AB): Flyover Design Interchange
Alternative C (AC): Diamond Design Interchange

For detailed discussions of all project impacts and mitigation measures, the reader is referred to environmental analysis sections in Chapter 5.0, Environmental Setting, Impacts, and Mitigation Measures.

2.4 Environmentally Superior Alternative

After reviewing the comparative impacts of all alternatives, the EIR concludes that the No Project/Action Alternative is the environmentally superior alternative. CEQA requires that should the No Project/Action Alternative be the environmentally superior alternative, the EIR must specify a development alternative which is environmentally superior to the other build alternatives (CEQA *Guidelines* Section 15126.6 (e) (2)). In this case, the EIR finds that Alternative B – Flyover Alternative Design is the environmentally superior alternative.

Alternative B would be located on the same site as Alternative C, which is the other interchange design alternative. As one can see from the attached summary tables, and the detailed analysis within Chapter 5.0, the comparative impacts of the two design alternatives are generally similar. However, Alternative C includes interchange intersections whereas Alternative B does not. This creates an added existing and cumulative traffic impact (6.3-3 and 6.3-7) for Alternative C when compared with Alternative B. In addition Alternative C would affect approximately 1.67 acres of mixed oak woodland, compared with approximately 1.1 acres for Alternative B. The visual alteration of the project area would be impacted less under Alternative B than Alternative C. This is due primarily to the more pronounced off- and on-ramps required under Alternative C. The undercrossing of the eastbound on-ramp and the at-grade westbound off- and on-ramps under Alternative B eliminates this added visual intrusion onto the surrounding viewscape. Lastly, the drainage inlet and culvert impacts associated with Alternative B are less than Alternative C. In summary, as noted in the summary tables and within Chapter 5.0 the magnitude of the transportation, biological, visual, and drainage impacts under Alternative B are less than Alternative C. Therefore, Alternative B is considered the environmentally superior build alternative.

See Table 2-1

Chapter 3 Purpose and Need

3.1 Background

3.1.1 Existing Transportation Facilities

Highway 50 is an east-west divided freeway, which provides regional access between Sacramento and Placerville, and to recreational areas within the southern Lake Tahoe area. In the vicinity of the proposed interchange, Highway 50 has two 12 foot (3.6 meter (m)) travel lanes in each direction, 10 foot (3.0 m) paved outside shoulders, 5 foot (1.5 m) paved inside shoulders, and a 70 foot (21.3 m) wide unpaved median. All lanes and shoulders consist of asphalt concrete (AC) pavement.

Shingle Springs Drive is a 2-lane rural roadway, which runs in a north-south direction immediately west of the proposed interchange. The roadway begins within the gated residential community immediately north of Highway 50 and Rock Barn Road, and continues south of Highway 50 approximately 1 mile (1.5 kilometers (km)) to Buckeye Road, where the roadway terminates. The County of El Dorado maintains Shingle Springs Drive up to the private gate immediately north of Highway 50 and Rock Barn Road.

Greenstone Road is a 2-lane rural roadway, which runs in a north-south direction immediately east of the proposed interchange. The roadway begins approximately 1 mile (1.5 km) north of Highway 50 at Green Valley Road, and continues south of Highway 50 for approximately 2 miles (3 km) to Mother Lode Drive. There are no sidewalks and minimal or non-existent shoulders along the roadway, and the roadway width is approximately 24 feet (7.2 m). The County of El Dorado maintains Greenstone Road.

Grassy Run Road, Rolling Rock Road, and Reservation Road comprise the route that is currently used to access the Rancheria. To access the Rancheria today, traffic turns left (towards the west) from Greenstone Road to Grassy Run Road. Approximately 1000 feet (300 m) west of Greenstone Road, Grassy Run Road transitions from a County road to a private residential roadway. Rancheria bound traffic continues along the private roads of Rolling Rock Road and Reservation Road. All three of these roads are narrow 2-lane roadways with no sidewalks or shoulder, with restricted horizontal and vertical curvature.

Artesia Road is a private roadway, approximately 20 feet (6 m) wide, connecting Shingle Springs Drive with properties in Buckeye Rancheria Subdivision, south and west of the Shingle Springs Rancheria.

3.1.2 Shingle Springs Rancheria-Historic Access Issues

In December 1915, the BIA acquired 80 acres of land from private owners in El Dorado County. In March 1920, the BIA also acquired an adjacent 160-acre parcel to the north. Each deed to the BIA contained language stating "the land is held in trust for the Sacramento Verona Band of Homeless Indians." Historic maps and records indicate that an unimproved road off Greenstone Road, south of the current Highway 50 alignment, provided access to the 240-acre property. That road nearly followed the current alignment of Studebaker Road/ Hope Lane.

Highway 50 in the project area was originally constructed along the alignment of what is currently called Mother Lode Drive; a two lane conventional highway located approximately 2 km south of the current alignment. The State began planning for the construction of a new freeway, connecting Sacramento and Lake Tahoe in the late 1950's. In the early 1960's, the State began surveying for the currently Highway 50 alignment and subsequently began negotiations with property owners for acquisition of the necessary ROW. Contact was made with the BIA regarding ROW needs across BIA lands.

The original ROW proposal was to acquire a strip of land through the southerly portion of the 240-acre property and provide access to the northerly 176-acre portion via an underpass/frontage road that would connect to Greenstone Road, a County maintained road. In March 1966, title to the southerly 80-acre parcel was conveyed from the BIA to Clarance Padilla, the local resident at the time.

When the BIA transferred title of the property to Padilla, no right of access was retained across that 80-acre parcel to serve the remaining 160-acre parcel to the north. This action resulted in the need to only acquire ROW from the Padilla property. Access to the remaining 160-acre parcel, unoccupied at the time, was assumed to occur in the future from an interior road system to be developed on an adjoining parcel.

Subsequent negotiations with Padilla and the BIA focused on the acquisition of a freeway ROW parcel and northerly remnant of 16-acres that would be severed by the freeway. Based on an economic evaluation between constructing the underpass/frontage roads and the full acquisition of the remnant 16-acre parcel, it was determined that acquisition was the most cost effective approach. On July 22, 1966, a ROW contract was completed with Padilla to acquire the freeway ROW and the remnant 16-acre parcel. The Grant Deed to the State was subsequently recorded in El Dorado County on November 4, 1966. Construction of the Highway 50 freeway improvements was completed in 1969.

In 1974, an adjacent residential development to the east of the existing 160-acre Rancheria, known as "Grassy Run", was established. A local private road system was established to access the parcels in the new subdivision. Public access to the subdivision was provided via Grassy Run Court off Greenstone Road, both County maintained roads. Permissive access across the private roads within the subdivision (ultimately determined to be for residential purposes only) was subsequently granted to the Rancheria in 1982.

At present, the Shingle Springs Rancheria is effectively landlocked for economic purposes. Since there is no road access available for any on-reservation economic activity, the Tribe needs road access to permit its members to engage in economic activities and support themselves on their reservation. Any commercial or delivery traffic is limited/restricted by the adjacent subdivision's Homeowners Association. The current access route is a narrow two-lane paved road that varies from 23 to 26 feet (7 to 8 m) in width through a residential development (**Figure 3-1**). The route is approximately 2 miles (3 km) long and very circuitous. Numerous speed bumps exist along the route to discourage speeding and external traffic. These conditions also constrain emergency vehicle response times during critical fire/safety events.

The Tribe still desires a viable revenue base to fund governmental programs and decrease their dependence on Federal and State funding, as well as wanting the opportunity to more fully utilize the Rancheria site for specific Tribal interests. At this time, the Tribe is proposing to construct a new hotel and gaming facility, under the terms of the requirements of Federal Law, the Tribal-State Compact between the State and the Tribe, and the Tribe's gaming and health and safety regulations. Construction of the hotel and gaming facility will provide a revenue base for the Tribe and its members. The revenue base, along with the interchange access to Highway 50, will allow better utilization of the Rancheria site. Without direct interchange access to Highway 50, no commercial facilities can be constructed on the Rancheria.

3.2 Purpose And Need

The purpose for the proposed interchange is to provide access from Highway 50 to the existing Rancheria, which has very limited access (i.e., without unrestricted public road access). The need for this project is precipitated by the fact that the Tribe cannot develop any economic enterprise on its current Rancheria without having an improved access route:

- The existing limited-access route to the Rancheria travels through a surrounding residential development;

- The access route to the Rancheria can only be used for commercial deliveries between the hours of 9 a.m. and 2:30 p.m. during weekdays, with fines for violating these time restrictions. This restriction also prohibits the Tribe from using the land on the Rancheria for commercial purposes.

The benefits of the Proposed Project are that improved commercial development on the Rancheria will provide the Tribe with a viable revenue base. Commercial revenues will be used to fund governmental programs and decrease the Tribe's dependence on Federal and State funding. Besides governmental functions, the Tribe plans to use revenues to support social and educational programs for elderly, poor and young Tribal members. Revenues will also allow the Tribe to upgrade equipment, hire additional staff, and expand environmental, health and safety programs. The commercial development will provide employment opportunities for tribal members and many local non-tribal residents.

See Figure 3-1

Chapter 4 Alternatives Considered

4.1 Introduction

The formation of alternatives for analysis in this Draft EIR/EA involved the review of prior studies and additional analysis (Project Study Report). The Project Study Report (PSR) developed and screened a broad range of alternatives, some of which are carried forward through this environmental analysis. The purpose of the alternatives analysis in this document is to describe a range of reasonable alternatives to the project that could feasibly attain most of the objectives of the Proposed Project, and to evaluate the comparative merits of the alternatives (CEQA *Guidelines*, Section 15126.6[a]). NEPA requires a brief discussion of alternatives as required by § 102 (2) (E) of the Act, which in turn requires analysis of alternative to recommended course of action in any proposal which involves unresolved conflicts concerning alternative uses of available resources. (43 USC § 4332 (2) (E), 40 CFR § 1508.9 (b))

Section 15126.6 (b) of the CEQA *Guidelines* requires consideration of alternatives that could reduce to a less-than-significant level or eliminate any significant adverse environmental impacts of the Proposed Project, including alternatives that may be more costly or could otherwise impede the Proposed Project's objectives. The range of alternatives evaluated in an EIR is governed by a "rule of reason", which requires the evaluation of alternatives "necessary to permit a reasoned choice". Alternatives considered must include those that offer substantial environmental advantages over the Proposed Project and may be feasibly accomplished in a successful manner considering economic, environmental, social, technological, and legal factors.

4.2 Alternatives Included In The Draft EIR/EA

This EIR/EA evaluates three alternatives: (1) Alternative A: No Project/Action Alternative, (2) Alternative B: "Modified-Trumpet" Style, similar to Type F-5 interchange (hereafter referred to as the "Flyover" Alternative), and (3) Type L1 Compact Diamond interchange (hereafter referred to as the "Diamond Interchange). Alternative A assumes that no interchange is constructed to provide access to the Rancheria. Additionally, Alternative A would result in no commercial development (i.e., hotel and casino) on the Rancheria. Details regarding the two development alternatives are provided below.

The proposed Shingle Springs Rancheria Interchange would be located to the south of the existing Rancheria, and would be approximately midway between the Shingle Springs Road

Interchange and the Greenstone Road Interchange. A connection to the Rancheria from Route 50 will be provided across the 5-acre (2.3 Ha) parcel immediately south of the Rancheria. Common features between interchange alternatives, besides general location, are (1) eastbound auxiliary lane, and (2) grade separation of Artesia Road. These common features are described as follows:

Eastbound Auxiliary Lane: The traffic operations analysis for this project indicated level of service (LOS) "F" for the eastbound off-ramp diverge movement for year 2025 traffic (PM peak hour); the constraint for this movement is not the off-ramp volume, but rather the volume of mainline traffic vs. available freeway capacity. The existing median in this area is 69.8 feet (21.3 m), which could accommodate up to an additional four mainline lanes (two in each direction), although no additional lanes are programmed at this time. An analysis for this movement assuming one additional eastbound lane shows a Year 2025 eastbound off-ramp diverge LOS "D" for the PM peak hour; consequently, an eastbound auxiliary lane is proposed between Shingle Springs Drive and the Shingle Springs Rancheria Interchange, which will improve the ramp diverge LOS. This auxiliary lane will be constructed by widening Route 50 into the median to create a third lane directly adjacent to the existing eastbound lanes. Once this additional lane is provided, existing No. 1 mainline traffic will be shifted to this "additional lane", which will allow the outside eastbound, or "slow-lane", to be used as the auxiliary lane for the new interchange. The total length of the new auxiliary lane is approximately 0.9 miles (1.6 Km) from Shingle Springs Drive to the new interchange.

Grade Separation of Artesia Road: Artesia Road, a private road providing access to 2 residences located between the Rancheria and the freeway, will be maintained with this project; a grade separation will be constructed between the interchange access road and Artesia Road, with the latter crossing over the interchange access road. This grade separation will allow continuous traffic flow to and from the Rancheria and will preclude a future connection of Artesia Road to the interchange. The reconstructed portion of Artesia Road also will be widened to 27.9 feet (8.53 m) to provide paved shoulders. The reconstructed portion of Artesia Road will be entirely on property owned by the project proponent; no additional easements will be required.

4.2.1 Alternative B – "Flyover" Alternative

The design of this alternative provides access north of Route 50 only; access south of Route 50 would be precluded. Although the accommodation of access and operations is similar to a trumpet-style (Type L-11) local interchange, the general layout is more similar to a Type F-5 interchange. This interchange provides diagonal ramps for westbound movements, and direct connector ramps for eastbound movements (**Figure 2-1**). Architectural renderings of this interchange design for the eastbound and westbound traveler are presented in **Figures 4-1**

and **4-2**. Additional information regarding the design alternatives can be found in the Project Study Report (Caltrans, 2001) produced by Caltrans for the proposed interchange project. This document is available during normal business hours at the Caltrans District 3 Office at 2800 Gateway Oaks Drive, Suite 100 Sacramento, CA. The Project Study Report is hereby incorporated into this Alternative discussion by reference.

Westbound off-ramp: The westbound off-ramp is a single lane diagonal ramp. The ramp will begin east of the proposed overcrossing and extend for approximately 1,394 feet (425 m) with one 11.8 foot (3.6 m) travel lane and 3.9 foot (1.2 m) and 7.9 foot (2.4 m) shoulders on the left and right sides, respectively. Earthwork, along with a retaining wall, will be required between the ramp and westbound Route 50. As the off-ramp approaches the Rancheria, it will curve in a northerly direction with a 180 foot (55 m) curve, and travel up to the undercrossing structure at Artesia Road. The off-ramp will maintain one 11.8 foot (3.6 m) travel lane and the 3.9 foot (1.2 m) and 7.9 foot (2.4 m) shoulders throughout.

Westbound on-ramp: The westbound on-ramp is a single lane diagonal ramp, with a standard merge to Route 50. Beginning at the Artesia Road undercrossing, the access road will consist of one travel lane 11.8 foot (3.6 m) wide with a 3.9 foot (1.2 m) and 7.9 foot (2.4 m) shoulder on the left and right sides, respectively. As the roadway approaches the Caltrans right-of-way, significant earthwork will be required. A 1:1 slope (or flatter) will be used to assure that slope stability is maintained. The westbound on-ramp will continue approximately 984 feet (300 m) from the 5-acre (2.3 Ha) parcel to its connection to Route 50. No structures, other than the undercrossing of Artesia Road, are proposed for the westbound on-ramp.

Eastbound off-ramp: The eastbound off-ramp will consist of three components: (1) beginning off-ramp, (2) fly-over structure, and (3) access road. The beginning of the eastbound off-ramp starts approximately 984 feet (300 m) west of the proposed fly-over structure. This section of the off-ramp would consist of one 11.8 feet (3.6 m) wide travel lane with 7.9 feet (2.4 m) and 3.9 feet (1.2 m) shoulders on the right and left sides, respectively. To accommodate the ramp, the existing hillside will be excavated and a tie-back wall constructed for stability purposes.

The “fly-over” overcrossing structure taking eastbound travelers over Route 50 will be supported by three columns. Columns will be located south of the eastbound lanes, within the median of Route 50 and north of the westbound lanes. The structure will consist of one 11.8 foot (3.6 m) travel lane, a 7.9 foot (2.4 m) shoulder on the right side and a 9.8 foot (3.0 m) shoulder on the left side (left side shoulder width increased for sight distance). The overcrossing structure will be designed to accommodate an ultimate 8 lanes on Route 50. The fly-over structure will continue into the 5-acre (2.3 Ha) parcel for approximately 295 feet (90 m) where it will meet existing grade.

See Figure 4-1

See Figure 4-2

A connector will extend for approximately 459 feet (140 m) from the end of the overcrossing to the Rancheria. The roadway will consist of one travel lane approximately 11.8 feet (3.6 m) wide with a 3.9 foot (1.2 m) left shoulder and 7.9 foot (2.4 m) right shoulder. An undercrossing will be constructed at Artesia Road to carry traffic into the Rancheria.

Eastbound on-ramp: The eastbound on-ramp is a diagonal ramp with direct connector undercrossing of Route 50. As is the case with the eastbound off-ramp, the eastbound on-ramp consists of three components: (1) access road, (2) Route 50 undercrossing, and (3) interchange on-ramp. The Rancheria connection begins at the Artesia Road undercrossing and continues as a one lane facility (with 3.9 foot (1.2 m) and 7.9 foot (2.4 m) shoulders) for approximately 918 feet (280 m) where it transitions into the Route 50 undercrossing. This undercrossing will be approximately 49.9 feet (15.2 m) wide and will accommodate the continuation of one-travel lane with shoulders both sides below the Westbound and Eastbound lanes of Route 50. The interchange on-ramp will extend from the Route 50 undercrossing for a distance of approximately 1,312 feet (400 m) to the Route 50 eastbound lanes. Earthwork will be required on the interchange on-ramp using a 1:2 slope (or flatter) to assure slope stability. The ramp will be designed with a standard merge to Route 50.

4.2.2 Alternative C – "Diamond" Alternative

This alternative is a modified Type L-1 compact diamond interchange with a two-lane overcrossing over Route 50, single lane ramps and signalized ramp intersections. On the north side of Route 50, the Overcrossing roadway widens to a four-lane roadway leading from Route 50 to the Rancheria. The connection includes an undercrossing of Artesia Road. The eastbound auxiliary lane on Route 50 will also be required as part of this project. Detailed geometrics are included in **Figure 2-2**. Architectural renderings of this interchange design for the eastbound and westbound traveler are presented in **Figures 4-3** and **4-4**.

Westbound off-ramp: The westbound off-ramp ramp is a single lane ramp, 11.8 feet (3.6 m) wide with 3.9 foot (1.2 m) and 7.9 foot (2.4 m) shoulders on the left and right sides respectively, extending for approximately 1,355 feet (413 m) to the ramp intersection. Because of the existing mainline grade and proposed overcrossing profile, the ramp grade will be 9.0%, uphill in the direction of travel. Because of the elevated profile, this ramp requires either extensive embankments or structure, as detailed below.

Westbound On-Ramp: The eastbound off-ramp ramp is a single lane ramp, 11.8 feet (3.6 m) wide with 3.9 foot (1.2 m) and 7.9 foot (2.4 m) shoulders on the left and right sides respectively, with a standard merge to Route 50, extending for approximately 1,230 feet (375 m) to the ramp intersection. This ramp would involve a short section of significant cut.

See Figure 4-3

See Figure 4-4

Eastbound off-ramp: The eastbound off-ramp ramp is a single lane ramp, 11.8 feet (3.6 m) wide with 3.9 foot (1.2 m) and 7.9 feet (2.4 m) shoulders on the left and right sides respectively, extending for approximately 1,050 feet (320 m) to the ramp intersection. The ramp will involve a substantial cut, along with a retaining wall, to avoid right of way impacts south of Route 50.

Eastbound On-Ramp: The eastbound on-ramp is a single lane ramp, 11.8 foot (3.6 m) wide with 3.9 foot (1.2 m) and 7.9 foot (2.4 m) shoulders on the left and right sides respectively, with a standard merge to Route 50, extending for approximately 1,345 feet (410 m) to the ramp intersection. Because of the existing mainline grade and proposed overcrossing profile, the ramp grade will be 8.9%, downhill in the direction of travel. Because of the elevated profile, this ramp requires either extensive embankments or structure, as detailed below.

Route 50 Overcrossing: The overcrossing consists of two 11.8 foot (3.6 m) lanes, one in each direction, with 7.9 foot (2.4 m) shoulders and Type 736 concrete barrier on each side. The two-lane structure will be 42.3 feet (12.9 m) wide, 220 feet (67 m) in length and consists of two spans with the center column located on the centerline of Route 50. The overcrossing would accommodate ultimate widening of Route 50 to eight lanes, as identified in the Transportation Concept Report. After crossing Route 50 and the westbound ramps, the structure continues as a four-lane structure as described below. A connection will be provided from the overcrossing to the Rancheria, widening from two lanes to four lanes north of the Westbound ramp terminal and continues to the Rancheria property. The first 335 foot (102 m) of the connection will be a viaduct to minimize grading impacts. The viaduct will be 74 feet (22.5 m) wide, 335 feet (102 m) long consisting of 4 spans.

Ramp Embankments/Structures: Alternative C ramps would be elevated using viaduct-type structures to minimize the amount of retaining walls and earthwork. For example, the eastbound off-ramp has an additional length of 256 feet (78 m) of structure, the EB on-ramp has 787 feet (240 m) of structure, the Westbound (WB) off-ramp requires 550 (167.5 m) of structure while the WB on-ramp requires 171 feet (52 m) of structure. A large retaining wall will be required along the south side of the eastbound off-ramp to support the slope cut.

4.3 Alternatives Eliminated From Consideration

CEQA Guidelines Section 15126.6 (c) states that the "EIR should …identify any alternatives that were considered by the lead agency but were rejected as infeasible during the scoping process and briefly explain the reasons underlying the lead agency's determination." This section of the Guidelines go on to state "among the factors that may be used to eliminate alternatives from detailed consideration in an EIR are: i) failure to meet most of the basic project objectives, (ii) infeasibility, or (iii) inability to avoid significant environmental impacts."

Four alternatives were considered and eliminated from the analysis. These alternatives included: (1) Diamond Interchange requiring additional right-of-way to the south of Highway 50, (2) Diamond Interchange Alternative with Highway 50 undercrossing, (3) Frontage Road Alternative, and (4) Alternative Location. The alternatives considered, but rejected, are briefly discussed below along with the reasons for rejection.

4.3.1 Diamond Interchange With Additional Right-Of-Way South Of Highway 50

This alternative would have resulted in the same basic design as the diamond interchange addressed in detail within this Draft EIR/EA. However, one basic difference is that the two eastbound ramps would have been located further south necessitating the acquisition of additional ROW to the south of Highway 50. This design was originally conceived to reduce the size of the retaining wall on the south side of the Highway. In order for this alternative to be constructed, the eastbound off-ramp would have required a considerable amount of rock removal, followed by the installment of a smaller retaining wall that would have encroached beyond the existing Caltrans ROW. The eastbound on-ramp would have had an elevated profile with extensive embankments when compared with the two build alternatives carried throughout this document. Additionally, in order for this design alternative to obtain vertical clearance over Route 50, slope fill would have extended beyond the existing ROW. Given that the Alternative C of this Draft EIR/EA assumes a diamond interchange design that does not require additional ROW, this additional ROW alternative is eliminated from consideration.

4.3.2 Compact Diamond Interchange Alternative With Undercrossing of Highway 50

This alternative would have resulted in the construction of an undercrossing under Highway 50 for the eastbound off-ramp and westbound on-ramp. The construction of an undercrossing would have required extensive excavation with very tall retaining walls (i.e. 65 feet (20 m) or greater in height), including the acquisition of ROW for grading limits. This alternative was reviewed and rejected due to the extensive excavation required. Additionally, Alternative C of this Draft EIR/EA assumes a diamond interchange design that does not require additional ROW. Therefore, this alternative is eliminated from consideration.

4.3.3 Frontage Road Alternative

Prior to evaluating direct interchange access to Highway 50, an evaluation was made as to feasibility of access to the Rancheria by extending frontage roads from two nearby adjacent

interchange exits. Connection to Greenstone Road via Grassy Run Road (public portion only) could be made through construction of a one-mile long roadway, requiring acquisition of five privately-owned, occupied residential parcels. However, these parcels are members of the Grassy Run Homeowners' Association, who have voiced objections over the economic development of Rancheria, and condemnation most likely would be required for acquisition. The Tribe was not interested in making people move from their homes against their wishes. In addition, the tribe is not in a legal position to condemn property, and the County of El Dorado has previously expressed opposition to economic development of the Rancheria, and presumably would not participate in condemnation for frontage road access.

Access to the interchange at Shingle Springs Drive faces similar challenges. An access road north of Highway 50 would require acquisition of 11-12 properties, which is not feasible due to similar condemnation issues. An access road south of Highway 50 would require acquisition from the Sacramento-Placerville Transportation Corridor Joint powers Authority (SPTC-JPA) right of way, which would create a discontinuity in a potential future resource. Additionally, it is likely that the railroad right of way would be determined to be a historic resource.

4.3.4 Alternative Location for the Interchange

A public comment on the NOP was received that expressed a desire to have the interchange relocated to areas more "appropriate to its high intense level of traffic impacts". An alternative location for the interchange does not meet the purpose and need to construct an interchange that will provide access to the existing Rancheria so that free and open access can be provided. Therefore, this alternative is eliminated from consideration.

Chapter 5.0 Environmental Setting, Impacts, and Mitigation Measures

5.1 Introduction To The Analysis

5.1.1 Introduction

Sections 5.2 through 5.13 in this EIR/EA provide an integrated presentation of the environmental setting, environmental impacts, and proposed mitigation measures for the following environmental issue areas:

- Land Use, Zoning, and Adopted Policies (5.2)
- Geology and Soils (5.3)
- Transportation and Circulation (5.4)
- Air Quality (5.5)
- Noise and Vibration (5.6)
- Biological Resources (5.7)
- Visual Resources (5.8)
- Socioeconomics (5.9)
- Cultural Resources (5.10)
- Hazardous Materials (5.11)
- Water Quality (5.12)
- Drainage (5.13)

Potential effects of implementing the proposed project, including cumulative effects, are identified along with mitigation measures recommended to lessen or reduce identified impacts. In cases where no mitigation is available, this fact is noted.

The setting section describes the environment in the project and study areas "as it exists before the commencement of the project." The setting is presented from site, local, subregional and/or regional perspectives, as appropriate to each environmental topic. The effects of the project are defined as changes to the environmental setting that are attributable to the project.

Impacts are identified and determined to be potentially significant, significant, cumulatively significant, significant unavoidable, less than significant, or beneficial. A summary of cumulative impacts is provided in Chapter 7.0.

A significant impact is defined as "...a substantial, or potentially substantial, adverse change in any of the physical conditions within the area affected by the project..." For each category of physical condition evaluated in this EIR, criteria for significance have been developed based on factual or scientific information; regulatory standards of local, state, and federal agencies; and goals, objectives, and policies identified in the El Dorado County General Plan.

Mitigation measures identified in this report are characterized in one of three categories: 1) measures necessary to reduce the identified impact below a level of significance; 2) measures recommended to reduce the magnitude of a significant impact, but not below a level of significance; and 3) measures recommended to reduce the magnitude of a less than significant impact. Where implementation of more than one mitigation measure is needed to reduce an impact below a level of significance, this fact is noted.

5.1.2 Cumulative Analysis

The cumulative impact analysis contained within this EIR/EA consists of impacts caused as a result of the combination of the project evaluated in this document together with other projects causing related impacts. Therefore the basis for the cumulative impact analysis within this document is the proposed interchange together with other transportation related improvements within the project vicinity. The roadway network surrounding the project site is assumed to remain the same for Cumulative Conditions as that which currently exists for Existing Conditions. Caltrans currently has no programmed improvement for US-50 for Cumulative Conditions, although there are currently discussions to either provide an HOV lane along the freeway, and/or 6 standard lanes along the freeway. Within this analysis, it is assumed that US-50 will remain a 4-lane facility.

The cumulative analysis also assumes growth for the region that will add traffic to the roadway network. Cumulative traffic volumes were established based on the El Dorado County traffic model as established for the 1996 El Dorado County General Plan. The model volumes are based on weekday PM peak hour conditions, and utilize Year 2022 as the future horizon year. Caltrans has established that the Year 2025 should be utilized to analyze Cumulative Conditions for this study. Cumulative volumes were initially established for year 2022 conditions, then factored up to year 2025 conditions through a straight line extrapolation of volumes.

Highway 50 volumes from the El Dorado County traffic model for 2022 conditions were very suspect. An analysis of PM peak hour volumes for 2022 conditions for US-50 shows that there was a loss of 850 vehicles from US-50 west of East Shingle Springs Drive to east of East Shingle Springs Drive. Since the model shows only 383 vehicles along East Shingle

Springs Drive south of US-50 (and volumes north of US-50 would continue to be very low and negligible), there was an obvious error in the model. El Dorado County has recognized this flaw and is in the process of correcting the model.

To establish the general integrity of volumes from the model, we compared existing AM and PM peak hour volumes which were collected by David Evans and Associates, Inc. for Highway 50, East Shingle Springs Drive, and the Highway 50/East Shingle Springs Drive freeway ramps to forecasted volumes from the model. Focusing on the PM peak hour, it is noted that Highway 50 west of the East Shingle Springs Drive interchange are projected to experience an annual growth rate between 1.7-4.3%. However, Highway 50 east of the interchange is projected to increase only 0.7-0.9% per year. This helped to confirm that forecasted Highway 50 volumes east of the interchange are very circumspect, and likely too low. To address this error, we increased the volume obtained from the model for Highway 50 east of the interchange. This adjustment was made by establishing reasonable cumulative ramp volumes along Highway 50/East Shingle Springs Drive freeway ramps for cumulative conditions based on both existing peak hour volumes, and projected growth as shown in the model. These ramp volumes were then added and subtracted from Highway 50 volumes west of the Highway 50/East Shingle Springs Drive interchange to establish Highway 50 volumes east of the Highway 50 to Shingle Springs Drive interchange.

5.1.3 Indirect Impacts

Closely related to cumulative impacts are indirect impacts. As defined by NEPA and CEQA, "indirect…effects…are caused by the project and are later in time or farther removed in distance, but are still reasonably foreseeable. Indirect…effects may include growth-inducing effects and other effects related to induced changes in the pattern of land use, population density, or growth rate, and related effects on air and water and other natural systems, including ecosystems" (CEQA Guidelines Section 15358 (2)). See 40 CFR § 1508.8 (b). For purposes of this EIR/EA, Indirect Effects includes the development of the proposed hotel and casino on the Rancheria. If constructed, the proposed interchange (direct subject of this EIR/EA) will allow free and open access to the Rancheria thereby allowing the opportunity for commercial development. The foreseeable consequence of interchange construction is the construction of the hotel and casino on the Rancheria. Chapter 9 of this EIR/EA addresses the indirect impacts of the interchange project.

5.2 Land Use, Zoning, and Adopted Policies

5.2.1 Introduction

This section provides information regarding current land uses, surrounding land uses, applicable plans and policies, El Dorado County's General Plan land use designations, policies, and zoning, and land use policies of the Shingle Springs Rancheria and the State of California (State).

The discussion in this section differs from other sections in this EIR in that consistencies and inconsistencies with adopted local land use plans are addressed as opposed to environmental impacts and mitigation measures. Potential physical environmental impacts of the Proposed Project, including those resulting from inconsistencies with applicable plans and policies, mitigation measures, and project alternatives are discussed in the technical sections of this EIR.

Land use compatibility and consistency with adopted plans are considered social and/or economic considerations. They pertain more to orderly development and the efficient provision of public services, than physical environmental impacts. This is not to say that a given project's failure to comply with applicable land use regulations, or the land use conflicts that a project may create, would not result in adverse impacts on the environment. In fact, socio-economic impacts and physical environmental impacts are often related and can, and often do, have a cause and effect relationship. Both NEPA and CEQA, and the regulations and guidelines that implement these laws, require consideration of social and economic impacts of projects in preparation of environmental documents.

NEPA and CEQA policies state that consideration is to be given to qualitative factors and unquantifiable environmental amenities and values, along with economic and technical considerations in decision-making that may affect the environment. Section 1508.14 of the Council on Environmental Quality (CEQ) implementing regulations for NEPA states that economic or social effects themselves are not intended to require preparation of an Environmental Impact Statement (EIS). However, when an EIS is prepared based on the finding that a given project would result in significant effects, then the document will discus social or economic impacts which are interrelated to a project. Section 15064(e) of the CEQA Guidelines states that economic and social changes resulting from a project shall not be treated as significant effects on the environment. Economic or social changes may be used, however, to determine that a physical change shall be regarded as a significant effect on the environment. Where a physical change is caused by economic or social effects of a

project, the physical change may be regarded as a significant effect in the same manner as any other physical change resulting from the project. Alternatively, economic and social effects of a physical change may be used to determine that the physical change is a significant impact on the environment. If the physical change causes adverse economic or social impact on people, those adverse impacts may be used as a factor in determining whether the physical change is significant.

In light of these statues and their respective guidelines for the treatment of land use impacts, the challenge faced by lead agencies charged with preparing CEQA-NEPA environmental documents is great. In order to help meet this challenge, and satisfy CEQA and NEPA by evaluating/reporting how proposed project land uses will affect the environment as well as the people, institutions, neighborhoods, communities, and larger social and economic system, Caltrans conducted a technical study. This study, known as the *Shingle Springs Rancheria Interchange Project Community Impact Assessment,* examined potential neighborhood impacts, household impacts, environmental justice impacts, regional economic impacts, impacts on local businesses, property value effects, community facilities and services impacts, land use impacts, growth inducement, and cumulative impacts of the project area (**Figure 5.2-1**) and the region.

Consistencies and/or inconsistencies of the Proposed Project with the adopted plans, as well as findings and recommendations from the land use technical study are discussed below.

5.2.2 Existing Land Uses

The project site consists of land owned by the Tribal Government and the State. The Tribal land consists of a 5±-acre parcel that currently contains a single-family residence and an accessory building on the northern half of the site. The remainder of this parcel is vacant consisting of mixed-oak woodlands and annual grassland. The State property contains a portion of U.S. Highway 50 and undeveloped portions of its right-of-way.

Surrounding land uses are rural residential, agricultural residential (e.g. small livestock grazing and animal husbandry), and open space located on relatively large parcels ranging from 5 to 20 acres. Parcels of eighty acres and larger are located in the project vicinity, including the 160-acre Shingle Springs Rancheria and several low-density residential ranchettes (**Figure 5.2-2**). There are no major urban developments or commercial land uses in the area. There are no industrial land uses, with the exception of the Southern Pacific Railroad (currently not in use), which runs parallel to Highway 50 south of the project site.

See Figure 5.2-1

5.2.3 Applicable Land Use Designations, Goals And Policies

Any discussion of goals and policies with regard to land use in the study area must include mention of the fact that the land use regulations of the County of El Dorado do not apply to Tribal trust land (i.e. the Shingle Springs Rancheria). Likewise, land use regulations or policies of the Tribal government do not apply to lands within jurisdictional El Dorado County. Since discretionary approvals by Caltrans and the BIA are required for the Proposed Project, goals and policies of these two agencies are clearly applicable.

County Of El Dorado General Plan

The 1996 El Dorado County General Plan is a 20-year policy guide for the growth and development of the County of El Dorado. The General Plan acts as the overall guiding policy document for land uses in the County and is the principal tool for evaluating public and private projects. The County's goals and policies with regard to land use are contained in the Land Use Element of the General Plan. State law mandates the Land Use Element.

Goals And Policies

The project site and majority of the study area (excluding the Rancheria) are designated as "Low-Density Residential" (5 to 20 acres per dwelling unit) on the Land Use Map of the 1996 El Dorado County General Plan **(Figure 5.2-2)**. The General Plan contains the following policies regarding this designation:

Policy 2.2.1.2

To provide for an appropriate range of land use types and densities within the County, the following General Plan land use designations are established and defined.

<u>Low-Density Residential (LDR)</u>: This land use designation establishes areas for single-family residential development in a rural setting. In Rural Regions, this designation shall provide a transition from Community Regions and Rural Centers into the agricultural, timber, and more rural areas of the County and shall be applied to those areas where infrastructure such as arterial roadways, public water, and public sewer are generally not available. This land use designation is also appropriate within Community Regions and Rural Centers where higher density serving infrastructure is not yet available. The maximum allowable density shall be one dwelling unit per 5.0 acres. Parcel size shall range from 5.0 to 10.0 acres. Within Community Regions and Rural Centers, the LDR designation shall remain in effect until a

See Figure 5.2-2

specific project is proposed that applies the appropriate level of analysis and planning and yields the necessary expansion of infrastructure.

Policy 2.2.1.3

The General Plan provides for the following range of population densities in the respective land use designation based upon the permitted range of dwelling units per acre and number of persons per acre as shown in **Table 5.2-1**.

Table 5.2-1 Land Use Densities and Residential Population Ranges

Land Use Designation	Units per Acre	Persons per Housing Unit	Persons per Acre
Medium-Density Residential	1 - 0.2	2.8	2.8
Low-Density Residential	0.20 - 0.1	2.8	0.56 - 0.28

Source: 1990 U.S. Census
[1] Maximum of 10 units per acre in Community Regions; maximum of 4 units per acre in Rural Centers

The Shingle Springs Rancheria is designated as "Non-Jurisdictional" on the Land Use Map of the 1996 El Dorado County General Plan. The General Plan contains the following policy:

Policy 2.2.2.5

The purpose of the *Non-Jurisdictional Lands (-NJ)* overlay designation is to identify the incorporated cities of Placerville and South Lake Tahoe within the County, other lands under Federal and State ownership, and the Shingle Springs Rancheria. Local land use planning within these areas is the responsibility of that government entity.

It is anticipated that the project site would receive the same designation if it is accepted into the Indian Reservation Road System (IRR) and title is conveyed to the United States.

5.2.4 Shingle Springs Rancheria Land Use And Environmental Management Plans

The Shingle Springs Rancheria land use plans and Environmental Management Plan are the governing policies for the growth and development on Tribal lands. They are the basis for which all proposed Tribal projects are evaluated.

Goals And Policies

Consistent with its goals and policies of providing direct access to the Rancheria property, increasing employment opportunities and self-reliance for its members, and providing for the general welfare of its members, the Rancheria's plan for the project site is to construct an interchange to provide unrestricted access. The Shingle Springs Rancheria Environmental Management Plan contains the following goals:

1.1 Environmental Management Program Goal

To allow the Tribe to meet the needs of its members in an environmentally sensitive manner.

3.5 Transportation Goal

Provide a safe, efficient, open, and environmentally sensitive transportation system for the movement of people and goods throughout the Rancheria.

5.2.5 Other Policies

It is the policy of Caltrans to approve only those projects that are consistent with SACOG's MTP and associated MTIP. While the commercial land use proposed for the Rancheria (i.e., hotel and casino) are included in the updated land use data set used by SACOG, the proposed interchange is not currently in the MTIP. The Tribal Government has recently been informed by SACOG that the proposed interchange is within the alternative being considered for the next MTIP Amendment. In order to officially be in the MTIP, an air quality conformity analysis needs to be undertaken and approved. A project level air quality conformity analysis has been undertaken for the proposed interchange and the results reveal that inclusion into the MTIP will not violate air quality standards (see Chapter 5.5 Air Quality for further discussion).

It is the policy of the BIA to conduct all federal actions, including accepting land into trust and roads into the IRR, in accordance with NEPA. The BIA will make the proposed interchange a part of the IRR system once the facility is constructed. The IRR Program is a jointly administered program by the Federal Highway Administration and by the BIA; through an Interagency Memorandum of Agreement as established by Title 23 U.S.C. Section 204. The BIA will not take actions that result in the exposure of people to hazardous materials, result in the loss of important farmland, or otherwise harm the environment.

5.2.6 Ordinances

County Of El Dorado

The parcel currently owned by the Tribal Government, as well as a majority of the study area, are located within the "Estate Residential Five-Acre" (RE-5) zoning district. Uses permitted by right include single-family houses, guest houses, barns and other agricultural structures, home occupations, and packing and processing of agricultural products. Uses allowed by use permit include mining or drilling of minerals or petroleum, golf courses, airports, kennels, and community care facilities. It is anticipated that the 5± acre parcel would be assigned unclassified status by the County if the proposed interchange is accepted into the IRR system and converted to Federal trust status.

Shingle Springs Rancheria

The Tribal Council plans to develop commercial uses in the southwestern portion of the Rancheria if the interchange is approved by Caltrans and the CTC. Other areas of the Rancheria are planned for residential uses. The residential uses are divided into single family and multi-family sites. The residential parcels are sized to be roughly 2-acres and larger.

5.2.7 Land Use Consistency And Compatibility

The proposed interchange would result in a change from the current planned land use (i.e. residential) for the 5-acre parcel leading from the Highway to the Rancheria. Approximately four acres of the project site is located within the Highway 50 ROW (excluding the existing developed highway segment). The planned land use for this area is transportation facilities and maintenance. This component of the project would not represent a departure from the current planned land use. If approved, the overall project, which includes an IRR designation of the interchange, would not be inconsistent with planned tribal uses.

5.2.8 Thresholds Of Significance

Project impacts are considered significant if they would: (1) conflict with applicable land-use plan, policy or regulation of any agency with jurisdiction over the project; (2) conflict with applicable habitat conservation plan or natural community conservation plan; (3) conflict with adopted policies, plans or programs supporting alternative transportation; or (4) result in significant land use conflicts.

5.2.9 Assessment

The connection between the Highway 50 interchange and the Rancheria would be placed into the IRR system. As such, the use of the property within the roadway ROW would not be subject to local land use controls. Because the Rancheria land use is not subject to, or included in the County of El Dorado General Plan process, access to the Rancheria from Route 50 is not provided for within the Circulation Element of the County's General Plan.

However, the interchange leading up to the Rancheria will not permanently impact local roadways or prevent local roadways/land from being improved or otherwise modified in the future (see Section 5.4 of this EIR/EA). Consequently, the interchange project is not inconsistent with the Circulation Element of the County of El Dorado General Plan.

The proposed interchange is not inconsistent with the El Dorado County General Plan, as the parcel would no longer be under County jurisdiction. There are no applicable resource or habitat conservation plans that apply to the project site. Additionally, there are no applicable plans, policies, or programs supporting alternative transportation.

Since the Proposed Project would occur entirely within land under federal, state, or tribal jurisdiction, there are no applicable County plans, policies, or regulations that would apply. The project is consistent and, in fact, implements planned land uses on the Rancheria. Regardless of current or future land use designations or compliance with land use plans, the actual proposed use would result in few, if any, land use conflicts due to the rural residential nature of the area and the large parcel sizes that buffer surrounding properties. As such, there are no inconsistencies with regard to land use.

The proposed interchange project is not specifically identified on the list of projects contained in SACOG's MTIP. The Shingle Springs Rancheria has not historically been represented on the SACOG Board, and as such, their access needs have not been addressed by SACOG's member jurisdictions. The inclusion of the interchange into the BIA's IRR System makes it eligible for inclusion into the MTIP. The Tribal Government has already been notified that the proposed interchange will be included in SACOG's next amendment process expected to occur in early 2002. Inclusion of the proposed interchange into the IRR System, and therefore the MTIP, will make the project consistent with the SIP process. The proposed interchange cannot be approved until it is a component of the SACOG MTIP.

5.3 Geology And Soils

5.3.1 Introduction

The Geology section of the EIR/EA analyzes the potential short-term, long-term, and cumulative impacts resulting from the construction and operation of the Proposed Project and alternatives. The geology discussion will analyze the geological conditions in the proposed Shingle Springs Interchange region.

5.3.2 Environmental Setting

Regional Geology

Low hills and rounded knobs ranging in elevation 1,400 feet (427 m) and 1,600 feet (488 m) above sea level (asl) characterize landforms that surround the project area. Low eroded bedrock features and shallow deposits of alluvial material control topography. At the project site, the Highway 50 road cut exposes the metamorphosed (altered through pressure and heat) volcanic rocks that are part of extensive, north-south trending metamorphic rock belts that underlie portions of the Sierra Foothills. Described as a melange belt, this chaotic mixture of metamorphic rocks was formed through prolonged heating and recrystallization of sedimentary rocks about 150 million years ago (Wagner, 1987). These formations were then intruded by molten magma that crystallized as large masses of granite. Specifically, the bedrock in this region is recognized as part of an island arc formed during mountain building of the Sierra Nevada between 136 and 190 million years ago (Loyd, 1983).

Project Site Geology

Metamorphosed volcanic rocks, recrystallized into greenstone schists and other altered igneous rocks, comprise the bedrock underlying the proposed interchange site [1]. This pressure and stress of metamorphism has resulted in numerous fractures and joints that tend in a nearly north direction and are tilted approximately vertical. Serpentinite, or rock containing the mineral serpentine, is abundant in the melange belts of the Sierra foothills, the Klamath Mountains and the Coast Ranges and is typically grayish-blue to bluish black in color sometimes having a greasy or shiny appearance.[2] Serpentinite, generally exposed near faults in the Sierra Foothills, occurs in western El Dorado County and has been mapped within the Proposed Project vicinity (Wagner, 1987). Shallow surficial deposits covering portions of the bedrock in the Proposed Project area are comprised of mixed alluvial sediments (cobbles, sand, silt, and clay) of varying depths.

1 Greenstone is an altered volcanic rock. Shists are crystalline metamorphic rocks commonly formed from fine-grained sedimentary rocks.

2 Serpentinite is a rock consisting almost entirely of serpentine and is derived from alteration of preexisting minerals. Serpentine is a name given to a mineral group that consists of lizardite, chrysotile, and antigorite.

A field survey identified serpentinite (rock containing serpentine minerals) at the west end of the interchange project site. On the north side of Route 50, serpentinite was observed within the road cut extending east about 275 feet (84 m). On the south side of Route 50, what appeared to be the continuation of the serpentinite unit, was visible extending east within the road cut for about 328 feet (100 m). The serpentinite exposures extend vertically, approximately 20 to 25 feet (6 - 7.6 m), from the roadway to the road cut crest.

Serpentine is a name given to a mineral group that consists of lizardite, chrysotile, and antigorite and serpentinite is a rock consisting almost entirely of the mineral serpentine derived from alteration of preexisting minerals.[3] Serpentinite is California's State Rock and is apple-green to black, often mottled with light and dark colored areas. Its surfaces often have a shiny or wax-like appearance and a slightly soapy feel. Serpentine is usually fine-grained and compact but may be granular, platy, or fibrous in appearance. Serpentine occurs in the Coast Ranges of central and northern California, in the Klamath Mountains, and in the Sierra Nevada foothills.

Asbestos is a term applied to a group of silicate minerals that readily separates into thin, strong, and flexible fibers that are heat resistant. Chrysotile in fibrous form is the most common type of asbestos and is often is present in serpentinite. In addition to serpentine minerals, other minerals such as talc, brucite, actinolite, carbonate minerals and magnetite may form as products of the serpentinization process.[4] Tremolite/actinolite asbestos is another common type of asbestos found in California and is found in most Sierra Nevada counties and Klamath Mountains associated with fault or shear zones in serpentinite. Lizardite and antigorite do not form asbestos fibers and instead are plate-like in form.

Because serpentine often contains some asbestos, and exposure to asbestos fibers have potential human-health consequences, the Air Resources Board adopted regulations in 1990 restricting the use of this rock type as an unpaved road surfacing material.

Soils

El Dorado County soils consist of well-drained silt and sandy and gravelly loams divided into two physiographic regions; the Lower and Middle Foothills and the Mountainous Uplands (USDA, 1974). The soils within the project vicinity belong to the Auburn series, which generally consists of well-drained soils underlain by metamorphic rock. Surficial soil overlying the site consist of Auburn very rocky, silt loam, (AxD) on 2 to 30 percent slopes and Auburn very rocky, silt loam (AxE), which is similar to AxD but is found on 30 to 50 percent slopes (**Table 5.3-1**). These soils have a slight to moderate erosion hazard, low expansive potential, and low corrosivity. The use of Auburn soils for road fill is rated fair due to the soils' tendency to erode

3 The term "serpentine" is commonly used by the general public to refer to the rock type that geologists call "serpentinite."

4 California Division of Mines and Geology, *Areas More Likely to Contain Natural Occurrences of Asbestos in Western El Dorado County, California*, Open-File Report 2000-002, 2000.

on slopes, the moderate to high potential frost action, and the low shrink-swell (expansive) capacity. Soils surrounding the Shingle Springs Rancheria include Serpentine Soil, Diamond Springs, and Auburn Silt Loam.

Table 5.3-1 Soils Within the Project Site

Soil Type/Capability Class[1]	Erosion Hazard	Shrink-Swell Potential
AxD AxE Auburn Very Rocky Silt Loam/VI	Slight to Moderate	Low

Source: USDA, Soil Conservation Service, 1974
[1]Capability Class related to choice of plants and conservation practices: I – Few limitations; II – moderate limitations; III – severe limitations; IV – very severe limitations; V – impractical to remove, best for pasture land; VI – severe limitations, unsuited for cultivation; VII – very severe limitations, unsuited for cultivation, VIII – soils and landforms have limitations that preclude use for commercial plants.

Soil Erosion

Soil erosion is the process whereby soil materials are worn away and transported to another area either by wind or water. Rates of erosion can vary depending on the soil material and structure, placement and human activity. Soil containing high amounts of silt can be easily erodible while sandy soils are less susceptible. Erosion is most likely on sloped areas with exposed soil, especially where unnatural slopes are created by cut and fill activities. Soil erosion rates can therefore be higher during the construction phase. Typically, the soil erosion potential is reduced once the soil is graded and covered with concrete, structures or asphalt. The silty loam soils at the project site are considered to have a low to moderate erosion potential. However, the extensive excavation and grading associated with the Proposed Project could potentially result in soil erosion as hillsides are stripped of existing vegetation and the topography is recontoured during construction operations. Excessive soil erosion can eventually lead to damage of roadways and embankments.

Mineral Resources

The California Division of Mines and Geology (CDMG) classifies the regional significance of mineral resources in accordance with the California Surface Mining and Reclamation Act of 1975. Mineral Resource Zones (MRZ) have been designated to indicate the significance of mineral deposits. The MRZ categories are as follows:

MRZ-1 Areas where adequate information indicates that no significant mineral deposits are present, or where it is judged that little likelihood exists for their presence.

MRZ-2 Areas where adequate information indicates that significant mineral deposits are present, or where it is judged that a high likelihood exists for their presence.

MRZ-3 Areas containing mineral deposits the significance of which cannot be evaluated from available data.

MRZ-4 Areas where available information is inadequate for assignment to any other MRZ.

The El Dorado County General Plan Land Use Map does not identify the project site as a Mineral Resource (MR) area. There are mineral resource areas, primarily along the Deer Creek drainage, that are classed MRZ-3 for Placer gold and chromite deposits (CDMG, 1984). Deer Creek is located approximately 6 miles southwest of the project site.

Seismicity

Earthquakes on the various active and potentially active San Francisco Bay Area, Central Valley and Sierra Nevada fault systems are expected to produce a wide range of ground shaking intensities within the Shingle Springs area.[5] The 1997 Uniform Building Code (UBC) locates the project area within Seismic Risk Zone 3 meaning that risks from earthquakes are somewhat less compared to the San Francisco Bay Area that is considered within Seismic Risk Zone 4. For reference, the 1906 and 1989 earthquakes on the San Andreas Fault generated shaking in El Dorado County; however, local damage was limited.

Faults in the nearby vicinity are related to the Foothills Fault Zone, which includes the Bear Mountain Fault Zone and the Melones Fault Zone in the Sierra Nevada foothills located east of the Proposed Project area. In addition to these local faults, several large active earthquake faults are located in the Central Valley region, between 30 to 65 miles away, and in the San Francisco Bay Area, over 70 miles away. **Table 5.3-2** describes the location of nearby faults and provides information, where available, on the magnitude of the most recent activity on the faults. The estimated maximum (moment) magnitudes represent *characteristic* earthquakes on particular faults.[6]

Surface Fault Rupture

Seismically induced ground rupture is defined as the physical displacement of surface deposits in response to an earthquake's seismic waves. The magnitude, sense, and nature of fault rupture can vary for different faults or even along different strands of the same fault. Future faulting is generally expected along different strands of the same fault (CDMG, 1997a). Ground rupture is

5 The State of California defines an active fault as a fault that has had surface displacement within Holocene time (approximately the last 10,000 years) defines. A *potentially active* fault is defined as a fault that has shown evidence of surface displacement during the Quaternary (last 1.6 million years), unless direct geologic evidence demonstrates inactivity for all of the Holocene or longer. This definition does not, of course, mean that faults lacking evidence of surface displacement are necessarily inactive. *Sufficiently active* is also used to describe a fault if there is some evidence that Holocene displacement occurred on one or more of its segments or branches (Hart, 1997).

6 Moment magnitude is related to the physical size of a fault rupture and movement across a fault. Richter magnitude scale reflects the maximum amplitude of a particular type of seismic wave. Moment magnitude provides a physically meaningful

considered more likely along active faults, which are referenced above. The Project site is not within an active fault rupture hazard zone as defined by the Alquist-Priolo Earthquake Fault Zoning Act (discussed below). Since no mapped active or potentially active faults are known to pass through the project site, the potential risk from fault rupture is considered low.

Table 5.3-2 Active and Potentially Active Regional Faults

Fault	Location to Shingle Springs	Recency of Faulting	Maximum Moment Magnitude Earthquake[B]
Foothills Fault Zone Bear Mountain FZ New Melones FZ	2 miles W 6 miles E	1.8 mya - Present	6.5
Cleveland Hill	42 miles N	.01 mya - Present	6.5
Dunnigan Hills	46 miles WNW	11,000 - Present	6.3
Concord-Green Valley	72 miles SW	.01 mya - Present	6.9
Hunting Creek	78 miles WNW	11,000 - Present	6.9
Rio Vista	44 miles SW	1.8 mya - Present	NA
Stampede Valley	57 miles E	1.8 mya - Present	NA
Genoa	59 miles E	11,000 - Present	NA
Vaca Fault	46 miles W	1.8 mya - Present	NA

Source: Jennings, 1994, Bryant, 2000, Hart, 1997, Peterson, 1996.

A An active fault is defined by the State of California as a fault that has had surface displacement within Holocene time (approximately the last 10,000 years). A potentially active fault is defined as a fault that has shown evidence of surface displacement during the Quaternary (last 1.6 million years), unless direct geologic evidence demonstrates inactivity for all of the Holocene or longer. This definition does not, of course, mean that faults lacking evidence of surface displacement are necessarily inactive. Sufficiently active is also used to describe a fault if there is some evidence that Holocene displacement occurred on one or more of its segments or branches (Hart, 1997).

B The Maximum Moment Magnitude is an estimate of the size of a characteristic earthquake capable of occurring on a particular fault. Moment magnitude is related to the physical size of a fault rupture and movement across a fault. The Maximum Moment Magnitude Earthquake (Mw), derived from the joint CDMG/USGS Probabilistic Seismic Hazard Assessment for the State of California, 1996. (CDMG OFR 96-08 and USGS OFR 96-706).

mya= Million Years Ago

Ground Shaking

Ground shaking can be described in terms of peak acceleration, peak velocity, and displacement of the ground.[7] Areas that are underlain by bedrock, such as the project site, tend to experience less amplification of ground shaking than those underlain by unconsolidated sediments such as alluvial materials or artificial fill. Ground shaking may affect areas for hundreds of miles around a fault. According to CDMG Probabilistic Seismic Hazard Maps (10% probability of exceedance in 50 years), maximum peak ground acceleration in the Shingle Springs area during an

[7] Peak Ground Acceleration is the maximum horizontal ground movement expressed as acceleration due to gravity or approximately 980 centimeters per second.

earthquake on one of the active or potentially active Bay Area, Central Valley, or Sierra faults could range from 0.1g to 0.2g[8] (Peterson, et.al, 1996). The probability level estimated by the CDMG maps provides engineers criteria to design buildings for larger ground motions than seismologists believe will occur during a 50-year interval, thereby making buildings safer than if they were only designed for the ground motions that are expected to occur in the next 50 years (see footnote 6; CDMG, 1999). For reference, the peak ground acceleration actually recorded at the epicenter of the 1989 Loma Prieta earthquake in Santa Cruz was 0.64g and the highest peak ground acceleration recorded on the San Francisco Peninsula for that earthquake was 0.33g. In comparison, the Caltrans Seismic Hazard Map estimates the region encompassing the Project site could experience a maximum peak ground acceleration of 0.5g (Caltrans, 1996). The Caltrans values are higher because the method Caltrans engineers use to estimate ground motion is inherently conservative, in consideration of public safety and critical structures such as highway bridges (Caltrans, 1996).

The Modified Mercalli Intensity (MMI) scale (**Table 5.3-3**) is a common measure of earthquake effects due to ground shaking intensity. The MM values for intensity range from I (earthquake not felt) to XII (damage nearly total), and intensities ranging from IV to X could cause moderate to significant structural damage.[9] Maximum peak ground acceleration intensities at the site are expected to cause strong MMI (VII) ground shaking. Ground shaking effects of this intensity include moderate structural damage to ordinary buildings, but negligible damage to buildings of good design and construction.

Landslides

A landslide is a mass of rock, soil, and debris displaced down-slope by sliding, flowing, or falling. The susceptibility of land (slope) failure is dependent on slope and geologic characteristics, as well as the amount of rainfall and the nature of excavation or seismic activities. Areas with steep slopes and downslope creep of surface materials are most susceptible to landsliding. Landslides are least likely in areas of low relief, such as topographically low alluvial fans. Slope instability and landslides can occur from construction activities and grading

8 "A probabilistic seismic hazard map is a map that shows the hazard from earthquakes that geologists and seismologists agree could occur in California. It is probabilistic in the sense that the analysis takes into consideration the uncertainties in the size and location of earthquakes and the resulting ground motions that can affect a particular site. The maps are typically expressed in terms of probability of exceeding a certain ground motion. For example, maps illustrating the 10% probability of exceedance in 50 years depict an annual probability of 1 in 475 of being exceeded each year. This level of ground shaking has been used for designing buildings in high seismic areas. The maps for 10% probability of exceedance in 50 years show ground motions that seismologists do not think will be exceeded in the next 50 years. In fact, there is a 90% chance that these ground motions will NOT be exceeded. Seismic shaking maps are prepared using consensus information on historical earthquakes and faults. These levels of ground shaking are used primarily for estimating potential economic losses and preparing emergency response" (CDMG, 1999).

9 The damage level represents the estimated overall level of damage that will occur for various MM intensity levels. The damage, however, will not be uniform. Some buildings will experience substantially more damage than this overall level, and others will experience substantially less damage. Not all buildings perform identically in an earthquake. The age, material, type, method of construction, size, and shape of a building all affect its performance (ABAG, 1998).

operations on hillsides. Removing the lower portion (the toe) of a slope decreases or eliminates the support that opposes lateral motion in a slope. Newly graded slopes can be subject to landslide hazards from over-steepened slope construction, or by seismic ground shaking.

Table 5.3-3 Modified Mercalli Intensity Scale

Intensity Value	Intensity Description	Average Peak Acceleration
I.	Not felt except by a very few persons under especially favorable circumstances.	< 0.0015 g
II.	Felt only by a few persons at rest, especially on upper floors on buildings. Delicately suspended objects may swing.	< 0.0015 g
III.	Felt quite noticeably indoors, especially on upper floors of buildings, but many persons do not recognize it as an earthquake. Standing motor cars may rock slightly. Vibration similar to a passing of a truck. Duration estimated.	< 0.0015 g
IV.	During the day felt indoors by many, outdoors by few. At night, some awakened. Dishes, windows, doors disturbed; walls make cracking sound. Sensation like heavy truck striking building. Standing motor cars rocked noticeably.	0.015 g-0.02 g[a]
V.	Felt by nearly everyone, many awakened. Some dishes, windows, etc., broken; a few instances of cracked plaster; unstable objects overturned. Disturbances of trees, poles, and other tall objects sometimes noticed. Pendulum clocks may stop.	0.03 g-0.04 g
VI.	Felt by all, many frightened and run outdoors. Some heavy furniture moved; a few instances of fallen plaster or damaged chimneys. Damage slight.	0.06 g-0.07 g
VII.	Everybody runs outdoors. Damage negligible in buildings of good design and construction; slight to moderate in well-built ordinary structures; considerable in poorly built or badly designed structures; some chimneys broken. Noticed by persons driving motor cars.	0.10 g-0.15 g
VIII.	Damage slight in specially designed structures; considerable in ordinary substantial buildings, with partial collapse; great in poorly built structures. Panel walls thrown out of frame structures. Fall of chimneys, factory stacks, columns, monuments, walls. Heavy furniture overturned. Sand and mud ejected in small amounts. Changes in well water. Persons driving motor cars disturbed.	0.25 g-0.30 g
IX.	Damage considerable in specially designed structures; well-designed frame structures thrown out of plumb; great in substantial buildings, with partial collapse. Buildings shifted off foundations. Ground cracked conspicuously. Underground pipes broken.	0.50 g-0.55 g
X.	Some well-built wooden structures destroyed; most masonry and frame structures destroyed with foundations; ground badly cracked. Rails bent. Landslides considerable from river banks and steep slopes. Shifted sand and mud. Water splashed (slopped) over banks.	> 0.60 g
XI.	Few, if any, (masonry) structures remain standing. Bridges destroyed. Broad fissures in ground. Underground pipelines completely out of service. Earth slumps and land slips in soft ground. Rails bent greatly.	> 0.60 g
XII.	Damage total. Practically all works of construction are damaged greatly or destroyed. Waves seen on ground surface. Lines of sight and level are distorted. Objects are thrown upward into the air.	> 0.60 g

Source: Bolt, Bruce A., *Earthquakes*, W. H. Freeman and Company, New York, 1988

[a]g is gravity = 980 centimeters per second squared. Acceleration is scaled against acceleration due to gravity or the acceleration with which a ball falls if released at rest in a vacuum (1.0g). Acceleration of 1.0g is equivalent to a car traveling 100 meters (328 feet) from rest in 4.5 seconds.

5.3.3 Regulatory Setting

Alquist-Priolo Earthquake Fault Zoning Act

The Alquist-Priolo Earthquake Fault Zoning Act (formerly the Alquist-Priolo Special Studies Zone Act), signed into law December 1972, requires the delineation of zones along active faults in California. The purpose of the Alquist-Priolo Act is to regulate development on or near fault traces to reduce the hazard of fault rupture and to prohibit the location of most structures for human occupancy across these traces. Cities and counties must regulate certain development projects within the zones, which includes withholding permits until geologic investigations demonstrate that development sites are not threatened by future surface displacement (Hart, 1997). Surface fault rupture is not necessarily restricted to the area within an Alquist-Priolo Zone.

Seismic Hazards Mapping Act

The Seismic Hazards Mapping Act was developed to protect the public from the effects of strong ground shaking, liquefaction, landslides, or other ground failure, and from other hazards caused by earthquakes. This act requires the State Geologist to delineate various seismic hazard zones and requires cities, counties, and other local permitting agencies to regulate certain development projects within these zones. Before a development permit is granted for a site within a seismic hazard zone, a geotechnical investigation of the site must be conducted and appropriate mitigation measures incorporated into the project design.

California Building Code

The California Building Code is another name for the body of regulations known as the California Code of Regulations (CCR), Title 24, Part 2, which is a portion of the California Building Standards Code (CBSC, 1995). Title 24 is assigned to the California Building Standards Commission, which, by law, is responsible for coordinating all building standards. Under state law, all building standards must be centralized in Title 24 or they are not enforceable (Bolt, 1988). Published by the International Conference of Building Officials, the Uniform Building Code is a widely adopted model building code in the United States. The California Building Code incorporates by reference the Uniform Building Code (UBC) with necessary California amendments. About one-third of the text within the California Building Code has been tailored for California earthquake conditions (ICBO, 1997).

El Dorado County

The County has rules and regulations to minimize potential erosion hazards associated with construction activities, as described in Chapter 15.14 (Grading, Erosion, and Sediment Control) of the El Dorado County Code. In addition, the Public Health, Safety and Noise Element of the

El Dorado General Plan contains goals, policies and objectives to protect people and structures from geologic and seismic hazards.

California Department of Transportation

Jurisdiction of the California Department of Transportation (Caltrans) includes state and interstate routes within California. Any work within the right-of-way of a federal or state transportation corridor is subject to Caltrans regulations governing allowable actions and modifications to the right-of-way. Caltrans standards incorporate the UBC and California Building Code, and contain numerous rules and regulations to protect the public from seismic hazards such as surface fault rupture, and ground shaking. In addition, Caltrans standards require that projects are constructed to minimize potential hazards associated with cut and fill operations, grading, slope instability, and expansive or corrosive soils, as described in the Caltrans Highway Design Manual (HDM).

5.3.4 Impacts And Mitigation Measures

Significance Criteria

A soils or geologic impact would be considered significant if it would result in any of the following:

- Substantial flooding, erosion, or siltation,
- Exposure of people or structures to geologic hazards, soils and/or seismic conditions so unfavorable that they could not be overcome by special design using reasonable construction and/or maintenance practices.
- Construction on substrate that consists of material subject to liquefaction in the event of ground shaking.
- Construction on excessively steep slopes that could result in slope failure or landslides.
- Deformed foundations from exposure to expansive soils (those characterized by shrink-swell potential).

Methodology

Potential geologic and seismic hazards were assessed. The project site and alternatives were evaluated for consistency with adopted plans and policies, and ordinances, as well as compliance with federal, state and local rules and regulations.

Impact/ Mitigation

Impact 5.3-1 Seismic Groundshaking

AA Under the No Project/Action Alternative, the interchange would not be constructed, and no slope excavation or grading would occur. ***No impact*** will occur under the No Project/Action Alternative.

AB, AC In the event of an earthquake on one of the active or potentially active earthquake faults in the San Francisco Bay region, Central Valley, or the Sierra Nevada, seismic hazards related to ground shaking could occur in the Shingle Springs area. Ground shaking could result in damage and temporary closure of the freeway interchange, and portions of the access roadway. Although ground shaking is anticipated during the life of the project, the ground motions are likely to be less pronounced due to the underlying bedrock at the proposed interchange site. Furthermore, constructing the proposed interchange foundations in competent bedrock would also minimize the potential for failure due to weak or liquefiable soils. Regardless, construction of the Flyover Interchange Design or Diamond Interchange Design will be required to comply with engineering requirements set forth by the Caltrans Seismic Design Criteria that apply conservative estimates of ground motion, restricts construction if underlying geologic (i.e. liquefaction susceptibility) conditions are unacceptable, and integrates appropriate foundation designs. Given that this alternative would incorporate Caltrans engineering criteria, the proposed Flyover interchange is expected to withstand seismic shaking from an earthquake on the regional active and potentially active faults. ***The Flyover Interchange Design Alternative and the Diamond Interchange Design Alternative will not result in a significant impact to the environment from hazards associated with earthquakes or seismic ground shaking.***

Mitigation 5.3-1 Seismic Groundshaking

None Required.

Impact 5.3-2 Slope Instability And Landslide Hazards

AA Under the No Project/Action Alternative, the interchange would not be constructed, and no slope excavation or grading would occur. ***No impact*** will occur under the No Project/Action Alternative.

AB, AC Construction of the proposed on- and off-ramps for Flyover Interchange Design Alternative and Diamond Interchange Design Alternative would require hillside excavation and grading, and would include construction of a tie-back wall and

retaining wall to provide structural support of the bedrock, especially in areas with jointing or fracturing rock. As required by the HDM, a geotechnical design report (GDR) will be prepared for the Proposed Project by Caltrans, or by an independent consultant subject to Caltrans over-sight and technical review. The GDR will include a site-specific geotechnical analysis and provide recommendations and guidelines for all earthwork associated with the project, including slope excavation, tie-back and retaining wall design, and final slope configuration. The development of the proposed Flyover interchange design alternative and Diamond interchange design alternative would be required to comply with Caltrans, and where applicable El Dorado County grading ordinances and UBC standards for design and construction. Compliance with these standards would reduce potential hazards associated with slope instability or landsliding to a less than significant level. ***The Flyover Interchange Design Alternative and Diamond Interchange Design Alternative will not result in a significant impact to the environment as related to slope instability and landslide hazards.***

Mitigation 5.3-2 Slope Instability and Landslide Hazards

None Required.

Impact 5.3-3 Soil Erosion

AA Under the No Project/Action Alternative, the interchange would not be constructed, and no slope excavation or grading would occur. ***No impact*** will occur under the No Project/Action Alternative.

AB, AC Soil erosion hazards could occur during preliminary stages of construction, especially during initial site grading and slope excavation, and prior to construction of the tie-back wall, retaining wall, and paving. In addition to causing sedimentation problems in storm drain systems, rapid water erosion could remove large amounts of topsoil, cause deeply incised gullies on slopes, and undermine paved surfaces. These potential soil erosion hazards would be addressed through compliance with Caltrans standards and construction BMP's required through the NPDES permit. Following standard, site-specific geotechnical engineering studies performed during the design stage, the Caltrans GDR would include erosion control features to be implemented during construction activities. Furthermore, the Proposed Project would be required to comply with grading, erosion and sediment control standards of the El Dorado County Municipal Code (Chapter 15.14), and applicable codes and requirements

of the 1997 UBC with California additions (Title 22). Compliance with these standards would reduce potential hazards associated with soil erosion to a less than significant level. ***The Flyover Interchange Design Alternative and Diamond Interchange Design Alternative are not expected to result in a significant impact to the environment as related to soil erosion.***

Mitigation 5.3-3 Soil Erosion

None Required.

Impact 5.3-4 Excavation of Serpentinite

AA Under the No Project/Action Alternative, the interchange would not be constructed, and no serpentinite would be encountered. ***No impact*** will result from the No Project/Action Alternative.

AB, AC Serpentinite, generally exposed near faults in the Sierra Foothills, occurs in western El Dorado County and has been mapped within the Proposed Project vicinity. Because serpentine often contains some asbestos, and exposure to asbestos fibers have potential human-health consequences, the Air Resources Board adopted regulations in 1990 restricting the use of this rock type as an unpaved road surfacing material. West-bound on-ramp and east-bound off-ramp construction would likely encounter serpentinite (at the west end of the interchange project site) if the road cut slopes on either side of the highway require ripping, grading, drilling or excavation. ***The Flyover Interchange Design Alternative and Diamond Interchange Design Alternative are expected to result in an excavation of rock containing serpentinite, which is considered a significant but mitigable air quality impact.***

Mitigation 5.3-4 Excavation of Serpentinite

The impact identified above will be reduced to a ***less-than-significant*** level with the implementation of the following mitigation:

(A) This impact would be reduced to a less-than-significant level by complying with Chapter 8.44 of Title 8 of the El Dorado County Ordinance Code, “Naturally Occurring Asbestos and Dust Protection Ordinance”. Section 8.44.030 of this ordinance specifically addresses “General Requirements for Grading, Excavation and Construction Activities”.

Section 8.44.030 requires the following:

- An Asbestos Hazard Dust Mitigation Plan.
- Required construction practices, including: wetting work areas, limiting vehicle access, and covering areas with non-asbestos material.

These measures will reduce the potential for asbestos dust from becoming airborne and causing a health hazard.

Impact 5.3-5 Cumulative Impacts

AA The No Project/Action Alternative will not contribute to cumulative geology and soil impacts. ***No cumulative impact*** will result from the No Project/Action Alternative.

AB, AC The only project specific geology and soil impact identified is related to the excavation of serpentinite. The serpentinite impact is related to air quality emissions (asbestos). Cumulative development in El Dorado County may result in the excavation of serpentinite; however, compliance with county regulations would be required. The implementation of air quality Mitigation 5.5-2 will assure that Alternative B and C will not significantly add to the cumulative release of asbestos containing materials. ***Therefore, no cumulative geologic, soils, or seismic impacts are anticipated to occur as a result of the proposed interchange project.***

Mitigation 5.3-5 Cumulative Impacts

None required.

5.4 Transportation/Circulation

5.4.1 Introduction

The analysis investigates existing operations in the vicinity of the proposed interchange, as well as operations in the vicinity of the proposed interchange for cumulative conditions, which for this study is assumed to be the year 2025. The analysis also investigates the traffic operations and impacts associated with the proposed interchange for both existing and cumulative conditions.

A traffic study was developed as part of the technical studies prepared for this EIR. Detailed methodology and assumptions used for this chapter are incorporated by reference from the technical study. The technical study can be reviewed during normal business hours at Caltrans' District 3 Office located at 2800 Gateway Oaks, Sacramento, CA.

5.4.2 Environmental Setting

Existing Setting

Roads

The following roadways are located in the vicinity of the proposed interchange:

US-50 is an east-west freeway, which provides regional access between Sacramento and Placerville, and recreational areas within the southern Lake Tahoe area. In the vicinity of the proposed interchange, US-50 has two lanes in each direction, 10 ft. (3.0 m) paved outside shoulders and 5 ft. (1.5 m) paved inside shoulders, and a 70 ft. (21.3 m) wide grassy median. At present, approximately 45,500 average daily trips occur along US-50 in the vicinity of the proposed interchange.

East Shingle Springs Drive is a 2-lane rural roadway, which runs in a north-south direction immediately west of the proposed interchange. The roadway begins within the gated residential community immediately north of US-50 and Rock Barn Road, and continues south of US-50 approximately 1 mile (1.5 km) to Buckeye Road, where the roadway terminates. At present, the average daily traffic along the roadway is less than 1,000 vehicles per day. E. Shingle Springs Drive is maintained by the County of El Dorado up to the private gate immediately north of US-50 and Rock Barn Road.

Greenstone Road is a 2-lane rural roadway which runs in a north-south direction immediately east of the proposed interchange. The roadway begins approximately 1 mile

north of US-50 at Green Valley Road, and continues south of US-50 a few miles to Mother Lode Drive. At present, the average daily traffic along the roadway is approximately 2,000 vehicles per day north of US-50, and less than 1,000 vehicles per day south of US-50. There are no sidewalks and minimal or non-existent shoulders along the roadway, and the roadway width is approximately 24 feet (7.2 m). Greenstone Road is maintained by the County of El Dorado.

Grassy Run Road, **Rolling Rock Road**, and **Reservation Road** comprise the route which is currently used to access the Shingle Springs Rancheria. The construction of the new interchange will result in the rerouting of a significant percentage of Rancheria traffic currently using these roadways to the new interchange. To access the Rancheria today, traffic turns left from Greenstone Road to Grassy Run Road. A few hundred feet west of Greenstone Road, Grassy Run Road transitions from a County road to a private residential roadway. Rancheria bound traffic continues along the private roads of Rolling Rock Road and Reservation Road. A count of traffic along the route currently used to access the site was conducted early 1999, and showed that during the PM peak hour approximately 15 inbound vehicles and 7 outbound vehicles were traveling to and from the Rancheria (and adjacent private development). All three of these roads are narrow 2-lane roadways with no sidewalk or shoulder, and contain extreme horizontal and vertical curvature.

Existing Traffic Volumes

Peak Hour Volumes

Existing weekday AM and PM peak hour and Saturday peak hour counts along US-50 were established using the following resources:

1) Raw 1999 Caltrans Traffic counts from their count station on US-50 between the Cameron Park Drive and Ponderosa Road interchanges (Caltrans does not maintain a count station in the immediate vicinity of the proposed interchange).

2) *Caltrans' 1998 Traffic Volumes on California State Highways* (including "Peak Hour Volume Data by Direction".

3) Peak hour ramp counts at the US-50/East Shingle Springs Drive interchange.

4) 7-day/24-hour roadway tube counts along East Shingle Springs Drive south of US-50.

Table 5.4-1 provides a summary of existing freeway volumes along US-50 for all three peak hour scenarios.

Table 5.4-1 Existing No Project Peak Hour Volumes

Freeway Segment	AM Peak Hour	PM Peak Hour	Saturday Peak Hour
Eastbound US-50 (between E. Shingle Springs & Greenstone)	1,229	2,407	1,872
Westbound US-50 (between Greenstone & E. Shingle Springs)	2,206	1,589	1,691
TOTAL	**3,435**	**3,996**	**3,563**

Source: David Evans and Associates, 2001.

Daily Volumes

Existing daily volumes as reported for the local roads analysis is based on traffic counts as reported within El Dorado County Department of Transportation's "*2000 Traffic Count Annual Summary*." These counts were supplemented as necessary from additional traffic counts supplied by the El Dorado County Department of Transportation, the 1994 Regional Transportation Plan for El Dorado County. All older counts which were used were increased to reflect 2000 counts.

Volumes along Caltrans facilities were obtained from "*2000 Caltrans Traffic Volume on California State Highways*" data as included on Caltrans' web site.

Level of Service Concept

The operating conditions experienced by motorists are described as "levels of service" (LOS). Level of service is a qualitative measure of the effect of a number of factors, including speed and travel time, traffic interruptions, freedom to maneuver, driving comfort and convenience. Levels of service are designated "A" through "F" from best to worst, which cover the entire range of traffic operations that might occur. Levels of service "A" through "E" generally represent traffic volumes at less than roadway capacity, while LOS "F" represents over capacity and/or forced flow conditions.

Existing Freeway Mainline Operations

Traffic operations were evaluated for existing weekday AM peak hour, PM peak hour, and Saturday peak hour conditions.

Table 5.4-2 shows the current freeway mainline operations for all three peak hour scenarios.

Table 5.4-2 Existing No Project Freeway Mainline Level of Service

Freeway Segment	AM Peak Hour	PM Peak Hour	Saturday Peak Hour
Eastbound US-50 (between E. Shingle Springs & Greenstone)	B	D	C
Westbound US-50 (between Greenstone & E. Shingle Springs)	D	C	C

Source: David Evans and Associates, 2001.
Notes: (1) Free Flow speed varies - "Ideal" Free Flow Speed of 65 mph adjusted to account for specific highway geometry.
(2) The *Route 50 Transportation Concept Report* states that the concept level of service for US-50 between Sacramento and Placerville is LOS E.

As the above table shows, the freeway currently operates acceptably at LOS D along the eastbound direction during the PM peak hour, and along the westbound direction during the AM peak hour. During the Saturday peak hour, and along the opposing non-peak direction of travel during weekday AM and PM peak hours, the freeway operates acceptably at LOS C or better.

Accident Analysis

To establish potential safety issues and accident potential along US-50 in the vicinity of the new interchange, an analysis of accidents over the past 4 years was conducted along US-50 between the East Shingle Springs Drive and Greenstone Road interchanges, which are located approximately 1 mile (1.5 km) west and east of the proposed interchange, respectively.

Table 5.4-3 provides an annual and 4-year summary of accidents occurring along US-50 between East Shingle Springs Drive and Greenstone Road. The table shows a total of 27 accidents occurred along this freeway segment during the 4 year period between January 1, 1997 and December 31, 2000. The table also shows that no particular type of accident, or roadway conditions or factors contributing to accidents, are significantly higher than any of the other accident types, or contributing roadway conditions or factors.

The section of US-50 in the vicinity of the proposed interchange does not experience a high number of any particular type of accidents, a high number of accidents due to any particular roadway condition, or a higher rate of accidents than that which occurs along similar types of facilities.

Table 5.4-3 Accident Rate

Total Accidents (4 years)[1]	27 accidents
Total Fatalities (4 years)	0 fatalities
Distance (E Shingle Springs to Greenstone)	1.89 miles
Daily Average Daily Traffic Volume[1]	Year 1997 to 1999: 43,300 veh/day Year 2000: 43,000 veh/day
4 Year Volume	63.1085 million-vehicles
Actual Accident Rate	**0.23 accidents/million-vehicle-miles**
Average Accident Rate for Similar Facility[1]	**0.60 accidents/million-vehicle-miles**

Source: David Evans and Associates, 2001.
Notes: (1) Caltrans accident summary printout.

Cumulative (2025) Setting

Cumulative Roadway Network

The roadway network in the immediate vicinity of the project site is assumed to remain the same for Cumulative Conditions as that which currently exists for Existing Conditions. Caltrans currently has no programmed improvement for US-50 for Cumulative Conditions, although there are currently discussions to either provide an HOV lane along the freeway, and/or 6 standard lanes along the freeway. Within this analysis, it is assumed that US-50 will remain a 4-lane facility.

The cumulative roadway network analyzed for the local roads analysis was established in coordination with El Dorado County traffic engineering personnel. Local roadways which were analyzed were those identified as "major roadways," which are defined as those roadways identified on both the *"El Dorado County General Plan Circulation Map,"* and within the roadway network contained within the 1999 version of the *"El Dorado County Travel Demand Forecasting Model"* in MINUTP. Cumulative year roadway geometrics are based on the roadway network geometries included within the 2022 CIP (Capitol Improvement Program) data network files contained with the 1999 El Dorado County travel demand model.

Cumulative Background Volumes

Detailed methodology and assumptions used to establish cumulative background volumes were established in the detailed traffic study developed for the EIR technical studies. The methodology and assumptions used to establish cumulative background volumes are incorporated by reference from the technical study. The technical study can be reviewed during normal business hours at Caltrans' District 3 Office located at 2800 Gateway Oaks, Sacramento, CA.

Peak Hour Volumes

Table 5.4-4 provides a summary of cumulative (2025) freeway volumes along US-50 for all three peak hour scenarios.

Table 5.4-4 Cumulative No Project Peak Hour Volumes

Freeway Segment	AM Peak Hour	PM Peak Hour	Saturday Peak Hour
Eastbound US-50 (between E. Shingle Springs & Greenstone)	2,150	3,441	2,681
Westbound US-50 (between Greenstone & E. Shingle Springs)	3,086	2,316	2,465
TOTAL	**5,236**	**5,757**	**5,146**

Source: David Evans and Associates, 2001.

Cumulative Freeway Mainline Operations

Table 5.4-5 shows the freeway mainline operations that are projected for all three peak hour scenarios for a 4-lane facility.

Table 5.4-5 Cumulative No Project (4-lanes) Freeway Mainline Level of Service

Freeway Segment	AM Peak Hour	PM Peak Hour	Saturday Peak Hour
Eastbound US-50 (between E. Shingle Springs & Greenstone)	D	E	E
Westbound US-50 (between Greenstone & E. Shingle Springs)	E	D	D

Source: David Evans and Associates, 2001.
Notes: (1) Free Flow speed varies - "Ideal" Free Flow Speed of 65 mph adjusted to account for specific highway geometry.
(2) The *Route 50 Transportation Concept Report* states that the concept level of service for US-50 between Sacramento and Placerville is LOS E.

As the above table shows, if US-50 remains a 4-lane facility without any auxiliary lanes, the freeway is projected to operate acceptably at LOS E along the eastbound direction during the weekday PM peak hour and Saturday peak hour, and along the westbound direction during the AM peak hour. The levels of service along the opposing direction during all three peak hours are also projected to operate acceptably at LOS D.

5.4.3 Impacts And Mitigation Measures

CEQA Significance Criteria

The target level of service for this analysis is based primarily on *Caltrans' State Route 50 Transportation Concept Report*, issued in April, 1998, which states that the concept level of service for US-50 between Sacramento and Placerville is LOS E. LOS below this level (LOS "F") would be considered an unacceptable condition for CEQA purposes. There are generally accepted numeric (or alpha (A - F)) significance criteria for CEQA purposes but not for NEPA purposes.

Freeway Mainline and Freeway Ramps

At the direction of Caltrans staff, the concept level of service for freeway mainline and freeway ramp merge analysis is LOS E, thus LOS "F" is considered unacceptable for CEQA purposes on freeway mainline and merge analyses.

The target level of service for freeway ramp diverge analysis is a reduced LOS D, thus LOS "E" or "F" is considered unacceptable for CEQA purposes on diverge analyses.

Study Intersections

In terms of the new intersections which may be a part of the proposed interchange, the applicable target level of service criteria for the new intersections would likely need to conform to Caltrans level of service standards for CEQA purposes. Using Caltrans concept level of service criteria as described above, LOS D would logically be used as the CEQA target level of service for new intersections.

However, intersection levels of service should also be checked against the target level of service criteria established for El Dorado County. The 1996 El Dorado County General Plan states the following in Policy 3.5.1.1:

> *The County shall adopt a roadway plan consistent with planned land use and shall maintain an operating Level of Service of 'E' or better on all roadways, consistent with Objective 3.5.1. In addition, all road segments projected in the roadway plan at the year 2015 to be operating at LOS A, B, or C shall not be allowed to fall below LOS C and all road segments at LOS D shall not fall below LOS D.*

Therefore, LOS "C" is regarded as the target LOS for the newly created intersections. LOS below this level (LOS "D", "E" or "F") is considered an unacceptable condition for the CEQA component of this analysis.

Methodology

The traffic operations analysis included within this study evaluates the following:

- Freeway Mainline Operations
- Freeway Ramp Merge/Diverge Operations
- Freeway Auxiliary Lane/Weaving Analysis
- Interchange Intersection Operations
- Interchange Queuing
- Freeway Ramp Metering
- Local Roads
- Accidents

Detailed methodologies for the above traffic operations were established as part of the detailed traffic study prepared for this EIR. The detailed methodologies are hereby incorporated by reference from the technical study, which can be reviewed during normal business hours at Caltrans' District 3 Office located at 2800 Gateway Oaks, Sacramento, CA.

Analysis Scenarios

Traffic operations associated with the proposed interchange are analyzed for the following three peak hour scenarios, as established through coordination with Caltrans:

- Weekday AM Peak Hour
- Weekday PM Peak Hour
- Saturday Peak Hour

Traffic operations are also analyzed for both of the following scenarios:

- Existing Conditions
- Cumulative (Year 2025) Conditions

For the local roads analysis, impacts are analyzed for daily conditions.

Baseline Rancheria Traffic

Existing Baseline Rancheria Traffic

The provision of a new freeway interchange which will provide access to the existing Rancheria will result in a slight adjustment of traffic on roadways surrounding the project site. Vehicles currently access the Rancheria site from Greenstone Road via the private roadways of Grassy Run Road, Rolling Rock Road, and Reservation Road. Following the construction of the new interchange, these vehicles would likely shift over to the interchange.

A count of traffic along the route currently used to access the site was conducted early 1999, and showed that during the PM peak hour approximately 15 inbound vehicles and 7 outbound vehicles were traveling to and from the Rancheria (and adjacent private development). These volumes were reassigned to the new interchange and US-50 to create an adjusted baseline weekday PM peak hour scenario. AM peak hour and Saturday peak hour volumes throughout the study area were similarly adjusted to reflect rerouted trips during these peak hour periods. Newly generated trips from the proposed hotel and casino were added to these baseline Rancheria volumes.

Cumulative Baseline Rancheria Traffic

Baseline Rancheria traffic is expected to grow along with background traffic within the rest of the El Dorado County area. For this analysis, an annual growth rate of 1% per year was assumed and added to existing baseline Rancheria peak hour traffic volumes to establish cumulative baseline Rancheria volumes. The 1% annual growth rate was established through consultation with officials of the tribal council who provided information regarding historical growth, and projected growth within the Rancheria. Rather than increase each of the individual turning movements, the inbound/outbound volumes were grown by a compounded growth rate of 1% per year. These were then proportioned out among the intersection turning movements at each of the ramp intersections. Newly generated trips from the proposed hotel and casino project were added to these baseline Rancheria volumes.

Casino Traffic Volumes

This section establishes the trips which would be generated by the proposed hotel and casino development. This is necessary since the casino development will comprise nearly all of the traffic volumes for the interchange. To establish total volumes for the proposed interchange, the hotel and casino volumes established within this section are added to baseline Rancheria traffic volumes which are generated by the remainder of the Rancheria.

Casino Project Trip Generation

As **Table 5.4-6** shows, it is projected that the proposed hotel and casino would generate a total of 9,918 trips during a typical weekday of the peak month, 739 of which would occur during the AM peak hour, and 1,219 of which would occur during the PM peak hour. On a Saturday during the peak month of the project, it is projected that the Proposed Project would generate 14,600 trips, 1,691 of which would occur during the peak hour. The methodology for establishing these estimates was established as part of the detailed traffic study prepared for this EIR. The methodology is hereby incorporated by reference from the technical study,

which can be reviewed during normal business hours at Caltrans' District 3 Office located at 2800 Gateway Oaks, Sacramento, CA.

Table 5.4-6 Casino-Hotel Project Trip Generation

Time Period	Size	Rate	In/Out Split	Trip Generation In	Trip Generation Out	Trip Generation Total
Casino Trip Generation						
Weekday	238.5 ksf	39.43	----------	-------	-------	9,404
Saturday	238.5 ksf	59.07	----------	-------	-------	14,088
Weekday AM Pk Hr	238.5 ksf	2.95	70% / 30%	493	211	704
Weekday PM Pk Hr	238.5 ksf	4.95	53% / 47%	626	555	1,181
Saturday AM Pk Hr	238.5 ksf	6.90	46% /54%	757	889	1.646
Hotel Trip Generation(1)						
Weekday	250 Rooms	2.06	----------	-------	-------	514
Saturday	250 Rooms	2.05	----------	-------	-------	512
Weekday AM Pk Hr	250 Rooms	0.14	61% / 39%	21	14	35
Weekday PM Pk Hr	250 Rooms	0.15	53% / 47%	20	18	38
Saturday AM Pk Hr	250 Rooms	0.18	56% / 44%	25	20	45
Total Trip Generation						
Weekday				-------	-------	9,918
Saturday				-------	-------	14,600
Weekday AM Pk Hr				514	225	739
Weekday PM Pk Hr				646	573	1,219
Saturday AM Pk Hr				782	909	1,691

Source: David Evans and Associates, 2001.
Notes: ksf = 1,000 square feet
(1) = Trip rates based on ITE Trip Generation – Hotel (Land Use 310). Rate reduced by 75% to account for internal capture to/from casino.

Subsequent to the initial establishment of trip generation for this study, additional research was conducted to validate trip generation assumptions. Some parties have publicly stated that the proposed hotel and casino would generate over 17,000 trips per day instead of the of 9,918 weekday trips assumed within this analysis. The following research and analysis (which is provided in more detail within the technical study) helps to verify that the trip generation assumptions used within this report are reasonable and conservative, and helps illuminate how erroneous conclusions might be mistakenly drawn by others from similar research.

(1) <u>San Diego Casino Study</u> - The San Diego County Department of Public Works prepared a study of casino trip generation titled "*Report on the Potential Impacts of Tribal Gaming on Northern and Eastern San Diego County*." The traffic study portion of this report, which was included as an appendix, was titled "*Preliminary Traffic Assessment of Indian Gaming Projects in the San Diego Region*" dated October 17, 2000. Due to confusion regarding the

specific criteria used in preparing this study, David Evans and Associates contacted the licensed traffic engineer serving as the project manager for this study. The project manager stated that the November 1, 2000 report which has been referenced within comments was only a preliminary report, and that the assumptions used regarding trips rates have since been revised. Additionally, it is important to note that the preliminary San Diego report did not specifically differentiate between the square footage of the ENTIRE casino facility vs. the square footage of ONLY the gaming floor area. This distinction is crucial when comparing trip generation rates. The project manager stated that since the submittal of the preliminary report, they have established that the 130 trips/1,000 sq. ft. of casino they used previously was with respect to the square footage of ONLY the gaming floor area, and not the square footage of the ENTIRE casino. Trip generation rates associated with the ENTIRE square footage of the casino would logically be significantly smaller than rates associated with the square footage of ONLY the gaming floor area due to the inclusion of square footage associated with ancillary uses such as restaurants, banking facilities, day care, offices, rest rooms, lobby areas, retail, etc. San Diego County is in the process of revising their earlier report with a more detailed report using more refined numbers, which will specify that the trip generation rates used are relative to the square footage of ONLY the gaming floor area. The project manager stated that they will be revising their trip generation rate down to 100 trips/1,000 square feet of gaming floor area. The ENTIRE Shingle Springs casino, including all ancillary uses (but excluding the hotel) is proposed to be 238,500 sq. ft., whereas the gaming floor area is proposed to include only 82,800 sq. ft. If the 82,800 sq. ft. of ONLY the gaming floor area of Shingle Springs was used, the trip rate (assuming the total trip generation were held constant) would be 113.57 trips/ksf, which is almost 14% higher than the trip rate which is being used within the revised San Diego report. The project manager also stated that the revised San Diego study will also assume an internal capture for a mixed hotel/casino, although a slightly more conservative rate of 3.0 trips/room for an average weekday will be added to casino hotel trip generation.

(2) Mystic Lake Casino - David Evans and Associates located trip generation calculation research for Mystic Lake Casino-Hotel, a large stand-alone Indian gaming casino facility in southwestern Minnesota. This research was included within the *"St. Croix Meadows Racing Park Proposed Casino Traffic Impact Study; Hudson, Wisconsin"* (also called the Hudson Casino) prepared by BRW within the past 2 years. The Mystic Lake Casino-Hotel is also a very large complex, and very similar in nature to the proposed Shingle Springs casino, with a total size of 447, 600 sq. ft., 101,500 sq. ft. of gaming floor area, 416 room hotel, and 3,916 gaming positions. Trip rates were established based on surveys of existing weekday PM peak hour, and Saturday peak hour trips which are currently visiting the facility. Because this facility is large, it is assumed that trip rates experienced at the facility would provide a

reasonable check of peak hour trip rates used for the Shingle Springs analysis. The trip rates assumed for the Shingle Springs Casino are 25% higher for weekday PM peak hour conditions, and 57% higher than Saturday peak hour conditions than actually occur at the Mystic Lake Casino-Hotel. Thus, from this perspective, the peak hour trip rates used for the Shingle Springs facility are considered to be reasonable and conservative.

(3) ITE Article - An article published within the May, 1992 Institute of Transportation Engineers Journal titled "*Trip Generation Rates for Las Vegas Area Hotel-Casinos*" was referenced to see how trip generation rates for the proposed Shingle Springs Casino corresponded to the findings within the article. Trip characteristics for "all hotel-casinos" analyzed as part of the study, rather than "strip hotel-casinos," were used for comparisons since they included rural casinos in outlying areas, and off-strip casinos with 200-300 rooms, as well as strip casinos. Within this study, trip generation rates for entire hotel-casino complexes were established using three separate variables (1) number of hotel rooms, (2) employees, (3) thousand square feet of casino gaming floor area. When average together, it can be seen that fitted curve equations within the article result in an average number of trips which are 32-35% lower than those which were actually used for Shingle Springs. Thus, from this perspective, the peak hour trip rates used for the Shingle Springs facility are considered to be conservative.

(4) ITE Casino Trip Generation Report - A write up regarding trip generation rates for the Shingle Springs study was submitted to a member of the technical advisory committee which helped to put together a report prepared for the Institute of Transportation Engineers titled "*Casino Trip Generation*." This report is currently undergoing final review and is expected to be published in the near future. This individual reviewed the trip generation assumptions used within the Shingle Springs study and verified that the rates and methodology were fully consistent with this report, and that in his opinion, the rates used, and trips generation volumes calculated, were very conservative for a facility this size. He also verified that an assumption of approximately 2 trip/room (25% of the trip generation vs. a stand alone hotel) is reasonable.

As the research and analysis above indicates, the trip generation assumptions within this report (including 9,918 weekday trips) are reasonable and conservative. Additionally, the discussion above shows that great care must be taken when comparing assumptions used within this analysis against those drawn from other sources. As shown, it is important that data be used correctly. For example, it is important that trip generation based on rates established for the square footage of the gaming floor area be carefully distinguished from those established for the square footage of an entire casino. Similarly, it is important that

allowances be made for the mixed nature of the project, and recognized that a combined casino-hotel will draw significantly less traffic than the combined traffic associated with a similar sized stand alone casino and stand alone hotel.

Peak Hour Trip Distribution and Assignment

Peak Hour Trip Distribution

Peak hour trip distribution of hotel and casino project generated traffic is based on information in the Urban Systems Marketing Study, and the geographical location of population centers from which the casino is expected to draw both customers and employees. Based on this criteria, a significant percentage of the casino's traffic is expected to originate from the Sacramento/San Francisco Bay area.

Based on this criteria, peak hour trips to and from the proposed casino project (for analysis of impacts within the immediate vicinity of the project) were distributed as follows:

- 80% to/from the west (Sacramento/San Francisco Bay area)
- 20% to/from the east (Placerville/South Lake Tahoe area)

Casino project trips as assigned to the two proposed freeway interchange intersections for weekday AM and PM peak hours, and the Saturday peak hour, are depicted in **Figure 5.4-1**.

Peak Hour Passer-By Diversion

Not all of the traffic to and from the proposed casino project would be newly generated trips. A significant percentage of the through traffic on Highway 50 consists of vehicles traveling to and from Lake Tahoe, and a large percentage of these trips have a known propensity to gamble. Also, Shingle Springs will be an attractive stop for vehicles traveling a significant distance to and from locations such as the Bay Area, Stockton, etc. Thus, many of the people visiting the casino will be people who would have already been on the freeway en route to other existing casinos or recreational activities, particularly east of the project site including in large part the Tahoe area. Therefore, the trip generation calculated for the proposed casino must be adjusted before assigning the trips to the freeway. In other words, although 100% of the trips generated by the hotel and casino would be assigned as new trips to the ramps, intersections, and roadways of the new interchange, only a percentage of these trips should be assigned to US-50 as new trips since a significant percentage are assumed to already exist on the freeway. Without the new interchange and casino, these trips would have continued past the new interchange along US-50. With the new interchange and casino, it is assumed some of these trips will be intercepted or diverted to the new casino.

See Figure 5.4-1

For this traffic analysis, it was conservatively assumed that 40% of peak hour trips generated by the proposed casino project would be trips which are already assumed to exist within existing (and future projected baseline) US-50 traffic volumes during peak hours. Following the completion of the casino and interchange, this 40% is assumed to stop at the site rather than continuing past the site, which they would do in the absence of the development. This assumed passer-by capture rate was established by Caltrans in consultation with the traffic consultant. The detailed methodology establishing the passer-by capture rate was established in the detailed traffic study prepared for this EIR and is hereby incorporated by reference. The technical study can reviewed during normal business hours at Caltrans' District 3 Office located at 2800 Gateway Oaks, Sacramento, CA.

Daily Trip Distribution and Assignment

To establish daily trip distribution to local roads, it was necessary to disaggregate the total number of project trips into various trip types to differentiate between newly generated trips and those which are assumed to already be on US-50 as passer-by trips. To do this, the total daily project traffic volumes for an average weekday during the peak month were used:

9,404 casino trips + 514 hotel trips = **9,918 TOTAL trips**

Trips generated by the hotel and casino were broken down into categories and assigned to highways and local roadways within El Dorado County as shown in **Table 5.4-7**

Employee Trips to both the casino and hotel were established assuming a total of 1,500 casino employees (including full time administrative staff) and an additional 200 hotel employees. It was assumed that on an average weekday that 550 casino employees, 200 administrative employees, and 90 hotel employees would travel to and from the site. It was assumed that each employee vehicle would include 1.2 people, and that each vehicle would make a total of 2.2 trips per day. Employee trips were distributed using the County's travel forecast model, which distributed traffic volumes to US-50 interchanges as shown in **Table 5.4-8**.

Local & Regional Gamer Trips are defined as trips where a gamer's trip originated generally from their residence. These trips were established through use of market forecasts as described within the Marketing Study performed by Urban Systems. This study carefully analyzed the potential gaming market and the likely locations where gamers would be drawn from. Factors such as distance from the proposed casino, the propensity for gaming by residents in certain locations, and the influence of competing casinos such as Jackson

Table 5.4-7 Shingle Springs Average Daily Trip Generation

Trip Type		Avg. Week Day Trips
Employees (Assume Hotel = 10%)		1,375
Gamers - Local Residents (El Dorado Co. & vicinity)		965
Gamers - Regional Residents (SF, Sacramento, etc.)		
	(West along US-50)	4,565
	(North along SR-49)	199
	(South along SR-49)	135
Gamers - Tourists		
	Visiting Friends & Family	48
	Business	169
	Conventioneers	14
	Vacationers	37
Recreation by Hotel Guests		304
Other Hotel (Non Employee/Recreation)		72
Buses		20
Deliveries		20
Traffic Diversion of "Passing Through" Traffic		1,995
Total		**9,918**

Source: David Evans and Associates, 2001.

Rancheria and the proposed Auburn Rancheria were considered. The exact locations of gamers was delineated as much as was necessary to determine the exact roadways in which

gamers would arrive at the project site. For example, all of the gamers from the San Francisco, Sacramento, and Stockton areas would arrive via US-50, whereas gamers in the Rocklin, Auburn area have a choice between SR-49 and US-50 (via Auburn-Folsom Rd,Sunrise Blvd, Hazel Ave, etc.). Local gamer trips were separated from regional gamer trips and distributed onto the local roadway network using the County's travel forecast model, in the same manner in which employees were distributed. It is assumed that gamers and employees living in the immediate vicinity of the project will be distributed in a similar manner since each is a function of the location of local residential development.

Tourist Gamer Trips are defined as gamers who are visiting the northern California area. These can be separated into people visiting family and friends in Northern California, people visiting the area on business or attending conventions, and people who are vacationing in the area. For purposes of this study, it is assumed that most of the business people and conventioneers will be arriving at the site from locations west of El Dorado County (i.e. Sacramento). It is also assumed that 80% of the tourist gamers visiting family and friends would also be arriving from the west, with the remaining 20% assumed to be visiting family and friends within El Dorado County (and thus also distributed to local roadways using the

Table 5.4-8 Local Trip Distribution (Employees & Local Gamers)

US-50 Interchange/Intersection	Cumulative %		% to/from South	Total % to/from Interchange	% to/from North
	9.1%	*(Continuing West)*			
1. El Dorado Hills Blvd / Latrobe Rd		<---	2.0%	9.8%	7.8%
	18.9%				
2. Bass Lake Rd		<---	0.6%	1.4%	0.8%
	20.3%				
3. Cambridge Rd		<---	0.1%	3.0%	2.9%
	23.3%				
4. Cameron Pk Dr		<---	2.0%	12.0%	10.0%
	35.3%				
5. Ponderosa Rd / S. Shingle Rd		<---	5.5%	14.3%	8.8%
	49.6%				
6. E. Shingle Springs Dr		<---	3.5%	7.0%	
	53.1%	*(to/from west)*			
New Shingle Springs Rancheria Interchange					
	46.9%	*(to/from east)*			
7. Greenstone Rd		<---	7.9%	12.8%	4.9%
	34.1%				
8. El Dorado Rd		<---	0.6%	0.9%	0.3%
	33.2%				
9. Missouri Flat Rd		<---	9.3%	13.2%	3.9%
	20.0%				
10. Placerville Dr / Forni Rd		<---	1.3%	6.0%	4.7%
	14.0%				
11. Main St		<---	0.2%	1.0%	0.8%
	13.0%				
12. SR 49		<---	2.1%	3.4%	1.3%
	9.6%				
13. Bedford Ave		<---	0.8%	2.2%	1.4%
	7.4%				
14. Mosquito Rd		<---	0.9%	2.0%	1.1%
	5.4%				
15. Schnell School Rd		<---	0.8%	1.3%	0.5%
	4.1%				
16. Point View Dr		<---	0.6%	0.8%	0.2%
	3.3%				
17. Carson Rd		<---	0.4%	0.7%	0.3%
	2.6%				
18. Carson Rd (@ Barkely)				0.7%	0.7%
	1.9%				
19. Carson Rd (@ Pony Express Tr)				0.4%	0.4%
	1.5%				
20. Pony Express Tr				0.5%	0.5%
	1.0%				
21. Sly Park Rd		<---	0.3%	0.6%	0.3%
	0.4%	*(Continuing East)*			

Source: 1999 El Dorado County travel forecast model.

County's travel forecast model). Finally, people who are vacationing in the area were assumed to arrive from local points of recreation (described below). Most of the trips associated with Tourist Gamers were assumed to be arriving at the site from locations west of

El Dorado County, although a portion of the trips were assigned to local roadways within El Dorado County.

Recreation Trips by Hotel Guests are based on the assumption that some of those people who are staying at the hotel (whether they are gamers or not) will visit one or more of the many recreational spots in the area. Assuming that each hotel guest party (i.e. 1 occupied room) stays an average of 1.75 days, and assuming that each party makes 1.25 recreation oriented trips per stay, an average of 304 trips per day (inbound plus outbound) would be generated by the project. Extensive research was performed regarding the various recreational choices in the area, and the number of visitors to each. Using this information, as well as input from the El Dorado County Chamber of Commerce, recreational trips by guests were distributed to roadways to and from the destinations shown in **Table 5.4-9**.

Other Hotel Trips are trips associated with that portion of trips related specifically to the hotel, which are over and above project trips calculated specifically in connection with the casino. Other hotel trips are the remainder of hotel trips after deductions for hotel employee trips (assumed as 10% of the projected 1,500 employees), and recreation trips as described above. As discussed elsewhere, 75% of trips associated with the hotel are assumed to be trips which would have been generated by the casino with or without the hotel. Most of these trips were assumed to be arriving at the site from locations west of El Dorado County.

Bus Trips are assumed to number, on average, 20 per day based on information included within the Marketing Study performed by Urban Systems. It is assumed that these trips would be arriving at the site from locations west of El Dorado County.

Delivery Trips are assumed to number, on average, 20 per day based on information provided by the shipping and receiving department of a similar northern California casino. It is assumed that these trips would be arriving at the site from Placerville.

Traffic Intercept Trips are the most difficult component of the traffic to establish. Although the previous traffic study assumed a passer-by capture rate of 40% along US-50, a more refined calculation was established which took into account the assumed passer-by capture for each individual trip type generated by the project. The following details this breakdown.

Urban Systems Marketing Study concluded that 8% of “through” vehicular traffic passing along US-50 would be captured (excluding both commuter traffic and truck traffic). Based on research conducted by Urban Systems, it is assumed that 65% of traffic along US-50 in the vicinity of the project is commuter oriented. Additionally, Caltrans truck volume data

Table 5.4-9 Hotel Recreation Trip Distribution

Recreation Choice	Percentage
Downtown Placerville (Antiques, Museums, Restaurants, Shopping, etc.)	25%
Apple Hill (+ North County Wineries)	13%
Coloma area North County Wineries	1%
South County Wineries	8%
Marshall Gold State Park	12%
Gold Bug Park	3%
White Water Rafting (Coloma Put In)	3%
White Water Rafting (Chili Bar Put In)	2%
Golf (El Dorado Hills Golf Course)	2%
Golf (Apple Mtn Golf Course)	3%
Other Misc. Attractions (in western & central El Dorado Co.)	5%
South Lake Tahoe & other attractions in East County (east along US-50)	8%
Sacramento & Folsom (west along US-50)	10%
Auburn (and other pts north along SR-49)	3%
Yosemite (& other pts south along SR-49)	2%
TOTAL	100%

Source: David Evans and Associates, 2001.

shows that 6% of the volumes along US-50 in the vicinity of the project are trucks. Based on 2000 Caltrans counts, the average annual daily traffic volumes along US-50 between Shingle Springs and Greenstone Road is 43,000 vehicles. Thus, as the following calculation shows (**Table 5.4-10**), there are 12,470 through vehicular (non-truck) trips on an average weekday.

Table 5.4-10 Average Daily Trip Generation

2000 AADT on US-50 between Shingle Springs & Greenstone	**43,000**
Commuter Traffic = 65%	27,950
Through Traffic = 35%	15,050
Truck Traffic = 6%	2,580
Through Vehicular (Non-Truck) Traffic	**12,470**
Traffic which Casino will Intercept = 8%	1,000
Trips due to traffic intercept (2 trip ends/vehicle)	**2,000**
Total Shingle Springs Trip Generation (Average Weekday)	9,918
% of Average Daily Trip Generation	**20.2%**

Source: David Evans and Associates, 2001.

If it is assumed that the project captures 8% of this traffic, then 20.2% of the trips generated by the project on an average weekday are due to the "capture" of passing through traffic.

These trips do not fall into any other category, and thus are assumed to be simply "passer-by capture of through vehicular volumes" trips.

It is important to note, however, that other trips generated by the project will also exist on US-50, and thus should not be added to trip generation volumes on US-50. **Table 5.4-4** breaks down the various types of trips which are assumed would already exist along US-50, and which would be either diverted or intercepted by Shingle Springs. These trip type percentages are based in large part on information provided by Urban Systems both within the Marketing Study and verbally. However, additional assumptions are based on assumptions considered to be reasonable for the project.

As the **Table 5.4-11**, it is assumed that almost 39% of the trips which the project would generate on an average weekday would already be present on US-50. This is slightly less than the 40% passer-by capture assumed for peak hour conditions. It is expected that the passer-by capture during peak hours is higher than daily conditions due to increased traffic volumes and congestion during the peak hours, at which time the casino would provide an even higher degree of attraction as a means of waiting out congestion.

It is important to note that the total number of project trips was established through careful research of trip generation characteristics at other casino facilities, some of which includes hotels. Trip generation rates were established by conducting counts of traffic entering and exiting driveways at other casinos, which would thus include every type of trip possible including each of the various types of project trips described above such as the employee trips, recreation oriented trips, buses, deliveries, capture of passerby volumes, and obviously gamer trips. It is important to note that in realty the exact number of trips which would correspond to any specific trip type can never be known with certainty, and in fact many trips would be spread out over the various trip types. It would be nearly impossible for a study of this magnitude, with the complexity and variety of trips generated, to be broken down perfectly into each exact trip type. However, the assumptions, trip allocations between trip types, and distribution and assignments to highways and local roadways represents the analyst's best faith effort to reasonably identify all trip types, and simulate traffic conditions with the project. The analysis reasonably represents the manner in which trips would be generated and distributed "as a whole." The breakdown into trip types simply represents the best analytical approach to reasonably distribute trips.

Table 5.4-11 Passer-By Capture % by Trip Type

Passer-by-Capture	Percent
Passer-By Capture (Through Vehicular) includes gamers with South Lake Tahoe as primary destination	20.1%
"Intercepted Trips" associated with Bay Area, Sacramento, and Stockton gamers who would have been traveling to South Lake Tahoe casinos, but instead will visit Shingle Springs. (12% of trips as defined)	5.5%
"Diverted Trips" associated with Bay Area, Sacramento, and Stockton gamers who would have gone to South Lake Tahoe casinos in the absence of Shingle Springs, is visiting Shingle Springs as a primary destination instead, but will still continue to Tahoe as a secondary destination (4% of trips as defined)	1.8%
"Intercepted Trips" associated with El Dorado County area gamers who would have gone to South Lake Tahoe casinos in the absence of Shingle Springs, but instead will visit Shingle Springs. (63% of trips as defined) (Note: Capture rate varies along US-50 within El Dorado County)	6.1%
"Diverted Trips" associated with Employees who are assumed would have been on US-50 to/from other jobs in the area (25% of trips as defined)	3.5%
"Diverted & Intercepted Trips" associated with Gamers who are Tourists visiting family and friends (20%), in area on Business (10%), in area attending Conventions (10%), in area Vacationing (25%)	0.4%
Misc. "Diverted & Intercepted Trips" associated with Hotel Guests participating in area Recreation (25%), other misc. Hotel related trips (50%), Buses (50%), and Deliveries (100%)	1.4%
Total Passer-By Capture	**38.8%**

Source: David Evans and Associates, 2001.

Significance Criteria

Caltrans Route Concept Report

The target level of service for this analysis is based primarily on *Caltrans' State Route 50 Transportation Concept Report*, issued in April. The report includes the following text which describes Caltrans' goals and objectives for US-50 within El Dorado County, specifically within the vicinity of the proposed interchange.

> *Segment 6 consists of a four-lane divided freeway from the Sacramento/El Dorado County Line to the West Placerville Undercrossing. The terrain is predominantly rolling (some steep grades).*
>
> *This segment carries the greater share of commuter travel emanating from El Dorado County. Although this segment stretches to just west of Placerville, the primary focus for this segment is on the commuter travel shed which lies between the Sacramento/El Dorado County Line to Ponderosa, near Shingle Springs. The increases in commute travel volumes arise from the growing communities of El Dorado Hills, Bass Lake, Cameron Park, and Shingle Springs which act as bedroom communities to employment centers in Sacramento County, i.e., Folsom, Rancho Cordova. The remainder of the segment carries relatively lower commute traffic volumes, and travel patterns turn mostly interregional and recreational in nature. This segment overall*

operates at an acceptable LOS E. However, the western portion of this segment often, during peak periods, falls to LOS F. The level of service for the entire segment is expected to drop to "F" by the year 2007. By the year 2017, it is estimated that demand will exceed the capacity of the facility by 1.63 times with two or more hours of delay.

** Implementation of the Concept Improvements, i.e., six-lane freeway with HOV, in conjunction with additional local parallel facilities, light-rail extensions, etc., will not provide this segment with LOS E the entire twenty-year period. It will be necessary, therefore, to examine the need to further expand this segment of SR 50 prior to the conclusion of the planning period rather than beyond the twenty-year period.*

SACOG U.S. 50 CORRIDOR STUDY: On December 18, 1997, the SACOG Board adopted the strategies in the Investment Strategy for the U.S. Corridor Major Investment Study. The study evaluated long-term investment strategies including light-rail extensions, alternative phasing strategies for carpool lanes, and transportation management strategies within the SR 50 Corridor from downtown Sacramento to El Dorado Hills in El Dorado County.

Relative to Segment 6, the findings of the study identified the following Tier 1 strategy project (projects for early funding consideration from regional or discretionary sources – in priority order): Priority No. 8 – HOV lanes on U.S. 50 between Prairie City Road and El Dorado Hills Boulevard ($9.4 million). Under Tier 2 (projects to be considered for Regional or Discretionary Funds), the study also recommended transportation management strategies and operational policies to be implemented or studied.

The *Route 50 Transportation Concept Report* states that the concept level of service for US-50 between Sacramento and Placerville is LOS E. Thus for this analysis, LOS below this level (LOS "F") would be considered an unacceptable condition.

Standards of Significance - Freeway Mainline and Freeway Ramps

At the direction of Caltrans staff, the concept level of service for freeway mainline and freeway ramp merge analysis is LOS E, thus LOS "F" is considered unacceptable for freeway mainline and merge analyses.

The target level of service for freeway ramp diverge analysis is a reduced LOS D, thus LOS "E" or "F" is considered unacceptable for diverge analyses.

Standards of Significance - Study Intersections

In terms of the new intersections which may be a part of the proposed interchange, the applicable target level of service criteria for the new intersections would likely need to conform to Caltrans level of service standards. Using Caltrans concept level of service

criteria as described above, LOS D would logically be used as the target level of service for new intersections.

However, intersection levels of service should also be checked against the target level of service criteria established for El Dorado County. The 1996 El Dorado County General Plan states the following in Policy 3.5.1.1:

> *The County shall adopt a roadway plan consistent with planned land use and shall maintain an operating Level of Service of 'E' or better on all roadways, consistent with Objective 3.5.1. In addition, all road segments projected in the roadway plan at the year 2015 to be operating at LOS A, B, or C shall not be allowed to fall below LOS C and all road segments at LOS D shall not fall below LOS D.*

Therefore, LOS "C" is regarded as the target LOS for the newly created intersections. LOS below this level (LOS "D", "E" or "F") is considered an unacceptable condition.

Standards of Significance - Local Roads

Potential impacts to local roads (including SR-49 SR-198) were analyzed using the following methodology, as established in coordination with El Dorado County traffic engineering personnel.

- Impacts to all "major roads" within El Dorado County were analyzed, as identified and included within both the *"El Dorado County General Plan Circulation Map"*, and the 1999 version of the "*El Dorado County Travel Demand Forecasting Model"* in MINUTP.
- Impacts were analyzed for existing and cumulative daily conditions.
- Roadway capacities, and resulting levels of service, were established through use of spreadsheets associated with the El Dorado County model.
- Roadway geometries, and corresponding capacities, for cumulative conditions are based on the roadway network geometries included within the 2022 CIP (Capitol Improvement Program) data network files contained with the 1999 El Dorado County travel demand model.
- A roadway was assumed to be impacted, but not necessarily "significantly impacted" by the project, if it added more than 2% to the existing roadway volume.
- A roadway was assumed to be significantly impacted by the project if it <u>also</u> met any of the following criteria:
  a) Degrading from acceptable LOS (A,B or C) without the project to an unacceptable LOS (D,E or F) with the project
  b) Degrading from unacceptable LOS D without project to unacceptable LOS E with the project, when the cumulative LOS is D or better (as defined within the 2015 CIP)
  c) Degrading from unacceptable LOS D without project to unacceptable LOS F with project

d) Degrading from unacceptable LOS E without project to unacceptable LOS F with the project
e) Unacceptable LOS F both without and with the project

Impacts along US-50 from the Sacramento/El Dorado County line to east of the project site are based on the concept level of service E, established within *Caltrans' State Route 50 Transportation Concept Repo*rt and additional information provided by Caltrans. Thus LOS F is considered an unacceptable level of service for US-50.

Impacts/Mitigation

Impact 5.4-1 Existing Plus Project- Ramp Merge/Diverge Operations

AA There would be ***no impact*** associated with the No Project Alternative.

AB Freeway ramp merge/diverge analysis were analyzed two different ways to provide for a comparative analysis. The first method of analysis calculates ramp merge/diverge operations for rolling terrain, and does not take into account the specific grades and grade lengths; whereas the second method uses actual specific grades and grade lengths of the freeway leading up to the ramp, and along the ramp itself.

For detailed analysis which takes into account the specific grade and grade lengths of the freeway and ramp in establishing ramp merge/diverge operations, the grade length is calculated by taking the straight portion of the grade leading to (and perhaps continuing past) the ramp juncture point, and adding to this value ¼ of the vertical curves at both the beginning and end of the grade.

Although level of service analysis as included within HCS (Highway Capacity Software) also provides for the input of specific ramp grade and length, this data is negligible in terms of the analysis unless the volume along the ramp approaches the capacity of the ramp. Within the analyses included within this report, it was found that the specific grade and length of the ramps itself were negligible in terms of the level of service of the ramp merge/diverge.

Freeway ramp merge/diverge analysis also provides for the consideration of interference to traffic flow and capacity based on the location of adjacent freeway ramps, and the traffic volumes to and from them. For 4-lane freeway merge/diverge analysis, the length to the adjacent ramp and the volume on the adjacent ramp does not impact the result in anyway since the equation used to calculate level of service does not include this variable. Thus, although a

distance to the adjacent ramp may be provided within 4-lane merge/diverge analysis, the value is irrelevant in terms of the level of service calculation.

A free flow speed of 48 kph (30 mph) was used for both project alternatives. This default value was used to approximate the design speed of 80 kph (50 mph) at inlet and exit noses of the ramps associated with Alternative AB, and 45 kph (28 mph) along the remainder of ramp.

Ramp merge/diverge analyses are performed only along the peak direction of travel for weekday peak hour conditions, which is along the westbound direction during the AM peak hour, and the eastbound direction during the PM peak hour. Ramp merge/diverge analyses are performed along both directions of travel for the Saturday peak hour. Analyses were not performed along the non-peak direction of travel following consultation and approval of Caltrans personnel.

Table 5.4-12 provides a summary of freeway merge/diverge operations for all three peak hour scenarios following the completion of the proposed interchange and proposed hotel and casino. The ramp merge/diverge level of service is applicable to all three scenarios, and uses "rolling terrain" to establish levels of service. The levels of service depicted are based on minimum acceleration/deceleration lengths of 250 ft. (76 meters).

As the table below shows, all of the ramps are projected to operate acceptably at LOS D or better during all three peak hour scenarios for existing conditions with the new interchange and casino/hotel.

Table 5.4-12 Existing plus Project Freeway Ramp Level of Service (Rolling Terrain)(1)

Ramp	Level of Service		
	AM Peak Hour	PM Peak Hour	Saturday Peak Hour
Eastbound off-ramp	------	D	D
Eastbound on-ramp	------	D	C
Westbound off-ramp	C	------	C
Westbound on-ramp	C	------	C

Source: David Evans and Associates, 2001.
Notes: Length of deceleration and acceleration lanes assumed to be 250 ft. (76 meters)
(1) Level of service calculated using generalized "rolling" terrain instead of exact specific grade/length.

Table 5.4-13 provides a similar summary of freeway merge/diverge operations, but is based on the use of the specific grade and grade length along

the freeway. As previously described, it has been determined that the levels of service reported are the same for both alternatives. Again, the levels of service depicted are based on minimum acceleration/deceleration lengths of 250 ft. (76 meters).

Table 5.4-13 Existing plus Project Freeway Ramp Level of Service (Specific Grade/Length)(1)

Ramp	Specific Grade	Specific Length (ft)	Level of Service		
			AM Peak Hour	PM Peak Hour	Saturday Peak Hour
Eastbound off-ramp	+4.38	2,525	------	D	D
Eastbound on-ramp	+2.28	1,150	------	C	C
Westbound off-ramp	-2.28	1,150	C	------	C
Westbound on-ramp	-4.38	2,525	C	------	C

Source: David Evans and Associates, 2001.
Notes: Length of deceleration and acceleration lanes assumed to be 250 ft. (76 meters)
(1) Level of service calculated using exact specific grade/length instead of generalized "rolling" terrain.

As both of the above table shows, the freeway ramp merge/diverge areas for the new interchange are projected to operate acceptably at LOS D or better during all three peak hour scenarios for existing conditions with the new interchange and casino/hotel, regardless of whether they are analyzed using rolling terrain or specific grade/length. Therefore, this is considered a ***less-than-significant impact***.

AC Impacts associated with Alternative AC are identical to those identified above for Alternative AB. Therefore, a ***less-than-significant impact*** will result.

Because of the methodology used to calculate the specific grade and grade length along the freeway, minor differences in the location of the ramp juncture points for each alternative do not change the length of the grade. Therefore, the specific grade and length of the ramps itself were negligible in terms of the level of service of the ramp merge/diverge, and the same specific grade and grade length along the freeway are applicable to analyses for both alternatives. To verify, a detailed analysis was performed for Alternative AB, and a trial and error input of the other possible input values for the Alternative AC was performed. This trial and error input included the ramp lengths, grades and volumes for Alternative AC, as well as extreme ramp lengths, grades and volumes outside the range of possibilities for Alternative AC. This trial and error analysis confirmed that the merge/diverge levels of service for

the all alternatives and peak hour scenarios correspond to those calculated for Alternative AB. Therefore, for analyses which provide for the input of specific grades and grade lengths, the same values are used for both alternatives since the input for each result in exactly the same level of service results.

Mitigation 5.4-1 Existing Plus Project- Ramp Merge/Diverge Operations

None Required.

Impact 5.4-2 Existing Plus Project- Peak Hour Freeway Mainline Operations

AA There would be ***no impact*** associated with the No Project Alternative.

AB **Table 5.4-14** shows the freeway mainline operations for all three peak hour scenarios following the completion of the proposed interchange and proposed hotel/casino. As the table shows, the freeway is projected to operate acceptably at LOS D or better during all three peak hour scenarios for existing conditions with the new interchange and casino/hotel. Therefore, this is considered a ***less-than-significant-impact***.

Table 5.4-14 Existing Plus Project Freeway Mainline Level of Service

	Freeway Level of Service(1)					
	Existing (no project)			Existing plus Project		
Freeway Segment	AM Pk Hr	PM Pk Hr	Sat Pk Hr	AM Pk Hr	PM Pk Hr	Sat Pk Hr
Eastbound US-50 (between E. Shingle Springs & Rancheria)	B	D	C	C	D	D
Eastbound US-50 (between Rancheria & Greenstone)	B	D	C	B	D	D
Westbound US-50 (between Greenstone & Rancheria)	D	C	C	D	C	C
Westbound US-50 (between Rancheria & E. Shingle Springs)	D	C	C	D	C	D

Source: David Evans and Associates, 2001.
Notes: (1) Free Flow speed varies - "Ideal" Free Flow Speed of 65 mph adjusted to account for specific hwy geometry.

AC Impacts associated with Alternative AC are identical to those identified above for Alternative AB. As the above table shows, the freeway is projected to operate acceptably at LOS D or better during all three peak hour scenarios for

existing conditions with the new interchange and casino/hotel. Therefore, this is considered a ***less-than-significant impact***.

Mitigation 5.4-2 Existing Plus Project- Peak Hour Freeway Mainline Operations

None Required.

Impact 5.4-3 Existing Plus Project- Interchange Intersection Operations

AA There would be ***no impact*** associated with the no project alternative

AB Since there are no intersections associated with the Flyover Alternative, there would be ***no impact*** associated with the Flyover Alternative.

AC Interchange operations are analyzed only for Alternative AC, since the modified trumpet design of Alternative AB contains no intersections to analyze. If constructed as a diamond interchange as proposed for Alternative AC, the interchange would include two intersections.

Unsignalized Intersection Analysis

Table 5.4-15 provides a summary of intersection operations following the completion of the interchange and hotel and casino for unsignalized intersections.

Table 5.4-15 Existing plus Project Unsignalized Level of Service

Intersection	AM Peak Hour		PM Peak Hour		Saturday Peak Hour	
	LOS	Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)
New Shingle Springs Rancheria Road / Westbound ramps	A	(1.3)	A	(1.0)	A	(1.2)
New Shingle Springs Rancheria Road / Eastbound ramps	B	(5.3)	C	(11.8)	**F**	**(53.4)**

Source: David Evans and Associates, 2001.
Notes: Applicable only for Alternative AC since Alternative AB includes no intersections. Delay for unsignalized intersections based on overall average vehicle delay.

As the table above shows, the eastbound ramp intersection would not operate at an acceptable level of service as an unsignalized intersection. Therefore, this is considered a ***significant mitigable impact***.

Signalized Intersection Analysis

Both of the intersections would meet Caltrans signal warrants for rural conditions, although the westbound ramps are warranted only for weekday PM peak hour and Saturday peak hour conditions, and the eastbound ramps are warranted only for Saturday peak hour conditions. It is thus recommended that at a minimum the eastbound ramp intersection be signalized as part of the interchange construction. Although not necessary to provide acceptable level of service operation, it is also recommended that the westbound ramp intersection also be signalized to provide efficient operation.

Table 5.4-16 below shows the level of service for the two intersections following signalization.

The signalized analysis was conducted using SYNCHRO software, which considered the effects of each of the two intersections upon each other.

Interchange Queuing Analysis

Using the SYNCHRO analysis described previously, the queuing along each of the intersection approaches were analyzed. **Table 5.4-17** summarizes the queuing which would occur for Alternative AC along each of the intersection

Table 5.4-16 Existing plus Project Signalized Level of Service

Intersection	AM Peak Hour		PM Peak Hour		Saturday Peak Hour	
	LOS	Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)
New Shingle Springs Rancheria Road / WB ramps	A	(3.4)	A	(3.6)	B	(6.8)
New Shingle Springs Rancheria Road / EB ramps	B	(8.1)	B	(6.7)	B	(8.4)

Source: David Evans and Associates, 2001.
Notes: Applicable only for Alternative AC since Alternative AB includes no intersections.

approaches for existing conditions following the completion of the interchange project for signalized intersections.

As the below table shows, the queuing capacity for each of the approaches is expected to easily accommodate the projected queues for each of the peak hour scenarios for Alternative AC, with the exception of the southbound approach to the eastbound ramp intersection during Saturday peak hour conditions. Although the queue capacity is adequate for more than 50% of the Saturday peak hours (as shown by the 50th percentile queue), it would exceed the link capacity between the westbound and eastbound ramps during at least 5% of the Saturday peak hours (as shown by the 95th percentile queue). Even then, the excess queue would amount only to a single vehicle. This excess queue would in effect stretch through the westbound ramp intersection to the section of the new roadway north of the interchange. If signalized and coordinated with the signal for the eastbound ramps, the signal timing coordination could ensure that the eastbound ramp intersection would provide additional or offset green time to clear the westbound intersection. Additionally, even in a worse case scenario where traffic did extend through the westbound ramp intersection, these vehicles would not block any of the predominate movements through the intersection, since the other movements are associated primarily with southbound rights and westbound off-ramp right

Table 5.4-17 Existing Plus Project Intersection Queuing for Signalized Intersections

Movement	Available Queue Capacity (ft)	AM Peak Hour Queue (ft)		PM Peak Hour Queue (ft)		Saturday Peak Hour Queue (ft)	
		50th Percentile	95th Percentile	50th Percentile	95th Percentile	50th Percentile	95th Percentile
New Project Access / Westbound US-50 Ramps							
Northbound	163	0	0	0	0	0	0
Southbound Thru	760+	8	26	25	65	45	91
Southbound Right	760+	20	59	52	133	131	336
Westbound	1,275	55	92	54	93	69	129
New Project Access / Eastbound US-50 Ramps							
Southbound	163	16	42	49	117	87	**174 [11]**
Eastbound	983	89	135	125	171	134	215

Source: David Evans and Associates, 2001.
Notes: Queue length exceeds queue capacity [excess queue in parenthesis]

turns to the Rancheria. The only movements which would potentially be blocked would be associated with vehicles which intended to use the interchange to reverse their direction of travel along US-50. If the interchange were congested to such a degree that this extreme queuing developed, it is doubtful anyone would negotiate this movement at this particular interchange at that time.

Mitigation 5.4-3 Existing Plus Project- Interchange Intersection Operations

The impact identified above will be reduced to a ***less than significant*** level with the implementation of the following mitigation:

(A) It is recommended that the two newly created intersections under AC be signalized, and that the signals be coordinated to assure that queues would not develop which would block the westbound ramp intersection.

Impact 5.4-4 Existing Plus Project- Local Roads Analysis

AA There would be ***no impact*** associated with the no project alternative.

AB This analysis has been developed in response to comments received during the NOP comment period that related to local roads impact. To assess the impacts on local roads in the County, several assumptions about the habits of visitors to the hotel and casino site needed to be made. The assumptions made for this analysis (see *Daily Trip Distribution and Assignment* section above) are based on the professional judgement of the project's traffic engineer, since visitor habits was not available through El Dorado County or the County Visitors Bureau. It should be noted that this type of analysis, requested by El Dorado County, has never been undertaken previously and represents the most complete local roads analysis that has been undertaken for an interchange project in El Dorado County.

Table 5.4-18 provides a summary of all of the local roadway and highway segments within El Dorado County along which the project is projected to increase existing traffic volumes by 2% or more. The table also shows the resulting level of service along the roadway.

Table 5.4-19 provides a summary of the portion of US-50 within El Dorado County along which the project is projected to increase existing traffic

Table 5.4-18 Existing Local Roadway Impact Summary (Existing + Project Volumes 2% over Existing)

Road/Segment	Geometry/Classification	Existing		Project		Existing + Project	
		Daily Vol	LOS	Daily Vol	% Inc	Daily Vol	LOS
Barkley Rd.							
North of Carson Rd	2-Lane Rural Local Rd	1,009	B	21	2.1%	1,030	B
Big Cut Rd.							
Benham St to Quarry Rd	2-Lane Rural Local Rd	1,068	B	28	2.6%	1,096	B
Buckeye Rd.							
E. Shingle Springs to Mother Lode Rd (W)	2-Lane Rural Local Rd	201	A	59	29.4%	260	A
E. Shingle Springs Rd.							
US-50 to Buckeye Rd	2-Lane Rural Local Rd	1,886	C	83	4.4%	1,969	C
Forni Rd.							
Ray Lawyer Ext to Placerville Dr	2-Lane Local Rural Rd	902	B	18	2.0%	920	B
Greenstone Rd.							
Mother Lode to US 50	2-Lane Rural Minor Collector	1,085	B	322	29.7%	1,407	B
US 50 to Green Vly Rd	2-Lane Rural Minor Collector	2,659	D	268	10.1%	2,927	D
Green Valley Rd.							
Lotus Rd to Greenstone	2-Lane Urban Minor Arterial	3,981	D	238	6.0%	4,219	D
Larsen Rd.							
Barkley Rd to North Canyon Rd	2-Lane Rural Local Rd	460	B	21	4.6%	481	B
Lotus Rd.							
Green Vly Rd to GoldHill Rd	2-Lane Rural Minor Arterial	7,760	D	224	2.9%	7,984	D
GoldHill Rd to Thompson Hill	2-Lane Rural Minor Arterial	4,860	D	207	4.3%	5,067	D
Thompson Hill to Bassi Rd	2-Lane Rural Minor Arterial	4,985	E	207	4.2%	5,192	E
Bassi Rd to SR 49	2-Lane Rural Minor Arterial	4,985	E	207	4.2%	5,192	E
Mother Lode Dr.							
Greenstone to Pleasant Vly Rd	2-Lane Rural Major Collector	10,001	E	279	2.8%	10,280	E
North Shingle Rd.							
US 50 to Ponderosa	2-Lane Urban Minor Arterial	7,440	E	208	2.8%	7,648	E
Old Frenchtown Rd.							
French Crk to Mother Lode Dr	2-Lane Rural Minor Collector	1,301	B	28	2.2%	1,329	B
Oxford Rd.							
Cambrdige Rd to Cameron Park Dr.	2-Lane Urban Collector	3,609	D	85	2.4%	3,694	D
Pleasant Valley Rd.							
Mother Lode Dr to El Dorado Rd	2-Lane Rural Minor Arterial	8,045	D	250	3.1%	8,295	D
El Dorado Rd to SR 49	2-Lane Rural Minor Arterial	9,680	E	243	2.5%	9,923	E
SR 49							
County Line to Sandridge	2-Lane Rural Highway	5,600	C	146	2.6%	5,746	C
Sandridge to Pleasant Valley Rd.	2-Lane Rural Highway	7,900	E	189	2.4%	8,089	E
US 50 to SR 193 (N)	2-Lane Rural Highway	5,000	E	152	3.0%	5,152	E
SR 193 (N) to Gold Hill	2-Lane Rural Highway	3,900	D	108	2.8%	4,008	D
Gold Hill Rd to Cold Springs	2-Lane Rural Highway	1,800	C	101	5.6%	1,901	C

Road/Segment	Geometry/Classification	Existing		Project		Existing + Project	
		Daily Vol	LOS	Daily Vol	% Inc	Daily Vol	LOS
Cold Springs to Lotus Rd	2-Lane Rural Highway	1,800	C	112	6.2%	1,912	C
Lotus Rd to Marshall Rd.	2-Lane Rural Highway	4,300	C	235	5.5%	4,535	C
Marshall to Salmon Falls Rd	2-Lane Rural Highway	2,750	B	203	7.4%	2,953	B
Salmon Falls Rd to SR 193	2-Lane Rural Highway	2,750	D	198	7.2%	2,948	D

Source: David Evans and Associates, 2001.

Table 5.4-19 Existing Local Roadway (US-50) Impact Summary (Existing + Project Volumes 2% over Existing)

Road Segment	Geometry/ Classification	Existing		Project		Existing + Project	
		Daily Vol	LOS	Daily Vol	% Inc	Daily Vol	LOS
US Highway 50							
County Line to EDHB/Latrobe	4-Lane Freeway	70,000	D	4,235	6.1%	74,235	D
EDHB/Latrobe to Bass Lake Rd	4-Lane Freeway	62,000	D	4,377	7.1%	66,377	D
Bass Lake Rd to Cambridge Rd	4-Lane Freeway	56,000	C	4,397	7.9%	60,397	C
Cambridge Rd to Cameron Pk Dr	4-Lane Freeway	55,000	C	4,439	8.1%	59,439	C
Cameron Pk Dr to Shingle Springs	4-Lane Freeway	57,000	C	4,607	8.1%	61,607	C
Shingle Springs to E. Shingle Spr	4-Lane Freeway	43,000	B	4,807	11.2%	47,807	C
E. Shingle Spr to New Interchange	4-Lane Freeway	43,000	B	4,856	11.3%	47,856	C

Source: David Evans and Associates, 2001.

volumes by 2% or more (with the exception of US-50 between East Shingle Springs Drive and Greenstone Road, which is analyzed elsewhere for peak hour conditions). Traffic volumes east of Greenstone Road are not expected to increase by 2% or more. The table also shows the resulting level of service along the roadway using capacities as established within spreadsheets associated with the El Dorado County model.

Impacts along US-50 from the Sacramento/El Dorado County line to east of the project site are based on the concept level of service "E", established within *Caltrans' State Route 50 Transportation Concept Repo*rt and additional

information provided by Caltrans. Thus LOS F is considered an unacceptable level of service for US-50.

Based on the methodology and impact analysis criteria established above, the Proposed Project was found to not significantly impact any of the local roadways and highways (including US-50, SR-49, and SR-193) for existing conditions on an average weekday. Therefore, this is considered a ***less-than-significant impact***.

AC Impacts associated with Alternative AC are identical to those identified above for Alternative AB. Based on the methodology and impact analysis criteria established above, the Proposed Project was found to not significantly impact any of the local roadways and highways (including US-50, SR-49, and SR-193) for existing conditions on an average weekday. Therefore, this is considered a ***less-than-significant impact***.

Mitigation 5.4-4 Existing Plus Project- Local Roads Analysis

None Required.

Impact 5.4-5 Cumulative Plus Project- Ramp Merge/Diverge Operations

AA There would be ***no impact*** associated with the No Project Alternative.

AB **Table 5.4-20** provides a summary of cumulative freeway merge/diverge operations along the existing 4-lane freeway for all three peak hour scenarios following the completion of the proposed interchange and proposed hotel/casino. The ramp merge/diverge level of service is applicable to all three scenarios, and uses “rolling terrain” to establish levels of service. The levels of service depicted are based on minimum acceleration/deceleration lengths of 250 ft. (76 meters).

As the below table shows, both the eastbound and westbound on ramps are projected to operate acceptably along a 4-lane facility during all three peak hours. However, the eastbound off-ramp is projected to operate unacceptably at LOS F during the weekday PM peak hour and Saturday peak hour, and the westbound off-ramp is projected to operate unacceptably at LOS E during the AM peak hour. The principal reason for these deficient operations is the LOS F operation along the freeway mainline which results in unacceptable levels of service at the ramp merge/diverge region.

Table 5.4-20 Cumulative Plus Project Freeway Ramp Level of Service (Rolling Terrain)(1)

Ramp	AM Peak Hour	PM Peak Hour	Saturday Peak Hour
Eastbound off-ramp	------	**F**	**F**
Eastbound on-ramp	------	E	E
Westbound off-ramp	**E**(2)	------	D
Westbound on-ramp	E	------	E

Source: David Evans and Associates.
Notes: Length of deceleration and acceleration lanes assumed to be 250 ft.(76 meters).
(1)Level of service calculated using generalized "rolling" terrain instead of exact specific grade/length.
(2) LOS D is the target level of service for freeway diverge analysis, thus LOS E is unacceptable for off-ramp operations. LOS E is the target level of service for freeway mainline and merge (on-ramp) analyses.

Table 5.4-21 provides a similar summary of cumulative freeway merge/diverge operations, but is based on the use of the specific grade and grade length along the freeway. As previously described, it has been determined that the levels of service reported are the same for both alternatives. Again, the levels of service depicted are based on minimum acceleration/deceleration lengths of 250 ft.(76 meters).

As the table below shows, some levels of services are shown to be slightly improved when compared to levels of service calculated when using "rolling" terrain instead of actual specific grades and grade lengths. Specifically, the westbound off-ramp is found to operate acceptably at LOS D for all peak hour scenarios, whereas both on-ramps are projected to operate acceptably at LOS E or better. Therefore, these are considered as ***less-than-significant impacts***.

Table 5.4-21 Cumulative Plus Project Freeway Ramp Level of Service (Specific Grade/Length)(1)

Ramp	Specific Grade	Specific Length (ft)	Level of Service		
			AM Peak Hour	PM Peak Hour	Saturday Peak Hour
Eastbound off-ramp	+4.38	2,525	------	**F**	**F**
Eastbound on-ramp	+2.28	1,150	------	E	D
Westbound off-ramp	-2.28	1,150	D	------	D
Westbound on-ramp	-4.38	2,525	D	------	D

Source: David Evans and Associates.
Notes: Length of deceleration and acceleration lanes assumed to be 250 ft.(76 meters).
(1) Level of service calculated using exact specific grade/length instead of generalized "rolling" terrain.

Using minimum acceleration/deceleration lengths of 250 ft. (76 meters) along a 4-lane facility, the eastbound off-ramp would continue to operate unacceptably at LOS F for cumulative conditions during both the weekday PM peak hour and Saturday peak hour.

The possibility of obtaining improved LOS by extending the deceleration lane leading from the eastbound off-ramp was investigated. The ramp will continue to operate unacceptably regardless of the length of the deceleration lane due to the high volumes and weaving along the freeway which exceeds capacity. Therefore, this is considered to be a ***significant mitigable impact***.

The operation is considered to operate adequately with the development of an auxiliary land between Shingle Springs Drive and the interchange (eastbound direction).

AC

Impacts associated with Alternative AC are identical to those identified above for Alternative AB.

Because of the methodology used to calculate the specific grade and grade length along the freeway, minor differences in the location of the ramp juncture points for each alternative do not change the length of the grade. Therefore, the specific grade and length of the ramps itself were negligible in terms of the level of service of the ramp merge/diverge, and the same specific grade and grade length along the freeway are applicable to analyses for both alternatives. To verify, a detailed analysis was performed for Alternative AB, and a trial and error input of the other possible input values for the Alternative AC was performed. This trial and error input included the ramp lengths, grades and volumes for Alternative AC, as well as extreme ramp lengths, grades and volumes outside the range of possibilities for Alternative AC. This trial and error analysis confirmed that the merge/diverge levels of service for the all alternatives and peak hour scenarios correspond to those calculated for Alternative AB. Therefore, for analyses which provide for the input of specific grades and grade lengths, the same values are used for both alternatives since the input for each result in exactly the same level of service results.

A free flow speed of 48 kph (30 mph) was used for both project alternatives. This default value was used to approximate the design speed of 80 kph (50 mph) at inlet and exit noses of the ramps associated with both alternatives, and 40 kph

(25 mph) along the remainder of the ramp associated specifically with Alternative AC.

As the applicable tables for Alternative AB show, the westbound off-ramp is found to operate acceptably at LOS D for all peak hour scenarios, whereas both on-ramps are projected to operate acceptably at LOS E or better. Therefore, these are considered as ***less-than-significant impacts***.

Using minimum acceleration/deceleration lengths of 250 ft. (76 meters) along a 4-lane facility, the eastbound off-ramp would operate unacceptably at LOS F for cumulative conditions during both the weekday PM peak hour and Saturday peak hour. The ramp will continue to operate unacceptably regardless of the length of the deceleration lane due to the high volumes and weaving along the freeway which exceeds capacity. Therefore, this is considered to be a ***significant mitigable impact***.

The operation is considered to operate adequately with the development of an auxiliary land between Shingle Springs Drive and the interchange (eastbound direction).

Mitigation 5.4-5 Cumulative Plus Project- Ramp Merge/Diverge Operations

The impact identified above will be reduced to a ***less than significant*** level with the implementation of the following mitigation:

(A) Provide an eastbound auxiliary lane for AB and AC between the eastbound East Shingle Springs Drive on-ramp and the eastbound off-ramp to the Rancheria. The provision of this auxiliary lane would result in acceptable LOS D or better operation for the eastbound off-ramp during all three peak hour scenarios during the cumulative year.

Impact 5.4-6 Cumulative Plus Project- Peak Hour Freeway Mainline Operations

AA There would be ***no impact*** associated with the No Project Alternative.

AB **Table 5.4-22** shows the freeway mainline operations along the existing 4-lane freeway for all three peak hour scenarios during the cumulative year 2025 following the completion of the proposed interchange and proposed hotel and casino.

Table 5.4-22 Cumulative Plus Project (4-lanes) Peak Hour Freeway Mainline Level of Service

Freeway Segment	Freeway Level of Service(1)					
	Cumulative (no project)			Cumulative plus Project		
	AM Pk Hr	PM Pk Hr	Sat Pk Hr	AM Pk Hr	PM Pk Hr	Sat Pk Hr
Eastbound US-50 (between E. Shingle Springs & Rancheria)	D	E	E	D	**F**	E
Eastbound US-50 (between Rancheria & Greenstone)	D	E	E	D	E	E
Westbound US-50 (between Greenstone & Rancheria)	E	D	D	E	D	E
Westbound US-50 (between Rancheria & E. Shingle Springs)	E	D	D	E	D	E

Source: David Evans and Associates.
Notes: (1) Free Flow speed varies - "Ideal" Free Flow Speed of 65 mph adjusted to account for specific hwy geometry.

As the above table shows, the freeway is projected to operate acceptably at LOS E or better for both east and west of the proposed interchange along both directions during AM and Saturday peak hour conditions. During the PM peak hour, the freeway is projected to operate acceptably at LOS E or better both east and west of the proposed interchange along the westbound direction, and east of the proposed interchange along the eastbound direction. Therefore, these are considered ***less-than-significant impacts***.

However, the freeway is projected to operate unacceptably at LOS F west of the proposed interchange along the eastbound direction during the PM peak hour. This is considered to be a ***significant mitigable impact***.

The operation is considered to operate adequately with the development of an auxiliary land between Shingle Springs Drive and the interchange (eastbound direction).

AC Impacts associated with Alternative AC are identical to those identified above for Alternative AB.

As the above table shows, the freeway is projected to operate acceptably at LOS E or better for both east and west of the proposed interchange along both directions during AM and Saturday peak hour conditions. During the PM

peak hour, the freeway is projected to operate acceptably at LOS E or better both east and west of the proposed interchange along the westbound direction, and east of the proposed interchange along the eastbound direction. Therefore, these are considered ***less-than-significant impacts***.

However, the freeway is projected to operate unacceptably at LOS F west of the proposed interchange along the eastbound direction during the PM peak hour. This is considered to be a ***significant mitigable impact***.

The operation is considered to operate adequately with the development of an auxiliary land between Shingle Springs Drive and the interchange (eastbound direction).

Mitigation 5.4-6 Cumulative Plus Project- Peak Hour Freeway Mainline Operations

The impact identified above will be reduced to a ***less than significant*** level with the implementation of the following mitigation:

(A) Provide an eastbound auxiliary lane for AB and AC between the eastbound East Shingle Springs Drive on-ramp and the eastbound off-ramp to the Rancheria. The provision of this auxiliary lane would result in acceptable LOS D or better operation along the 3-lane weaving section (which includes an eastbound auxiliary lane between the eastbound East Shingle Springs Drive on-ramp and the eastbound off-ramp to the Rancheria) during all three peak hour scenarios during the cumulative year.

Impact 5.4-7 Cumulative Plus Project- Interchange Intersection Operations

AA There would be ***no impact*** associated with the no project alternative.

AB Since there are no intersections associated with the Flyover Alternative, there would be ***no impact*** associated with the Flyover Alternative.

AC Interchange operations are analyzed only for Alternative AC, since the modified trumpet design of Alternative AB contains no intersections to analyze. If constructed as a diamond interchange as proposed for Alternative AC, the interchange would include two intersections.

Unsignalized Intersection Analysis

Table 5.4-23 provides a summary of cumulative plus project intersection operations following the completion of the interchange and hotel and casino for unsignalized intersections.

Table 5.4-23 Cumulative Plus Project Unsignalized Level of Service

Intersection	AM Peak Hour		PM Peak Hour		Saturday Peak Hour	
	LOS	Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)
New Shingle Springs Rancheria Road / Westbound ramps	A	(1.3)	A	(1.0)	A	(1.2)
New Shingle Springs Rancheria Road / Eastbound ramps	B	(5.5)	C	(12.0)	**F**	**(55.1)**

Source: David Evans and Associates.
Notes: Applicable only for Alternative AC since Alternative AB includes no intersections. Delay for unsignalized intersections based on overall average vehicle delay.

As the above table shows, the eastbound ramp intersection would not operate at an acceptable level of service as an unsignalized intersection. This is considered to be a ***significant mitigable impact***.

Signalized Intersection Analysis

Both of the intersections would meet Caltrans signal warrants for rural conditions, although the westbound ramps are warranted only for weekday PM peak hour and Saturday peak hour conditions, and the eastbound ramps are warranted only for Saturday peak hour conditions. It is thus recommended that at a minimum the eastbound ramp intersection be signalized as part of the interchange construction. Although not necessary to provide acceptable level of service operation, it is also recommended that the westbound ramp intersection also be signalized to provide efficient operation.

Table 5.4-24 below shows the level of service for the two intersections following signalization for cumulative conditions.

Table 5.4-24 Cumulative plus Project Signalized Level of Service

Intersection	AM Peak Hour		PM Peak Hour		Saturday Peak Hour	
	LOS	Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)
New Shingle Springs Rancheria Road / Westbound ramps	A	(3.4)	A	(3.6)	B	(7.0)
New Shingle Springs Rancheria Road / Eastbound ramps	B	(8.3)	B	(6.8)	B	(8.4)

Source: David Evans and Associates.
Notes: Applicable only for Alternative AC since Alternative AB includes no intersections.

Interchange Queuing Analysis

Using the SYNCHRO software analysis described previously, the queuing along each of the intersection approaches were analyzed. **Table 5.4-25** summarizes the queuing which would occur along each of the intersection approaches for cumulative conditions following the completion of the interchange project for signalized intersections.

Table 5.4-25 Cumulative Plus Project Intersection Queuing for Signalized Intersections

Movement	Available Queue Capacity (ft)	AM Peak Hour Queue (ft)		PM Peak Hour Queue (ft)		Saturday Peak Hour Queue (ft)	
		50th Percentile	95th Percentile	50th Percentile	95th Percentile	50th Percentile	95th Percentile
New Project Access / Westbound US-50 Ramps							
Northbound	163	0	0	0	0	0	0
Southbound Thru	760+	8	28	25	65	46	91
Southbound Right	760+	21	59	53	133	134	340
Westbound	1,275	56	93	54	94	70	131
New Project Access / Eastbound US-50 Ramps							
Southbound	163	18	46	50	117	87	**174 [11]**
Eastbound	983	92	140	125	172	134	216

Source: David Evans and Associates.

As the above shows, the queuing capacity for each of the approaches is expected to easily accommodate the projected queues for each of the cumulative peak hour scenarios for Alternative AC, with the exception of the southbound approach to the eastbound ramp intersection during Saturday peak

hour conditions. Although the queue capacity is adequate for more than 50% of the Saturday peak hours (as shown by the 50th percentile queue), it would exceed the link capacity between the westbound and eastbound ramps during at least 5% of the Saturday peak hours (as shown by the 95th percentile queue). Even then, the excess queue would amount only to a single vehicle.

This excess queue would in effect stretch through the westbound ramp intersection to the section of the new roadway north of the interchange. If signalized and coordinated with the signal for the eastbound ramps, the signal timing coordination could ensure that the eastbound ramp intersection would provide additional or offset green time to clear the westbound intersection. Additionally, even in a worse case scenario where traffic did extend through the westbound ramp intersection, these vehicles would not block any of the predominate movements through the intersection, since the other movements are associated primarily with southbound rights and westbound off-ramp right turns to the Rancheria. The only movements which would potentially be blocked would be associated with vehicles which intended to use the interchange to reverse their direction of travel along US-50. If the interchange were congested, it is doubtful anyone would negotiate this movement at this particular interchange.

Mitigation 5.4-7 Cumulative Plus Project- Interchange Intersection Operations

The impact identified above will be reduced to a ***less than significant*** level with the implementation of the following mitigation:

A) It is recommended that the two newly created intersections under AC be signalized, and that the signals be coordinated to assure that queues would not develop which would block the westbound ramp intersection.

Impact 5.4-8 Cumulative Plus Project- Ramp Metering

AA There would be ***no impact*** associated with the No Project alternative.

AB **Table 5.4-26** provides a summary of the ramp metering conditions along the new on-ramps for Saturday peak hour conditions. Saturday peak hour conditions are when traffic volumes along the new on-ramps would be heaviest. This is considered to be a ***significant mitigable impact***. The table

shows that the ramp metering at the proposed on-ramps would operate without the queue exceeding the storage length if metering rates were as provided.

Table 5.4-26 Ramp Metering

On-Ramp	Storage Length	Storage Vehicles	Peak Hour Volumes	Metering Rate (vph)
Westbound on-ramp	472 ft (144 meters)	16	615	600
Eastbound on-ramp	640 ft (195 meters)	22	305	285

Source: David Evans and Associates.

AC Impacts associated with Alternative AC are identical to those identified above for Alternative AB. This is considered to be a ***significant mitigable impact***.

Mitigation 5.4-8 Cumulative Plus Project- Ramp Metering

The impact identified above will be reduced to a ***less than significant*** level with the implementation of the following mitigation:

(A) Implement the recommended metering rates along the newly created on-ramps.

Impact 5.4-9 Cumulative Plus Project- Local Roads Analysis

AA There would be ***no impact*** associated with the no project alternative

AB **Table 5.4-27** provides a summary of all of the local roadway and highway segments within El Dorado County along which the project is projected to increase existing traffic volumes by 2% or more. The table also shows the resulting level of service along the roadway using capacities as established within spreadsheets associated with the El Dorado County model.

Roadway geometries, and corresponding capacities, for cumulative conditions are based on the roadway network geometries included within the 2022 CIP (Capitol Improvement Program) data network files contained with the 1999 El Dorado County travel demand model.

Table 5.4-28 provides a summary of the portion of US-50 within El Dorado County along which the project is projected to increase existing traffic volumes by 2% or more (with the exception of US-50 between East Shingle

Table 5.4-27 Cumulative Local Roadway Impact Summary (Cumulative + Project Volumes 2% over Cumulative No Project)

Road /Segment	Geometry/Classification	Cumulative		Project		Cumulative + Project	
		Daily Vol	LOS	Daily Vol	% Inc	Daily Vol	LOS
Big Cut Rd.							
Benham St to Quarry Rd	2-Lane Rural Local Rd	1,388	B	28	2.0%	1,416	B
Buckeye Rd.							
E. Shingle Springs to	2-Lane Rural Local Rd	469	B	59	12.6%	528	B
Mother Lode Rd (W)							
Greenstone Rd.							
Mother Lode to US 50	2-Lane Rural Minor Collector	922	B	322	34.9%	1,244	B
US 50 to Green Vly Rd	2-Lane Rural Minor Collector	3,784	B	268	7.1%	4,052	B
Green Valley Rd.							
Lotus Rd to Greenstone	4-Lane Divided Urban Minor	4,308	A	238	5.5%	4,546	A
	Arterial (Upgraded)						
Larsen Rd.							
Barkley Rd to North Canyon Rd	2-Lane Rural Local Rd	618	B	21	3.4%	639	B
Lotus Rd.							
Green Vly Rd to GoldHill Rd	2-Lane Rural Minor Arterial	9,077	D	224	2.5%	9,301	D
GoldHill Rd to Thompson Hill	2-Lane Rural Minor Arterial	6,360	C	207	3.3%	6,567	C
Thompson Hill to Bassi Rd	2-Lane Rural Minor Arterial	6,360	E	207	3.3%	6,567	E
Bassi Rd to SR 49	2-Lane Rural Minor Arterial	6,360	E	207	3.3%	6,567	E
Missouri Flat Rd.							
MO Flat Conn to Pleasant Valley Rd	2-Lane Rural Minor Arterial	8,236	D	184	2.2%	8,420	D
Mother Lode Dr.							
Greenstone to Pleasant Vly Rd	2-Lane Rural Major Collector	11,372	E	279	2.5%	11,651	E
Pleasant Valley Rd.							
Mother Lode Dr to El Dorado Rd	2-Lane Rural Minor Arterial	9,166	E	250	2.7%	9,416	E
El Dorado Rd to SR 49	2-Lane Rural Minor Arterial	11,000	E	243	2.2%	11,243	E
SR 49							
Mo Flat Rd to Pleasant Vly (DS)	2-Lane Rural Highway	5,792	D	132	2.3%	5,924	D
US 50 to SR 193 (N)	2-Lane Rural Highway	6,200	E	152	2.5%	6,352	E
SR 193 (N) to Gold Hill	2-Lane Rural Highway	4,487	E	108	2.4%	4,595	E
Gold Hill Rd to Cold Springs	2-Lane Rural Highway	2,362	C	101	4.3%	2,463	C
Cold Springs to Lotus Rd	2-Lane Rural Highway	3,545	D	112	3.2%	3,657	D
Lotus Rd to Marshall Rd.	2-Lane Rural Highway	6,026	C	235	3.9%	6,261	C
Marshall to Salmon Falls Rd	2-Lane Rural Highway	4,509	B	203	4.5%	4,712	B
Salmon Falls Rd to SR 193	2-Lane Rural Highway	6,589	C	198	3.0%	6,787	C

Source: David Evans and Associates.

Springs Drive and Greenstone Road, which is analyzed elsewhere for peak hour conditions). Traffic volumes east of Greenstone Road are not projected to increase by 2% or more. The table also shows the resulting level of service along the roadway using capacities as established within spreadsheets associated with the El Dorado County model.

Based on the methodology and impact analysis criteria established above, the Proposed Project was found to not significantly impact any of the local roadways and highways (including SR-49 and SR-193, but excluding US-50) for cumulative conditions on an average weekday. Therefore, this is considered a ***less-than-significant impact***.

Based on the methodology and impact analysis criteria established above, the Proposed Project was found to not significantly impact US-50 within El Dorado County east of El Dorado Hills Boulevard. Therefore, this is considered a ***less-than-significant impact***.

Table 5.4-28 Cumulative Local Roadway (US-50) Impact Summary (Cumulative + Project Volumes 2% over Cumulative No Project)

		Cumulative		Project		Cumulative + Project		
Segment	**Geometry/ Classification**	**Daily Vol(1)**	**LOS**	**Daily Vol**	**% Increase**	**Daily Vol**	**LOS**	**Target LOS E or Better? (2)**
County Line to EDHB/Latrobe	6-Lane Freeway	**135,000**	**F***	4,235	3.1%	**139,235**	**F***	**NO**
EDHB/Latrobe to Bass Lake Rd	6-Lane Freeway	111,347	D	4,377	3.9%	115,724	E	Yes
Bass Lake Rd to Cambridge Rd	6-Lane Freeway	98,896	D	4,397	4.4%	103,293	D	Yes
Cambridge Rd to Cameron Pk Dr	6-Lane Freeway	86,247	C	4,439	5.1%	90,686	C	Yes
Cameron Pk Dr to Shingle Springs	6-Lane Freeway	72,045	C	4,607	6.4%	76,652	C	Yes
Shingle Springs to E. Shingle Spr	4-Lane Freeway	63,285	D	4,807	7.6%	68,092	D	Yes
E. Shingle Spr to New Interchange	4-Lane Freeway	61,690	C	4,856	7.9%	66,546	D	Yes

Source: David Evans and Associates.
Notes: (1) Cumulative daily volumes are 2022 year volumes as reported within the 1999 version of the "*El Dorado County Travel Demand Forecasting Model,"* with exception of County Line to EDHB/Latrobe which was supplied by Caltrans.
(2) Concept level of service for US-50 is LOS E based on *Caltrans' State Route 50 Transportation Concept Rep*ort.
* Deficient Operation

However, as noted, it is anticipated that the section of US-50 between the El Dorado County Line and El Dorado Hills Boulevard will operate at a deficient LOS F operation without the project. The addition of project traffic will add

to the projected adverse operation within this section of US-50. This is considered to be a ***significant mitigable impact***.

To address this incremental cumulative impact, it is recommended that the project participate in a fair share contribution for future master planned improvements as identified by Caltrans and El Dorado County for this section of freeway.

AC Impacts associated with Alternative AC are identical to those identified above for Alternative AB.

Based on the methodology and impact analysis criteria established above, the Proposed Project was found to not significantly impact any of the local roadways and highways (including SR-49 and SR-193, but excluding US-50) for cumulative conditions on an average weekday. Therefore, this is considered a ***less-than-significant impact***.

Based on the methodology and impact analysis criteria established above, the Proposed Project was found to not significantly impact US-50 within El Dorado County east of El Dorado Hills Boulevard. Therefore, this is considered a ***less-than-significant impact***.

However, as noted, it is anticipated that the section of US-50 between the El Dorado County Line and El Dorado Hills Boulevard will operate at a deficient LOS F operation without the project. The addition of project traffic will add to the projected adverse operation within this section of US-50. This is considered to be a ***significant mitigable impact***.

To address this incremental cumulative impact, it is recommended that the project participate in a fair share contribution for future master planned improvements as identified by Caltrans and El Dorado County for this section of freeway.

Mitigation 5.4-9 Cumulative Plus Project- Local Roads Analysis

The following mitigation measure will reduce the cumulative impact to a ***less-than-significant*** level.

(A) Pursuant to Section 10.8 of Tribal State Compact, the tribal government will contribute a fair share contribution to future master

planned improvements as identified by Caltrans and El Dorado County for the section of US-50 between the El Dorado County Line and El Dorado Hills Boulevard.

5.5 Air Quality

5.5.1 Introduction

The Air Quality section of the EIR/EA analyzes the potential short-term, long-term, and cumulative impacts resulting from the construction and operation of the Proposed Project and alternatives. The Air Quality discussion will analyze the air quality conditions in the proposed Shingle Springs Interchange region.

Of particular concern with respect to this project is the formation of ozone, as El Dorado County, the location of the Shingle Springs Interchange, is part of a federal ozone nonattainment area. In addition, the air quality analysis addresses emissions of carbon monoxide (CO) and particulate matter. Carbon monoxide is of concern because it is associated with motor vehicle activity. Particulate matter is of concern because it is associated with construction activity.

5.5.2 Environmental Setting

Meteorology and Climate

Shingle Springs is located in the County of El Dorado, which lies within the Mountain Counties Air Basin (MCAB). The climate of the MCAB is influenced by the foothill and mountainous terrain unique to the counties included in the MCAB. El Dorado County is bordered by the Sacramento Valley to the west and the Nevada State line to the east with the western portion of the County consisting of rolling Sierra Nevada foothills, and the central and eastern portion of the County consisting of granite peaks reaching up to 10,000 feet in elevation. The climate of El Dorado County is characterized by hot dry summers and cool moist winters. The western portion of the County is characterized by higher temperatures and lower annual rainfall, and the central and eastern portions of the County are characterized by lower temperatures and higher annual rainfall.

Air quality is affected by the rate, amount, and location of pollutant emissions and the associated meteorological conditions that influence movement and dispersal of pollutants. Atmospheric conditions including wind speed, wind direction and air temperature, in combination with local surface topography (i.e., geographic features such as mountains and valleys), determine air pollutant impacts on local air quality.

The project site is best characterized as a rural environment with scattered homes, various facilities associated with the Rancheria, and Highway 50 extending in an east-west direction through the project area. Air quality in the project area is influenced mostly by pollutant

transport from upwind areas, such as the Sacramento and San Francisco Bay metropolitan areas, but also by local emissions sources, such as wood burning stoves and fireplaces during the winter months and vehicles using area roadways and Highway 50. There are no manufacturing or mining activities in the vicinity of the proposed project site.

Air Quality Monitoring

Table 5.5-1 Presents air quality monitoring data for three pollutants: CO, ozone, and PM_{10}. The data presented in **Table 5.5-1** are for the latest three years with available data for the full year. The data shown are for the Gold Nugget Way monitoring station in Placerville, and the Highway 193 station in Cool, which are the stations closest to the project site for each of the three pollutants.

Table 5.5-1 Summary of Carbon Monoxide, Ozone, and PM10 Monitoring Data

Station Location	1998	1999	2000
Carbon Monoxide (CO)			
Placerville – Golden Nugget Way			
Highest 8-hour concentration (ppm)	0.90	0.88	0.96
Days above standard (a)	0	0	0
PM 10			
Placerville – Golden Nugget Way			
Highest 24-hour concentration (ug/m3)	41	49	38
Geometric mean (ug/m3)	13	16	15
Arithmetic mean (ug/m3)	15	18	17
Percentage of days above standard (b)	0%	0%	0%
Ozone (O_3)			
Cool – Highway 193			
1st High (ppm)	0.163	0.144	0.128
2nd High (ppm)	0.144	0.135	0.126
Days above standard (c)	30	36	34
Placerville – Golden Nugget Way			
1st High (ppm)	0.139	0.129	0.119
2nd High (ppm)	0.128	0.127	0.113
Days above standard (c)	22	21	19

Source: California Air Resources Board - http://www.arb.ca.gov
(a) Days above standard = days above state 8-hour standard of 9 ppm.
(b) Days above standard = days above state daily standard of 50 ug/m^3
(c) Days above standard = days above state 1-hour standard of 0.09 ppm.

El Dorado County has been designated an "unclassified" area for the state CO air quality standards, and an "unclassified/attainment" area for the federal CO standards. As shown in **Table 5.5-1**, the CO monitoring station closest to the project site have not exceeded the CO air quality standard for the three-year period. El Dorado County is considered a nonattainment area for ozone because concentrations of this pollutant sometimes exceed the standards. As shown in **Table 5.5-1**, both the state and federal ozone standards are exceeded at the stations closest to the project site.

El Dorado County is designated an "unclassified" area for the federal PM_{10} standard, and a nonattainment area for the state PM_{10} standard. **Table 5.5-1** shows the state PM_{10} daily standard of 50 ug/m^3 has not been exceeded during the three-year period at the station closest to the project site.

Emissions Inventory

Table 5.5-2 presents emissions currently generated in El Dorado County. The information presented in **Table 5.5-2** is divided into emission source categories. The category that generates the largest amounts of ROG and NO_x emissions in El Dorado County is On-Road Motor Vehicles. The category that generates the largest amount of PM_{10} emissions is shown in **Table 5.5-2** as Miscellaneous Processes; the two largest subcategories within this one category are Residential Fuel Combustion and Unpaved Road Dust.

5.5.3 Regulatory Setting

Air quality management responsibilities exist at local, state, and federal levels of government. Air quality management planning programs developed during the past few decades have generally been in response to requirements established by the federal Clean Air Act (CAA). However, the enactment of the California Clean Air Act of 1988 (CCAA) has produced additional changes in the structure and administration of air quality management programs in California.

Air Pollutants and Ambient Standards

Both the U.S. Environmental Protection Agency (EPA) and the California Air Resources Board (CARB) have established ambient air quality standards for common pollutants. These ambient air quality standards indicate levels of contaminants that represent safe levels, to avoid specific adverse health effects associated with each pollutant. The ambient air quality standards cover what are called "criteria" pollutants because the health and other effects of each pollutant are described in criteria documents.

Table 5.5-2 El Dorado County Emissions Inventory for 2000

	Carbon Monoxide		Reactive Organic Gases		Nitrogen Oxides		Inhalable Particulate Matter	
Emission Category	**Tons per Day**	**Tons per Year**	**Tons per Day**	**Tons per Year**	**Tons per Day**	**Tons per Year**	**Tons per Day**	**Tons per Year**
Fuel Combustion	7.1	1,775	0.3	75	0.4	100	0.7	175
Waste Disposal	0.1	25	0.0	0.0	0.0	0.0	0.0	0.0
Cleaning & Surface Coatings	0.0	0.0	1.1	275	0.0	0.0	0.0	0.0
Petroleum Production & Marketing	0.0	0.0	0.2	50	0.0	0.0	0.0	0.0
Industrial Processes	0.0	0.0	0.0	0.0	0.0	0.0	0.2	50
Solvent Evaporation	0.0	0.0	2.9	725	0.0	0.0	0.0	0.0
Miscellaneous Processes	39.5	9,875	2.7	675	0.7	175	19.5	4,875
On-Road Motor Vehicles	109.4	27,350	10.5	2,625	9.8	2,450	0.3	75
Other Mobile Sources	45.8	11,450	7.2	1,800	4.1	1,025	0.4	100
Natural Sources	2.4	600	0.1	25	0.1	25	0.5	125
Total	**204.3**	**51,075**	**25.0**	**6,250**	**15.1**	**3,775**	**21.6**	**5,400**

Source: Estimates of daily emissions are from CARB website: http://www.arb.ca.gov/emisinv/emsmain/emsmain.htm. The estimates of annual emissions are based on a factoring of daily values.
Note: 2000 is the latest emissions inventory available from the California Air Resources Board (CARB). The sum of values may not equal total shown due to rounding.

The federal and state ambient air quality standards and a summary of associated health effects are presented in **Table 5.5-3**. The federal and state ambient standards were developed independently with differing purposes and methods, although both processes attempted to avoid health-related effects. As a result, the federal and state standards differ in some cases. In general, the California state standards are more stringent. This is particularly true for ozone and PM_{10}.

Ozone

Ozone is not emitted directly into the air but is formed by a photochemical reaction in the atmosphere. Ozone precursors, which include ROG and NO_x, react in the atmosphere in the presence of sunlight to form ozone. Because photochemical reaction rates depend on the intensity of ultraviolet light and air temperature, ozone is primarily a summer air pollution problem. Ozone is a respiratory irritant and an oxidant that increases susceptibility to respiratory infections and can cause substantial damage to vegetation and other materials. Once formed, ozone remains in the atmosphere for one or two days. It is then eliminated through chemical reaction with plants and by rainout and washout.

Table 5.5-3 Ambient Air Quality Standards Applicable in California

		Parts Per Million		Micrograms per Cubic Meter		Violation Criteria	
Pollutant	**Average Time**	**CA**	**National**	**CA**	**National**	**CA**	**National**
Ozone	1 hour	0.09	0.12	180	235	If exceeded	If exceeded on more than 3 days in 3 years
Carbon Monoxide	8 hours	9.0	9	10,000	10,000	If exceeded	If exceeded on more than 1 day per year
	1 hour	20	35	23,000	40,000	If exceeded	If exceeded on more than 1 day per year
Inhalable Particulate Matter	Annual geometric mean	N/A	N/A	30	N/A	If exceeded	N/A If exceeded If exceeded on more than 1 day per year
	Annual arithmetic mean	N/A	N/A	N/A	50	N/A	
	24 hours	N/A	N/A	50	150	N/A	

Source: CARB, 1999.
Notes: All standards are based on measurements at 25 C and 1 atmosphere pressure.
National standards shown are the primary (health effects) standards.
N/A = not applicable.

State and federal standards for ozone have been set for a one-hour averaging time. The state ozone standard is 0.09 parts per million (ppm), not to be exceeded. The federal one-hour standard is 0.12 ppm and is not to be exceeded more than three times in any three-year period at a single point of measurement. A new federal standard for ozone was issued in July 1997 by Executive Order of the President. The new ozone standard has been set at a concentration of 0.08 ppm ozone measured over 8 hours. In May 1999 a federal appeals court overturned the new ozone standard, preventing the federal government from taking actions based on the new standard. In February 2001, the U.S. Supreme Court rejected the grounds for the appellate court decision. However, the case was returned to the appellate court for additional consideration, preventing the federal government from taking actions based on the new standard. Currently, El Dorado County is classified a nonattainment area for the state standards and a severe nonattainment area for the one-hour federal ozone standard.

A new federal standard for particulate matter less than 2.5 microns in diameter ($PM_{2.5}$) was issued in July 1997 by Executive Order of the President. $PM_{2.5}$ is sometimes referred to as "fine particulate matter". The new $PM_{2.5}$ standard has been set at a concentration of 15μμg/m^3 annually and 65μμg/m^3 daily. As with the new ozone standard, in May 1999 a federal appeals court overturned the new $PM_{2.5}$ standard, U.S. Supreme Court rejected the grounds for the appellate court decision, and the case was returned to the appellate court for additional consideration. The federal standards for PM_{10} are being maintained so that relatively larger, courser particulate matter continue to be regulated. The ARB and local air quality management districts in California have developed a $PM_{2.5}$ monitoring network. The new network is collecting data for various purposes including $PM_{2.5}$ attainment/ nonattainment designations, development and tracking of implementation plans, and assistance in health studies and other research activities.

PM_{10} and $PM_{2.5}$ can reach the lungs when inhaled, resulting in health concerns related to respiratory disease. Suspended particulate matter can also affect vision or contribute to eye irritation. PM_{10} can remain in the atmosphere for up to seven days before removal by gravitational settling, rainout and washout. Currently El Dorado County is "unclassified" for State And Federal PM_{10} Standards.

Federal Clean Air Act

The 1970 amendments to the federal CAA established a joint state and federal program to control air pollution. Pursuant to Sections 109 and 110 of the amendments, the EPA established federal air quality standards (**Table 5.5-3**). The amendments also required that states submit SIPs providing for attainment of the federal standards within certain periods of time. Because many of the original SIPs failed to bring about attainment, the CAA was amended in 1977. The federal CAA amendments of 1977 required all states to attain the federal standards by December 31, 1987. These amendments required states to submit plans that demonstrated attainment of the applicable standards by the statutory deadline.

Again, certain areas of the nation failed to meet the December 1987 deadline. In 1990, new federal CAA amendments were signed into law. Depending on the severity of an area's air pollution problem, the new amendments provided from 5 to 20 years for areas to attain the federal standards. The amendments also set new planning requirements for federal nonattainment areas.

Since El Dorado County has been designated nonattainment for national and state ozone standards, plans have been developed to achieve attainment of those standards. Under the federal CAA amendments of 1990, a federally-mandated plan (referred to as a SIP) was

developed for the ozone nonattainment area referred to as the Sacramento Valley Area Air Quality Maintenance Area, which includes all of Sacramento and Yolo counties, a portion of Solano County, all of El Dorado and Placer counties, except for the Lake Tahoe Air Basin, and the southern portion of Sutter County (El Dorado County Air Pollution Control District, 1994). This plan, the Sacramento Area Regional Ozone Attainment Plan, concluded that ozone attainment could not be met by the 1999 deadline and called for a change in classification from "serious" to "severe." EPA reclassified the Sacramento Valley Area Air Quality Maintenance Area to "severe" ozone nonattainment in 1995.

Under the federal CAA amendments of 1990, federal agencies must make a determination of conformity with the applicable SIP before taking any action on a Proposed Project. In 1993, EPA published a rule (referred herein as the "general conformity rule") that indicates how most federal agencies, including the Bureau of Indian Affairs, are to determine whether a conformity determination is required, and if so, how to make such a determination (EPA, 1993). The rule establishes "de minimis" emissions thresholds that are used to determine whether a conformity determination is required. If emissions increases due to a Proposed Project would exceed the applicable de minimis thresholds, then the rule establishes specific criteria through which a federal agency must demonstrate that the Proposed Project would conform to the SIP, despite the greater-than-de-minimis increase in emissions. In this case, the applicable de minimis thresholds, based on the current the "severe" ozone nonattainment classification of El Dorado County (and the rest of the Sacramento Valley Area Air Quality Maintenance Area), are 25 tons per year for VOC emissions and 25 tons per year for NO_x emissions. Based on the "unclassified" designation for El Dorado County, the de minimis threshold for PM_{10} is 100 tons per year.

The Clean Air Act requires that transportation projects, such as the building of new roads, that are located in nonattainment areas, and that are financed, at least in part, by federal money or approved by federal agencies must conform with mobile source emissions budgets established in the SIP. Most commonly, the demonstration of transportation conformity is made by including the project in the MTIP, which is prepared and maintained by SACOG. SACOG prepares and maintains the MTIP for its jurisdictions, which includes a portion of El Dorado County that includes the study area, and includes all or portions of five other counties in the Sacramento area. By including a project in the MTIP, SACOG shows that the project is consistent with the area's Metropolitan Transportation Plan and is in conformance with the SIP. This process is referred to as a regional transportation conformity determination. However, because of the need to proceed on an expedited schedule, the BIA has conducted a project-level transportation conformity determination of the Proposed Project. This project-level analysis replicates the analysis process used by SACOG. This project-level

transportation conformity determination compares forecasts of regional air pollutants to thresholds, sometimes referred to as “emissions budgets”.

Pursuant to state air quality planning requirements, the El Dorado County California Clean Air Act Plan was developed to reduce population exposure to unhealthful levels of ozone through tighter industry controls, cleaner cars and trucks, cleaner fuels, and increased commute alternatives (El Dorado County Air Pollution Control District, 1993). This state-mandated plan is updated on a triennial basis. The Sacramento Area Regional Ozone Attainment Plan, discussed above in connection with federal air quality planning requirements, also served as one of the updates to the state-mandated ozone plan.

California Clean Air Act

The CCAA substantially added to the authority and responsibilities of the state’s air pollution control districts. The CCAA establishes an air quality management process that generally parallels the federal process. The CCAA, however, focuses on attainment of the state ambient air quality standards that, for certain pollutants and averaging periods, are more stringent than the comparable federal standards.

The CCAA requires that air districts prepare an air quality attainment plan if the district violates state air quality standards for CO, sulfur dioxide (SO_2), NO_x, or ozone. No locally prepared attainment plans are required for areas that violate the state PM_{10} standards. The CCAA requires that the state air quality standards be met as expeditiously as practicable, but it does not set precise attainment deadlines. Instead, the act establishes increasingly stringent requirements for areas that will require more time to achieve the standards. The least stringent requirements apply to areas expected to achieve air quality standards by the end of 1994. The most stringent requirements apply to areas that cannot achieve the standards until after 1997.

The air quality attainment plan requirements established by the CCAA are based on the severity of air pollution problems caused by locally generated emissions. Upwind air pollution control districts are required to establish and implement emission control programs commensurate with the extent of pollutant transport to downwind districts.

Local Air Quality Management

SACOG provides regional air quality planning for the multi-county air quality maintenance area. However, the El Dorado County Air Pollution Control District (APCD) is the local agency with air pollution control authority in El Dorado County. The El Dorado County

APCD is tasked with implementing certain programs and regulations required by the federal CAA, and the CCAA.

5.5.4 Impacts And Mitigation Measures

Significance Criteria

Under the federal CAA amendments of 1990, federal agencies must make a determination of conformity with the applicable SIP before taking any action on a Proposed Project. The U.S. EPA has established "de minimis" emissions thresholds that are used to determine whether a general conformity determination is required. The applicable de minimis thresholds are 25 tons per year for VOC emissions, 25 tons per year for NO_x emissions, and 100 tons per year for PM_{10} emissions.

Carbon monoxide concentrations exceeding state or national air quality standards are considered to have a significant impact.

Methodology

Potential air emissions were assessed. The project site and alternatives were evaluated for consistency with adopted plans and policies, and ordinances, as well as compliance with federal, state and local rules and regulations.

Assumed meteorological conditions are important factors in estimating CO concentrations. The meteorological conditions assumed for this air quality report are from the *Transportation Project-Level Carbon Monoxide Protocol* (Institute of Transportation Studies, University of California, Davis 1996). The following meteorological assumptions were used:

Wind Speed (U) = 0.5 meters per second
Wind Direction = Worst Case
Atmospheric Stability Class = 7(G)
Mixing Height = 1,000 meters
Sigma Theta = 5 degrees
Surface Roughness = 100 centimeters
Temperature = 1.8^{o}C
Altitude = 0 meters

Impacts/ Mitigation

Impact 5.5-1 Construction Emissions

AA No action will occur as a result of the No Project/Action Alternative. Under the No Project/Action Alternative, neither the proposed interchange nor the proposed hotel/casino would be constructed. ***No impact*** will occur under the No Project/Action Alternative.

AB, AC Construction of the Proposed Project would result in the temporary generation of emissions of ROG, NOx, and PM_{10}. Construction-related emissions result from construction equipment exhaust, construction employee commute travel, and fugitive dust from land clearing, earthmoving, and wind erosion of exposed soil. Additionally, asphalt paving activity generates emissions of ROG. Estimate of emissions of ROG, NOx and PM_{10} generated during construction, and assumptions used in developing the estimates of construction-related emissions are presented in **Appendix E**.

Construction equipment usage rates, and total square footage for site grading and asphalt paving were based on values specific to the Proposed Project. Emissions associated with construction employee commute travel were estimated using the URBEMIS7G program.

During construction of the Proposed Project, various phases of construction would result in the use of different groups of equipment. This would result in the generation of different amounts of emissions during the various construction phases. The air quality analysis presented in this air quality report assessed construction emissions during various phases of construction. The total worst-case daily construction-related emissions associated with the interchange, without mitigation measures, would be approximately 12.92 lbs/day of ROG, 102.57 lbs/day of NO_x and 407.51 lbs/day of PM_{10} (**Appendix E**). ***Construction-related emissions of NO_x and PM_{10} would be anticipated to be a short-term mitigable significant impact.***

Mitigation 5.5-1 Construction Emissions

The following mitigation will assure that the proposed project will result is a ***less than significant impact.***

(A) Water all active construction areas at least twice daily;

(B) Cover all trucks hauling soil, sand, and other loose materials or require all trucks to maintain at least two feet of freeboard (i.e., the minimum required space between the top of the load and the top of the trailer);

(C) Pave, apply water three times daily, or apply (non-toxic) soil stabilizers on all unpaved access roads, parking areas and staging areas at construction sites;

(D) Sweep daily (preferably with water sweepers) all paved access roads, parking areas and staging areas at construction sites; and

(E) Sweep streets daily (preferably with water sweepers) if visible soil material is carried onto adjacent public streets.

(F) Hydroseed or apply (non-toxic) soil stabilizers to inactive construction areas (previously graded areas inactive for ten days or more);

(G) Enclose, cover, water twice daily, or apply (non-toxic) soil stabilizers to exposed stockpiles (dirt, sand, etc.);

(H) Limit traffic speeds on unpaved roads to 15 miles per hour;

(I) Install sandbags or other erosion control measures to prevent silt runoff to public roadways;

(J) Replant vegetation in disturbed areas as quickly as possible;

(K) Designate a person or persons to oversee the implementation of a comprehensive dust control program and to increase watering, as necessary.

(L) To the extent feasible, require the use of construction equipment that meets the new emission standards for diesel engine-powered equipment.

(M) To reduce construction-related NOx emissions, all construction vehicles and equipment shall be properly maintained and operated.

Impact 5.5-2 Asbestos Emissions

AA No action will occur as a result of the No Project/Action Alternative. ***No impact*** will occur under the No Project/Action Alternative.

AB, AC El Dorado County is located in the Sierra Foothills. The geology of the Sierra foothills includes an abundance of serpentine rock. Serpentine rock often contains naturally-occurring asbestos. Asbestos is the name for a group of naturally-occurring silicate minerals. When serpentine rock is broken or crushed, asbestos may be released from the rock and may become airborne, causing a potential health hazard. ***The Proposed Project will result in the disturbance of asbestos-containing rock and soil, which is considered a significant but mitigableimpact.***

Mitigation 5.5-2 Asbestos Emissions

The following mitigation will assure that the proposed project will result is a ***less than significant impact.***

(A) This impact would be reduced to a less-than-significant level by complying with Chapter 8.44 of Title 8 of the El Dorado County Ordinance Code, "Naturally Occurring Asbestos and Dust Protection Ordinance". Section 8.44.030 of this ordinance specifically addresses "General Requirements for Grading, Excavation and Construction Activities".

Section 8.44.030 requires the following:

- An Asbestos Hazard Dust Mitigation Plan.
- Required construction practices, including: wetting work areas, limiting vehicle access, and covering areas with nonasbestos material.

These measures will reduce the potential for asbestos dust from becoming airborne and causing a health hazard.

Impact 5.5-3 General Conformity with the State Implementation Plan

AA No action will occur as a result of the No Project/Action Alternative. ***No impact*** will occur under the No Project/Action Alternative.

AB, AC Under the federal CAA amendments of 1990, federal agencies must make a determination of conformity with the applicable SIP before taking any action on a Proposed Project. The U.S. EPA has established "de minimis" emissions thresholds that are used to determine whether a general conformity determination is required. The applicable de minimis thresholds are 25 tons

per year for VOC emissions, 25 tons per year for NO_x emissions, and 100 tons per year for PM_{10} emissions.

As shown in **Appendix E**, implementation of the Proposed Project would result in 2.02 tons per year of VOC emissions, 16.00 tons per year of NO_x emissions, and 55.98 tons per year of PM_{10} emissions. Since these values are lower than the de minimis thresholds, a general conformity determination is not necessary for the Proposed Project. ***Therefore, the Flyover Interchange Design Alternative and Diamond Interchange Design Alternative are not expected to result in a significant impact to the environment.***

Mitigation 5.5-3 General Conformity with the State Implementation Plan

None Required.

Impact 5.5-4 Transportation Conformity with the State Implementation Plan

AA No action will occur as a result of the No Project/Action Alternative. ***No impact*** will occur under the No Project/Action Alternative.

AB, AC The general approach used in conducting the transportation air quality conformity analysis was to develop forecasts of regional mobile source emission levels, including emissions associated with the Shingle Springs Rancheria project, and compare these emission levels to previously-established thresholds. The thresholds, referred to as “emissions budgets”, were established during development of the Sacramento area’s SIP. The project’s conformity with the SIP is demonstrated when the forecasted emission levels, including the project, are found to be within the emissions budgets.

The approach used in the project-level air quality conformity analysis of the Shingle Springs Rancheria project is the same as the approach used by the SACOG in the regional air quality conformity analysis of Amendment 99-2 to the 1999 MTP and Amendment 01-04 (including Supplement A) to the fiscal year 2000/2001 MTIP.

For the conformity analysis of the Shingle Springs Rancheria project, emission levels were compared to emissions budgets for three types of

pollutants: ROG, NOx, and CO. The comparison was made for three analysis years: 2005, 2015, and 2025.

The technical analysis involved the use of three types of computer simulation models: SACMET, a travel simulation model; EMFAC7F version 1.1, a motor vehicle emission rate model; and DTIM2, a mobile source emissions model. All of these are the latest models approved for use in conducting conformity analyses in the Sacramento area. All of these models use the latest available planning assumptions.

Table 5.5-4 present a summary of the project-level transportation air quality conformity analysis results. For each of the three analysis years, and each of the three types of pollutants, **Table 5.5-4** presents estimates of regional mobile source emissions. The estimates include emissions associated with the Shingle Springs Rancheria project as well as emissions for all other projects included in the latest MTIP and MTP.

Table 5.5-4 also presents the emissions budget for each of the three types of pollutants analyzed for this conformity analysis. For ROG, the emission budget is 31.32 tons per day (tpd). For NOx, the emission budget is 61.35 tpd. For CO, the emission budget is 780 tpd.

As shown in **Table 5.5-4**, the estimates of regional mobile source emissions for each of the three analysis years and each of the three types of pollutants are less than the emissions budget. Since these emission estimates, which include emissions associated with the Shingle Springs Rancheria project, are less than the emissions budgets, the Shingle Springs Rancheria project conforms with the SIP. ***Therefore, the proposed project is not expected to result in a significant impact to the environment.***

Mitigation *5.5-4 Transportation Conformity with the State Implementation Plan*

None Required.

Table 5.5-4. Comparison of Forecasted Emissions and Emissions Budgets

Emissions Category	Analysis Year 2005	2015	2025
Reactive Organic Gases			
Forecasted Emissions	29.00	17.53	18.49
Emissions Budget	31.32	31.32	31.32
Pass Conformity Test?	Yes	Yes	Yes
Nitrogen Oxide Emissions			
Forecasted Emissions	56.82	43.54	48.77
Emissions Budget	61.35	61.35	61.35
Pass Conformity Test?	Yes	Yes	Yes
Carbon Monoxide Emissions			
Forecasted Emissions	248.77	217.91	244.22
Emissions Budget	780	780	780
Pass Conformity Test?	Yes	Yes	Yes

Source: CCS, 2002.

Impact 5.5-5 Carbon Monoxide Emissions

AA No action will occur as a result of the No Project/Action Alternative. ***No impact*** will occur under the No Project/Action Alternative.

AB, AC Ambient CO concentrations associated with AB and AC are the sum of background CO levels and the project contribution from vehicular emissions. Background CO is attributable to a variety of emission sources that exist locally, outside of the highway network being specifically modeled in the microscale analysis.

The estimation of project-related CO concentrations is based on three major categories of data:

- an estimate of the number of vehicles (peak hour traffic volumes),
- emission factors (the rate of CO emitted by vehicles), and
- dispersion patterns (how the CO from vehicles disperses).

The analysis of CO concentrations conducted for this air quality analysis was conducted according methods described in the following documents:

- *Transportation Project-Level Carbon Monoxide Protocol* (Institute of Transportation Studies, University of California, Davis 1996); and

- Air Quality Technical Analysis Notes (California Department of Transportation 1988).

The air quality microscale dispersion model used for this air quality analysis, CAL1NE4, is a line source model developed by Caltrans (California Department of Transportation 1989). It is based on the Gaussian diffusion equation and employs a mixing zone concept to characterize pollutant dispersion over the roadway. Given source strength, meteorology, and site geometry, CALINE4 can predict pollutant concentrations for receptors located within 500 meters (1,500 feet) of the roadway.

The CALINE4 model was used to estimate one-hour average CO concentrations at receptor locations. A persistence factor of 0.7 was applied to the one-hour average values to estimate eight-hour average values (Institute of Transportation Studies, University of California, Davis 1996).

Location Analyzed

The CO analysis conducted for this air quality analysis focused on the proposed new interchange. This location was selected for analysis because the interchange area would be exposed to CO contributions from both the relatively high traffic volumes along U.S. 50 and the new project-related travel along the interchange ramps.

Background Carbon Monoxide Levels

Background CO concentrations used in the analysis were based on the closest locally-measured monitoring values. As recommended in *Air Quality Technical Analysis Notes* (California Department of Transportation 1988), the second highest annual maximum one-hour average concentration during a

three year period was used as the background value. The second highest annual maximum one-hour average value of 2.0 ppm, measured at the Gold Nugget Way station in Placerville, was used in this air quality report.

Traffic Data

The CALINE4 modeling analysis used peak hour traffic data from the traffic analysis conducted for the Proposed Project. The traffic data included peak hour volumes, intersection geometrics, and intersection operational characteristics. Traffic data for Existing Plus Project Condition and 2025 Cumulative Plus Project Conditions were used.

Emission Factors

On-road motor vehicle emission rates, usually expressed in grams per vehicle mile, were used in the analysis of CO concentrations. The estimate of motor vehicle emission rates takes into account the combined effects of vehicle operating mode, types of vehicles, temperature, vehicle speed, year, and altitude. Motor vehicle emission rates used for this report were generated from the CARB emission factor model EMFAC7F (Version 1.1). Emission rates used in the analysis were based on the following data:

- The project location is under 1,219 meters (4,000 feet) elevation,
- The adjusted January mean minimum temperature is 40°F,
- The project location has a motor vehicle inspection and maintenance program,
- The traffic mix listed in **Appendix F**.

The output files for EMFAC7F (Version 1.1) are included in **Appendix E**.

The motor vehicle fleet mix used are from the *Transportation Project-Level Carbon Monoxide Protocol* document. Recent changes in the vehicle purchasing behavior has resulted in an increase in the relative portion of the vehicle fleet made up of sport utility vehicles (SUVs). At the time this air quality study was prepared, air quality planning agencies in the Sacramento area were considering changes to the planning assumptions for motor vehicle fleet mix to reflect the relative increase in SUVs. However, the agencies have not reached agreement on the revised values and these values are, therefore,

not available for use in air quality analysis. Use of the revised values with a relatively larger portion of SUVs would likely result in slightly higher CO concentrations. However, the qualitative conclusions of the CO analysis would not change.

Emission rates for 2000 were used in the analysis of Existing Conditions. Year 2025 Cumulative Plus Project traffic conditions were also analyzed. However, EMFAC7F (Version 1.1) does not estimate emission rates for years after 2020. Therefore, emission rates for 2020 were used in the analysis of 2025 conditions. Since the fleet average emission rate decreases over time, use of 2020 emission rates conservatively over-estimates 2025 concentrations.

Receptor Locations

The CALINE4 model estimates CO concentrations at specific locations. These locations are referred to as “receptors” and represent specific locations in the study area. Because of the low density of development in the vicinity of the project site, there is a lack of identifiable actual receptors. Four hypothetical receptors were located at the edge of the U.S. 50 right-of-way,

- Northeast of the proposed new interchange,
- West of the interchange,
- South of the interchange, and
- East of the interchange.

In addition, 16 receptors were located on existing structures nearest to the proposed location of the interchange.

Findings

A summary of the results of the CALINE4 CO analysis is presented in **Table 5.5-5**. Estimated CO concentrations at each of the receptor locations are presented.

The summary shows the analysis results for Existing Plus Project Conditions, and 2025 Cumulative Plus Project Conditions. For each condition, both 1-hour average and 8-hour average CO concentrations are presented.

Table 5.5-5 Carbon Monoxide Concentrations at the Shingle Springs Rancheria Interchange on U.S. 50

Receptor	Flyover Interchange				Diamond Interchange			
	Existing Conditions		2025 Plus Project Conditions		Existing Conditions		2025 Plus Project Conditions	
	One Hour Average	Eight Hour Average	One Hour Average	Eight Hour Average	One Hour Average	Eight Hour Average	One Hour Average	Eight Hour Average
Northeast of the Interchange	2.9	2.0	2.4	1.7	3.0	2.1	2.5	1.8
West of the Interchange	2.7	1.9	2.4	1.7	2.8	2.0	2.4	1.7
South of the Interchange	2.8	2.0	2.4	1.7	2.9	2.0	2.4	1.7
East of the Interchange	2.7	1.9	2.4	1.7	2.8	2.0	2.4	1.7
450 Meters Southeast of Artesia/ Access	2.4	1.7	2.2	1.5	2.5	1.8	2.3	1.6
East of “tee” and 135 Meters East of U.S. Centerline	2.5	1.8	2.2	1.5	2.6	1.8	2.3	1.6
South of US 50 and West of Hope Lane	2.6	1.8	2.3	1.6	2.7	1.9	2.3	1.6
Southeast of Existing Casino	3.0	2.1	2.5	1.8	2.9	2.0	2.5	1.8
Southwest of Existing Casino	2.8	2.0	2.4	1.7	2.9	2.0	2.5	1.8
Northwest of the Interchange and 90 Meters North of US 50 Centerline	2.6	1.8	2.3	1.6	2.7	1.9	2.3	1.6
North of US 50 and East of Pinnacle Ct.	2.4	1.7	2.2	1.5	2.4	1.7	2.2	1.5
Northwest of the Interchange and 120 Meters North of US 50 Centerline	2.5	1.8	2.2	1.5	2.6	1.8	2.3	1.6
South of “tee” and 100 Meters South of U.S. Centerline	2.5	1.8	2.3	1.6	2.7	1.9	2.3	1.6
West of the Interchange and 100 Meters North of US 50 Centerline	2.6	1.8	2.3	1.6	2.7	1.9	2.4	1.7
East of the Interchange and 100 Meters South of US 50 Centerline	2.5	1.8	2.3	1.6	2.6	1.8	2.3	1.6
Northeast of the Interchange and 100 Meters North of US 50 Centerline	2.6	1.8	2.3	1.6	2.7	1.9	2.4	1.7
South of the Interchange and 125 Meters South of US 50 Centerline	2.5	1.8	2.2	1.5	2.6	1.8	2.3	1.6
South of the Interchange and 180 Meters South of US 50 Centerline	2.4	1.7	2.2	1.5	2.5	1.8	2.2	1.5
Northwest on the Interchange and 150 Meters North of US 50 Centerline	2.5	1.8	2.3	1.6	2.6	1.8	2.3	1.6
Northeast of the Interchange and 150 Meters South of US 50 Centerline	2.6	1.8	2.3	1.6	2.7	1.9	2.3	1.6

Source: CALINE4 microscale air quality dispersion model.
Note: All values are in parts per million of Carbon Monoxide. State one-hour standard for Carbon Monoxide is 20 parts per million. State eight-hour standard for Carbon Monoxide is 9 parts per million.

Since CO concentrations under both Existing Plus Project Conditions and 2025 Cumulative Plus Project Conditions are lower than the CO air quality standards, the impact is considered ***less than significant***. The CAL1NE4 output files are included in **Appendix E.**

Mitigation 5.5-5 Carbon Monoxide Emissions

None Required.

Impact 5.5-6 Cumulative Carbon Monoxide Impacts

AA The No Project/Action Alternative will not contribute to cumulative air quality impacts. ***No impact*** will result from the No Project/Action Alternative.

AB, AC As shown in Table 5.5-5, under Existing Plus Project Conditions, the highest 1-hour average CO concentration is 3.0 ppm and the highest 8-hour average CO concentration is 2.1 ppm. These concentrations are estimated to occur southeast of the existing casino site. The state 1-hour average CO standard is 20 ppm. The state and federal 8-hour average CO standard is 9 ppm. Both the 1-hour value and the 8-hour value under Existing Plus Project Conditions are below the CO air quality standard.

Under 2025 Cumulative Plus Project Conditions, the highest 1-hour average CO concentration is 2.5 ppm and the highest 8-hour average CO concentration is 1.8 ppm. These concentrations are estimated to occur southeast of the existing casino site. The state 1-hour average CO standard is 20 ppm. The state and federal 8-hour average CO standard is 9 ppm. Both the 1-hour value and the 8-hour value under 2025 Cumulative Plus Project Conditions are below the CO air quality standard. ***Therefore, the Flyover Interchange Design Alternative and Diamond Interchange Design Alternative are not expected to result in a significant impact to the environment.***

Mitigation 5.5-6 Cumulative Carbon Monoxide Impacts

None Required.

5.6 Noise And Vibration

5.6.1 Introduction

The Noise and Vibration section of the EIR/EA analyzes the potential short-term, long-term, and cumulative impacts resulting from the construction and operation of the Project and alternatives. The noise and vibration discussion will analyze the noise and vibration conditions in the proposed Shingle Springs Interchange project area.

5.6.2 Environmental Setting

The existing noise environment is dominated by traffic on Highway 50. Ambient noise measurements were performed at four locations on both sides of the highway in early November 2000, at the locations shown by **Figure 5.6-1**. The noise measurement results are summarized in **Table 5.6-1**.

Sound measurement equipment consisted of Larson Davis Laboratories (LDL) Model 820 precision integrating sound level meters, which were equipped with B&K Type 4176 ½" microphones. The measurement equipment was calibrated immediately before and after use, and meets the pertinent specifications of the American National Standards Institute (ANSI) and the International Electrotechnical Institute (IEC) for Type 1 precision sound measurement systems.

Noise measurements were conducted in terms of the L_{eq} and other statistical descriptors. The noise level measurements were used to determine statistical trends in traffic noise levels throughout the day and nighttime periods, and to determine the peak hour traffic noise level and when the peak hour traffic noise level occurred. The measured peak hour traffic noise levels were later compared to values predicted by the Sound-32 model based upon existing conditions.

The data below shows that noise from traffic on Highway 50 is dominant at all of the monitoring locations.

The measured noise levels at Site 2 reasonably describe ambient noise levels in areas shielded from view of the highway. The measured noise levels at Sites 1, 3 and 4 reasonably describe the range of ambient noise levels at receiver locations that are *not* shielded from view of Highway 50.

See Figure 5.6-1

Table 5.6-1 Measured Noise Levels Shingle Springs Rancheria Area

Site	Date	L_{dn}, dB	Hourly L_{eq}, dBA		
			Peak Hour	Daytime Average	Nighttime Average
1	Nov. 1-2, 2000	67.7	66.9	65.2	60.1
1	Nov. 2-3, 2000	68.1	66.8	65.5	60.5
2	Nov. 1-2, 2000	51.3	51.2	45.1	44.9
2	Nov. 2-3, 2000	51.1	49.8	46.6	44.3
3	Nov. 1-2, 2000	62.5	61.2	58.5	55.5
3	Nov. 2-3, 2000	63.0	62.1	59.0	56.1
4	Nov. 1-2, 2000	65.1	63.5	62.0	57.7
4	Nov. 2-3, 2000	65.8	64.5	62.2	58.7

Source: BBA, 2001

As a sensitivity analysis, traffic noise levels for existing conditions were estimated for the generalized project area using the Federal Highway Administration (FHWA) Highway Traffic Noise Prediction Model (FHWA RD-77-108). The FHWA model results are depicted in **Table 5.6-2**. According to this analysis, the noise impact threshold value of 65 dBA L_{eq} would be expected at receivers about 415 feet from the highway centerline during weekday peak hour traffic conditions, and at a distance of about 349 feet from the highway centerline during Saturday peak hour conditions. These values are conservative in that the analysis presumes that there is no significant attenuation of traffic noise by the site topography.

Table 5.6-2 Existing (Model Predicted)Traffic Noise Levels Highway 50: Existing Conditions

Condition	Peak Hour L_{eq}, dBA at 50 feet	Distance to 65 dBA L_{eq} Contour, feet
Weekday Peak Hour	79	415
Saturday Peak Hour	78	349

Source: BBA, 2001

To describe projected noise levels due to traffic at specific receiver locations, the Sound-32 traffic noise prediction model was used. The Sound 32 Model was developed to predict hourly L_{eq} values for free-flowing traffic conditions, and is considered to be accurate within 1.5 dB. The Sound-32 Model is the Caltrans coded version of the Federal Highway

Administration (FHWA) Traffic Noise Prediction Model. Sound-32 is the Caltrans version of the Stamina program, and reports noise levels in terms of the hourly L_{eq} for comparison to the Caltrans Noise Abatement Criteria.

Traffic noise levels were calculated at 10 receiver locations. Traffic data for the analysis were provided by the project traffic consultant. Free flow travel speeds were assumed. For the initial analysis, no accounting was made of potential topographic shielding. The predicted existing peak hour traffic noise level is about 2 dBA higher at Receiver 3 than the noise levels measured there November 1-3, 2000. At Receiver 10, the predicted peak hour traffic noise level is very close to the values measured there November 1-3, 2000.

Given that the site topography is complex relative to the roadway, and based upon field observations that the topography provided significant shielding of traffic noise at several receivers, the noise analysis was supplemented with an analysis of the shielding provided by the topography at the Highway 50 right of way. This was accomplished by inserting a barrier in the sound path from Highway 50 to the receivers, assuming that the right of way elevation was the top of a barrier. **Table 5.6-3** provides the results of the traffic noise modeling with and without consideration of the right of way topographic shielding, using a drop-off rate of –4.5 dB/doubling.

Table 5.6-3 Predicted Traffic Noise Levels At Selected Receiver Locations Existing Conditions

Site Number	Description	Predicted Peak Hour L_{eq}, dBA	
		Without Topography	With Topography
f1	Residence	64	59
2	Residence	57	57
3	Monitoring Site 2	53	52
4	Residence	52	52
5	Residence	58	58
6	Residence	62	62
7	Residence	63	63
8	Residence	67	60
9	Residence	62	61
10	Monitoring Site 4	64	63

Source: BBA, 2001

The predicted noise levels in **Table 5.6-3**, assuming topographic shielding, may be considered reasonable representations of existing Highway 50 traffic noise at the receivers in the project area

5.6.3 Regulatory Setting

The criteria for evaluating noise impacts that are used by the Federal Highway Administration and Caltrans are contained in the October 1998 Caltrans Traffic Noise Analysis Protocol (The Protocol). According to the Protocol, under NEPA, impacts and measures to mitigate adverse impacts must be identified, including then identification of impacts for which no or only partial mitigation is possible. The FHWA regulations (23 CFR 772) constitute the Federal Noise Standard. These regulations state that noise abatement must be considered for Type 1 projects when the project results in a substantial noise increase, or when the predicted noise levels approach or exceed the Noise Abatement Criteria. Noise abatement measures which are reasonable and feasible and that are likely to be incorporated into the project, as well as noise impacts for which no apparent solution is available, must be identified and incorporated into the project's plans and specifications.

According to the Protocol, the Noise Impact Analysis must include the following elements: identification of land uses which may be affected by noise from the roadway, determination of the highest existing hourly noise levels, prediction of worst case hourly traffic noise levels using an accepted noise prediction methodology, and determination of traffic noise impacts for areas adjoining the project.

The unit of noise (sound) level measurement employed in this report is the A-weighted sound pressure level, denoted in decibels (dBA). The noise impact criteria are expressed in terms of the equivalent, or energy-average, hourly noise level, L_{eq}(h), in dBA.

The Noise Abatement Criteria for various land uses are categorized on the basis of their sensitivity to noise. **Table 5.6-4** lists the Noise Abatement Criteria.

The Category B noise abatement criterion applies to residences, hotels, motels, churches, schools, recreation areas, active sport areas and parks, and is an hourly exterior sound level of 67 dBA, L_{eq}(h). The Category E criterion also applies to residences, motels, hotels, schools, hospitals, and similar uses, and is an hourly interior sound level of 52 dBA L_{eq}(h). The interior sound level criterion only applies in those situations where there are no exterior activities that are affected by the traffic noise.

Table 5.6-4 Activity Categories and Noise Abatement Criteria

Activity Category	NAC, Hourly A-Weighted Noise Level, dBA L_{eq}(h)	Description of Activities
A	57 Exterior	Lands on which serenity and quiet are of extraordinary significance and serve an important public need and where the preservation of those qualities is essential if the area is to continue to serve its intended purpose.
B	67 Exterior	Picnic areas, recreation areas, playgrounds, active sports areas, parks, residences, motels, hotels, schools, churches, libraries, and hospitals.
C	72 Exterior	Developed lands, properties or activities not included in Categories A or B above.
D	--	Undeveloped lands.
E	52 Interior	Residences, motels, hotels, public meeting rooms, schools, churches, libraries, hospitals, and auditoriums.

Source: Caltrans Traffic Noise Analysis Protocol, 1998

5.6.4 Impacts And Mitigation Measures

Significance Criteria

According to the Protocol, a traffic noise impact will occur if a noise increase is substantial, which occurs when the predicted noise levels with the project exceed existing noise levels by 12 dBA, Leq(h).

A noise impact resulting from a substantial noise increase may additionally be a significant adverse environmental effect. To determine if the substantial noise increase is a significant adverse environmental effect, consideration must be given to the context and intensity of the substantial noise increase. Context refers to the project setting and uniqueness, or sensitive nature of the noise receivers. Intensity refers to the increase in noise levels over the “no build” condition, to the number of residential units affected, and to the absolute noise levels.

The Protocol further states that a traffic noise impact will also occur when predicted noise levels with the project approach within 1 dBA, or exceed, the Noise Abatement Criteria (NAC).

The Protocol also states that a *traffic noise impact* may occur if, as a result of a proposed freeway project, noise levels exceed 52 dBA L_{eq}(h) within the interior of an existing public or private elementary or secondary school (Pursuant to Calif. Streets and Highways Code, Section 216).

For this analysis, it was assumed that a predicted traffic noise level of 65 dBA L_{eq} or more would approach or exceed the NAC at a residential receiver.

Methodology

Exterior Traffic Noise

The Sound-32 traffic noise prediction model was used to predict peak hour traffic noise levels at the selected receiver locations. In these cases, the - 4.5 dBA doubling rate was used only for Highway 50 traffic, as no noise measurement results can be applied to the ramp traffic. The results of these predictions are shown by **Table 5.6-5**. These predictions include the insertion loss (shielding) provided by the topography at the Highway 50 right of way.

At the nearest homes, which are represented by all of the above receivers except numbers 3 and 10, the predicted future peak hour traffic noise levels due to the project range from 55 dBA to 66 dBA. At receivers 1 through 5, 8, and 9, the predicted noise levels due to the project are below the threshold for a *traffic noise impact* as defined by the NAC.

The predicted future traffic noise levels at the above locations are 2 dBA to 4 dBA higher than the peak hour traffic noise levels at present. This increase in noise levels is less than the 12 dBA threshold for a substantial increase.

At receivers 6, 7, and 10, the predicted future cumulative traffic noise levels are at or above the NAC. The predicted changes in traffic noise levels at those locations due to the project are 1 dBA or less as compared to future No Project/Action conditions, which is less than the 12 dBA threshold for a substantial increase.

The total traffic noise exposure would be comprised of noise from traffic on both Highway 50 and the ramps. It is useful to consider the change in noise exposure expected from ramp traffic alone. Traffic noise levels were predicted which would be associated with only the on- and off-ramp traffic for the project. **Table 5.6-6** lists the predicted peak hour traffic noise levels for that analysis.

At the nearest homes, represented by sites 1, 2, and 4 through 9, the predicted future peak hour ramp traffic noise levels range from 53 dBA to 59 dBA. The predicted noise levels are below the threshold for significance as defined by the NAC.

In addition, the predicted future ramp traffic noise levels at Receivers 3 and 10 are about the same as the existing peak hour traffic noise levels, as demonstrated by the ambient noise measurements. The future Highway 50 traffic noise level will increase by 1 to 2 dBA in the No Project/Action condition. If the noise from the ramp traffic were to be added to the future (No Project/Action) noise level, the total noise levels at the sensitive receivers change by 2 dBA or less. This increase in noise levels is less than the 12 dBA threshold for a substantial change.

Table 5.6-5 Predicted Peak Hour Traffic Noise Levels At Selected Receiver Locations

Receiver	Peak Hour L_{eq}, dBA			
	Existing	Future No Project/Action	Flyover Interchange	Diamond Interchange
1	59	61	61	61
2	57	59	61	62
3	52	54	55	56
4	52	54	55	56
5	58	60	61	61
6	62	64	65	65
7	63	65	66	66
8	60	62	62	62
9	61	63	63	63
10	63	65	65	65

Source: BBA, 2001

Interior Traffic Noise

Typical facade construction in accordance with the UBC will provide an exterior to interior traffic noise reduction of 20 dBA to 25 dBA. It is usually assumed that all residences which are exposed to exterior noise levels of 67 dBA L_{eq} or less will comply with the Caltrans interior noise level criterion of 52 dBA L_{eq}. Based upon this analysis, none of the nearest residences will be exposed to exterior noise levels in excess of 67 dB L_{eq}. Therefore, interior noise levels at these locations are expected to comply with the Caltrans 52dBA L_{eq} interior noise level criterion.

Construction Equipment Noise

According to the Protocol, construction noise is only substantial in exceptional cases, such as pile driving and certain pavement rehabilitation operations. If construction noise on any highway project is anticipated to be a substantial problem, Standard Specifications Sections 7

and 42, and Standard Special Provisions provide limits on construction noise levels, and are used as appropriate.

Table 5.6-6 Predicted Project Traffic Noise Levels At Selected Receiver Locations Ramp Traffic Only

Site Number	Description	Predicted Peak Hour L_{eq}, dBA
1	Residence	58
2	Residence	58
3	Noise Monitoring Site 2	51
4	Residence	51
5	Residence	56
6	Residence	59
7	Residence	57
8	Residence	56
9	Residence	53
10	Noise Monitoring Site 4	56

Source: BBA, 2001

Impact/Mitigation

Impact 5.6-1 Traffic Noise Impact (Existing and Cumulative)

AA The No Project/Action Alternative would not result in construction activities or future commercial development of the Rancheria. ***No impact*** will result from the No Project/Action Alternative.

AB, AC At receivers 6 and 7, the predicted future cumulative traffic noise levels for AB and AC exceeds the NAC. The predicted changes in traffic noise levels at those locations due to the project are about 1 dBA as compared to future No Project/Action conditions, which is less than the 12 dBA threshold for a substantial increase. Under The Protocol, if a traffic noise impact is predicted, noise abatement measures must be evaluated and considered. If a traffic noise impact is not found to be a significant adverse environmental impact, the project sponsor must identify and implement all reasonable and feasible noise abatement measures. These noise abatement measures are considered project features, rather than mitigation. ***Therefore, the Flyover Interchange Design***

Alternative and the Diamond Interchange Design Alternative are not expected to result in a significant noise impact to the environment.

Mitigation 5.6-1 Traffic Noise Impact (Existing and Cumulative)

No mitigation is required. However, the Caltrans Protocol requires an analysis of potential noise abatement measures. The analysis revealed that it would not be feasible to provide noise barriers along the Highway 50 right of way for receivers 6 and 7. Therefore no barrier is required.

Impact 5.6-2 Construction Equipment Noise

AA The No Project/Action Alternative would not result in construction activities or future commercial development of the Rancheria. ***No impact*** will result for the No Project/Action Alternative.

AB, AC During the construction phase of the project, noise from construction activities would dominate the noise environment in the immediate area. Activities involved in construction would generate noise levels, as indicated in **Table 5.6-7** ranging from 70 to 90 dB at a distance of 50 feet. Construction activities would be temporary in nature, typically occurring during normal working hours. Construction noise impacts could be significant, as nighttime operations or use of unusually noisy equipment could result in annoyance or sleep disruption for nearby residences.

Construction noise is regulated by Caltrans standard specifications Section 7-1.01I "Sound Control Requirements". These requirements state that noise levels generated during construction shall comply with applicable local, state and federal regulations, and that all equipment shall be fitted with adequate mufflers according to the manufacturers' specifications.

During construction, noise generated by approaching traffic would be reduced due to a reduction in speed required by working road crews. Conversely, traffic noise levels of vehicles leaving the construction area would be slightly higher than normal due to acceleration. The net effect of the accelerating and decelerating traffic upon noise would not be appreciable. The most important project-generated noise source would be truck traffic associated with transport of heavy materials and equipment. This noise increase would be of short duration and limited primarily to daytime hours, but such noise impacts could be significant.

Table 5.6-7 Construction Equipment Noise Levels

Type of Equipment	Maximum Sound Level, dB, at 50 feet
Scrapers	88
Bulldozers	87
Heavy Trucks	88
Backhoe	85
Pneumatic Tools	85

Source: Environmental Noise Pollution, Patrick R. Cunniff, 1977

According to the Protocol, construction noise is only substantial in exceptional cases, such as pile driving and certain pavement rehabilitation operations. If construction noise on any highway project is anticipated to be a substantial problem, Standard Specifications Sections 7 and 42, and Standard Special Provisions provide limits on construction noise levels, and are used as appropriate. No substantial construction noise is anticipated for this project.

Noise levels resulting from potential blasting during construction are also a concern. Preliminary engineering work conducted for the project indicates that some of the exposed rock in the cutbank at the top of the ridge will need to be presplit prior to excavation (north and south of the Highway). Presplitting is defined as the establishment of a free surface or shear plane in rock along the specified excavation slope by the controlled use of explosives and blasting accessories in appropriately aligned and spaced drill holes. The specific type and location of blasting that may be required for this project have not been determined, and the noise levels from blasting activities are affected by many variables, which include the size of the explosive charge, relative timing of individual detonations, the amount of overburden that is covering the charges, and the time of day or night when the blast occurs. El Dorado County does not have noise-level criteria for evaluating noise impacts associated with blasting activities; however, blasting activities may disturb nearby residents ***This is considered to be a potentially significant impact***.

Mitigation 5.6-2 Construction Equipment Noise

The following mitigation will assure that the proposed project will result is a ***less than significant impact***.

General

(A) Construction noise can be mitigated to less than significant levels by requiring compliance with Caltrans standard specifications Section 7-1.01I "Sound Control Requirements." These requirements state that noise levels generated during construction shall comply with applicable local, state and federal regulations, and that all equipment shall be fitted with adequate mufflers according to the manufacturers' specifications.

Rock Prespliting

(B) Blasting will be performed in accordance with Caltrans' "Standard Specifications" including Sections 7-1.10 and 19-2.03). The specifications and special provisions developed for blasting will address safety issues and avoidance of damage to existing pavement, utilities, subdrains, structures, and other natural and human-made features.

(C) Blasting will comply with the following recommendations:

(1) A qualified blasting contractor will be retained to determine the size, type, and location of blasting so as to minimize disturbance to nearby residents, and to ensure that no property damage will result from blast noise and vibration.

(2) Blasting will be conducted to minimize impacts on the traveling public. If possible, blasting will be conducted during non-peak, midmorning hours on Tuesdays, Wednesdays, or Thursdays. Blasting will be avoided during morning or afternoon peak-hour traffic conditions, and from noon on Friday to noon on Monday.

(3) The blasting contractor will be responsible for all traffic control during blasting, including stopping traffic in both directions, minimizing flyrock during the blasting, and cleaning up any blast debris.

(4) Changeable message signs will be used to notify the traveling public of traffic delays during blasting events.

5.7 Biological Resources

5.7.1 Introduction

The Biological Resources section of the EIR analyzes the potential short-term, long-term, and cumulative impacts resulting from the construction and operation of the Project and alternatives. The Biological Resources discussion will assess the Biological Resources in the proposed Shingle Springs Interchange area.

5.7.2 Environmental Setting

Vegetation

Vegetative communities are assemblages of plant species that occur together in the same area. They are defined by species composition and relative abundance. The vegetative community descriptions and nomenclature generally follows the classification system provided in Sawyer and Keeler-Wolf's *A Manual of California Vegetation* (1995). The vegetative communities described below generally correlate with wildlife habitat types. The wildlife habitats identified in this section were described using California Department of Fish and Game's (CDFG's) *A Guide to Wildlife Habitats* (Mayer and Laudenslayer, 1988).

Mixed Oak Series

The primary plant community associated with the project site consists of mixed oak woodland. Structurally, most of the woodland on the project site is two-tiered, being composed of a dense overstory of interior live oak (*Quercus wislizenii*) and blue oak (*Q. douglasii*) and a well-developed understory of various shrub species. Other dominate tree species that occur on the project site include valley oak (*Q. lobata*), black oak (*Q. kelloggii*), California buckeye (*Aesculus californica*), foothill pine (*Pinus sabiniana*), and ponderosa pine (*Pinus ponderosa*). The shrub understory is primarily composed of toyon (*Heteromeles arbutifolia*), California coffeeberry (*Rhamnus californica*), whiteleaf manzanita (*Arctostaphylos viscida*), coyotebrush (*Baccharis pilularis* var. *sanguinea*), buckbrush (*Ceanothus cuneatus*), and poison oak (*Toxicodendron diversilobum*). Common native and non-native grasses within this community include blue wildrye (*Elymus glaucus*), timothy grass (*Phleum pratense*), medusahead (*Tainenantherum medusae*), and vulpia (*Vulpia macrostachys*). Intermixed within these species are several native and non-native forbs including bedstraw (*Galium nuttallii*), curly dock (*Rumex crispus*), fairy lanterns (*Calochortus alba*), mule ears (*Wyethia* spp.), and soaproot (*Chlorogalum pomeridianum*). Riparian areas contain Fremont's cottonwood (*Populus fremontii fremontii*) and two species of willow, narrow-leaved willow (*Salix exigua*) and pacific willow (*S. lucida*).

Mixed Willow Series

This plant community is associated with the topographic depressions and banks of the intermittent drainages within Proposed Project site, and occurs in only two locations. The mixed oak habitat is interspersed with riparian species including narrow-leaved willow, pacific willow, and black walnut (*Juglans californica*), with an understory dominated by Himilayan blackberry (*Rubus discolor*). This riparian habitat occurs in areas that accumulate wet weather flow from the intermittent drainages.

California Annual Grassland Series

California annual grasslands are interspersed throughout the project site, especially on the drier portions of the site. This series corresponds to the annual grassland wildlife habitat type. Dominant species within this community include ripgut brome (*Bromus diandrus*), yellow star thistle (*Centaurea solstitalis*), paintbrush (*Castilleja* spp.), quaking grass (*Briza maxima*), and blue wildrye (*Elymus glaucus*).

Mixed Chaparral Series

This plant community is a structurally homogenous brushland type dominated by shrubs with thick, stiff, heavily cutinized evergreen leaves. Mixed chaparral is typically a dense, nearly impenetrable thicket with greater than 80% absolute shrub cover. Within the project site, patches of this habitat occur along Highway 50 near the barren road-cut areas. A few other patches are interspersed within the oak woodland habitat. Species occurring within the chaparral community around the Proposed Project location include buckbrush (*Ceonothus cuneatus*), toyon (*Heteromeles arbutifolia*), and whiteleaf manzanita (*Arctostaphylos viscida*).

Wetlands and Waters of the U.S.

Regulated wetlands and other waters of the United States are subject to jurisdiction under Section 404 of the Clean Water Act. No seasonal wetlands occur on the interchange project site. However, several intermittent features were identified, which qualify as waters of the U.S., and are shown in **Figure 5.7-1**. The precise contours of Federal jurisdiction over waters found on the project site are still being settled subsequent to the 2001 Supreme Court decision invalidating earlier agency regulations.

The project site was surveyed for potentially jurisdictional features during a field survey on December 27, 2001. A formal wetland delineation was performed at this time using parameters suggested in the 1987 ACOE Manual (ACOE, 1987). The 1987 ACOE Manual employs the three-parameter approach to wetland delineation; that is, hydrophytic vegetation, hydric soils,

See Figure 5.7-1

and wetland hydrology must all be present for an area to be classified as a jurisdictional wetland. The limit of the "waters of the U.S." for the Proposed Project was determined through field mapping the course of channel features, and obtaining an average width of each feature, based on indicators such as vegetation limits, the location of sediment deposits, and watermarks. Regulated wetlands and other waters of the United States are subject to jurisdiction under Section 404 of the Clean Water Act. Based on the survey, no wetlands were identified, but several intermittent drainages were found to exist within the analysis area. **Table 5.7-1** provides a summary of the "waters of the U.S." features in the project site, including acres within the analysis area. The majority of the intermittent streams identified in the analysis area could potentially be indirectly affected by construction. Approximately 0.09 acres (0.036 hectares) of jurisdictional waters would be directly impacted by the Proposed Project.

Table 5.7-1 Potentially Impacted Jurisdictional Waters Within the Analysis Area

Wetland Type	Total Acreage (Hectares)	Direct Impact	Temporary Impact
Other Waters of the U.S. (Intermittent Drainage)	0.033 (0.013)	0.003 (0.001)	0.030 (0.012)
Other Waters of the U.S. (Intermittent Pond)	0.052 (0.021)	0.052 (0.021)	-
Other Waters of the U.S. (Drainage Ditch)	0.005 (0.002)	0.002 (0.001)	0.003 (0.001)
Total	**0.090 (0.036)**	**0.057 (0.023)**	**0.033 (0.013)**

Source: AES, 2001; ECORP, 2001.

Waters of the U.S.

Intermittent drainages occur on the project site which meet the requirements of jurisdictional waters (i.e., have a defined channel and ordinary high water mark). These features exhibit scoured banks in some areas, with the majority of the channels located within annual grassland habitat. A small section of drainage along the south side of U.S. Highway 50 contains riparian/mixed oak woodland habitat within areas of topographic depression and stormwater accumulation. Vegetation within this riparian area includes narrow-leaved willow, pacific willow, Himalayan blackberry, blue oak, and interior liveoak. A intermittent drainage with discontinuous bed and bank, flows through the center of the 5± acre parcel and drains into an intermittent feature that once served as a stock pond. The stock pond only holds significant amounts of water after heavy rain, and consists of an earthen dam and overflow ditch for high-water events. The ditch directs water towards an intermittent drainage, which is flows parallel to Highway 50 and does not exhibit riparian vegetation or an ordinary high water mark. During or after wet weather events, this drainage flows through a culvert to the south side of Highway 50, where it joins another intermittent drainage. This southern drainage flows parallel to Highway

50, just outside the project's southeastern boundary, and eventually drains into a pond. The pond is semi-permanently flooded, and most likely functions as a stock pond. During high water events this stock pond overflows into Slate Creek, a perennial stream located approximately 450 feet (137.2 meters) east of the Proposed Project site.

Slate Creek Aquatic System

Slate Creek is a perennial stream that originates near the town of El Dorado, southeast of the Rancheria. Slate Creek flows under Highway 50 in an easterly direction and turns to the north flowing through the adjoining parcels east of the existing Rancheria, and approximately 450 feet (137.2 meters) east of the project site (**Figure 5.7-1**). The banks of Slate Creek are incised due to scouring action of stream flow. The streambed is rocky and contains woody debris. Measuring bank to bank, the average width of Slate Creek is approximately 50 feet (15.2 meters). The channel is typically perennial, with the largest water flows being present primarily from November through May. The banks of the channel are defined by a sharp rise in elevation, with a predominance of boulders. The depth of Slate Creek varies from as shallow as 0.5 feet (0.15 meter) in areas containing riffles to as deep as six feet (1.8 meters) in larger pools, with an average depth of two feet (0.6 meter).

Upland vegetation associated with the banks of Slate Creek is comprised of mixed oak woodland, which includes interior live oak, California buckeye, foothill pine, Himalayan blackberry, poison oak, and toyon.

Wildlife Habitats

Oak Woodlands / Chaparral

Oak woodlands are important wildlife habitats that provide abundant cover, foraging, nesting, and resting opportunities. Species common to this habitat include acorn woodpecker (*Melanerpes formicivorus*), oak titmouse (*Parus inornatus*), bushtit (*Psaltriparus minimus*), white-breasted nuthatch (*Sitta carolinensis*), California scrub jay (*Aphelocoma californica*), western gray squirrel (*Sciurus griseus*), dusky-footed woodrat (*Neotoma fuscipes*), striped skunk (*Mephitis mephitis*), and black-tailed deer (*Odocoileus hemionus californicus*). Black-tailed deer use the woodland to forage and rest, and as a movement corridor to access other habitat types. Red-shouldered hawk (*Buteo lineatus*), red-tailed hawk (*Buteo jamaicensis*), Cooper's hawk (*Accipiter cooperii*), and great horned owl (*Bubo virginianus*) may nest within this community and forage within it or adjacent grasslands. Bats, such as fringed myotis (*Myotis thysanodes*), California myotis (*Myotis californicus*), and pallid bat (*Antrozous pallidus*) are likely to occur in

oak woodlands as well. Reptile and amphibian species common to blue oak woodland include western fence lizard (*Sceloporus occidentalis*), western rattlesnake (*Crotalus viridis*), common kingsnake (*Lampropeltis getulus*), sharp-tailed snake (*Contia tenuis*), and California slender salamander (*Batrachoseps attenuatus*).

Annual Grasslands

California annual grassland provides foraging and breeding habitat for many wildlife species. Grasslands are important foraging grounds for several species including California vole (*Microtus californicus*), Botta's pocket gopher (*Thomomys bottae*), western harvest mouse (*Reithrodontomys megalotis*), deer mouse (*Peromyscus maniculatus*), broad-footed mole (*Scapanus latimanus*), California ground squirrel (*Spermophilus beecheyi*), coyote (*Canis latrans*), black-tailed deer (*Odocoileus hemionus*), and black-tailed jackrabbit (*Lepus californicus*). Small rodents attract raptors (birds of prey) including red-tailed hawk (*Buteo jamaicensis*), American kestrel (*Falco sparverius*), white-tailed kite (*Elanus caeruleus*), red-shouldered hawk (*Buteo lineatus*), and barn owl (*Tyto alba*). This habitat also attracts avian seed and insect eaters. California quail (*Callipepla californica*), mourning dove (*Zenaida macroura*), savanna sparrow (*Passerculus sandwichensis*), and western meadowlark (*Sturnella neglecta*) are a few seed eaters that may forage in grasslands. Insect eaters such as scrub jay, western kingbird (*Tyrannus verticalis*), barn swallow (*Hirundo rustica*), white-throated swift (*Aeronautes saxatalis*) and mockingbird (*Mimus polyglottus*) may also use the habitat for foraging. Due to the relatively dry nature of this plant community, few if any amphibian species inhabit this habitat. However, annual grassland does provide suitable shelter, basking sites, and foraging habitat for reptiles such as western rattlesnake (*Crotalus viridis*), common kingsnake (*Lampropeltis getulus*), Pacific gopher snake (*Pituophis melanoleucus catenifer*), striped racer (*Masticophis lateralis*), and western fence lizard (*Sceloporus occidentalis*).

Riparian / Slate Creek

Stafford Lehr, an aquatic biologist with the CDFG (Region 2), was consulted to determine potential aquatic species associated with Slate Creek (Lehr, 1998). Mr. Lehr indicated that the CDFG had not performed any surveys for aquatic organisms within Slate Creek. Based on existing data and knowledge for the region, it is unlikely that Slate Creek supports salmonid species (i.e., steelhead, salmon). Fish species likely to occur in Slate Creek include Sacramento sucker (*Castosomus occidentalis*), California roach (*Hesperoleucus symmetricus*), green sunfish (*Lepomis cyanellus*), and bluegill (*Lepomis macrochirus*). Hardhead (*Mylopharodon conocephalus*) and Sacramento squawfish (*Pytchocheilus grandis*) may also occur. Slate Creek provides suitable habitat for foothill yellow-legged frog (*Rana boylii*) and marginally suitable habitat for California red-legged frog (*Rana aurora draytonii*) and northwestern pond turtle

(*Clemmys marmorata marmorata*). California red-legged frog and northwestern pond turtle prefer slower moving streams with dense, shrubby riparian vegetation.

Special-Status Species

Table 5.7-2 lists the special-status-species with potential to occur in the project site. This list was compiled based on the references discussed in Section 3.2. Reconnaissance surveys of the project site were conducted for special-status plants and animals with potential habitat in the project site. Species in **bold** type have the *potential* to be impacted by the Proposed Project. Specific surveys were conducted within appropriate habitat areas within or near the project site for the federally listed California red-legged frog, valley elderberry longhorn beetle, and rare plants. A list of all species encountered in the project site is provided in **Appendix G**. They are discussed in greater detail in the Impacts section.

5.7.3 Regulatory Setting

The Proposed Project will require a US Army Corps of Engineers Section 404 Nationwide Permit #14 (Linear Transportation Crossings) for approximately 0.057 acre (0.023 hectare) of fill to intermittent drainages and intermittent pond (Waters of the U.S.) located within the Proposed Project site. A Clean Water Act Section 401 Water Quality Certification Permit from the Regional Water Quality Control Board is also required for the discharge of dredge or fill material into Waters of the U.S.. Additionally, a Streambed Alteration Agreement (SAA) will be required by the California Department of Fish and Game.

Permits

U.S. Army Corp Of Engineers Section 404 Permit

Based on the current engineering drawings for the two design alternatives, the Proposed Project would qualify for Nationwide Permit (NWP) 14 (Linear Transporation Crossings). Based on the amount of fill that would occur (up to 0.057 acre or 0.023 hectare), a Pre-Construction Notification would not be necessary; however, it is recommended to ensure compliance with the Endangered Species Act and other acts.

Regional Water Quality Control Board Section 401 Certification

A Section 401 water quality certification will be required from the Regional Water Quality Control Board (RWQCB) prior to the discharge of any material into a regulated waterway.

Table 5.7-2 List of Potentially Affected Species

Species	Status Federal/State/ CNPS	Preferred Habitat & Diet	Potential for Project to Affect
Spotted bat *Euderma maculatum*	FSC/CSC/--	Variety of habitats, though rare; prefers cliffs; solitary/ more common in S. California; occasionally ranges N. to Tuolumne and Calaveras Counties.	Highly unlikely. No roosting habitat or known populations have the potential to be affected.
Greater western mastiff bat *Eumops perotis californicus*	FSC/CSC/--	Uncommon resident in SE San Joaquin Valley and Coast Ranges. Variety of open, dry habitats with suitable roosts e.g., vertical cliffs.	Highly unlikely. No roosting habitat or known populations have the potential to be affected.
Small-footed myotis *Myotis ciliolabrum*	FSC/--/--	Forages over grasslands and roosts in buildings, caves and rock crevices in relatively arid wooded and brushy uplands near water	Highly unlikely. No roosting habitat or known populations have the potential to be affected.
Long-eared myotis ***Myotis evotis***	**FSC/--/--**	**Forages over grasslands and roosts in snags, buildings, rock crevices, and primarily caves.**	**Medium Potential. The project site and/or immediate area provide limited suitable habitat for this species.**
Fringed myotis ***Myotis thysanodes***	**FSC/--/--**	**Forages over grasslands and roosts in snags, buildings, rock crevices, and primarily caves.**	**Medium Potential. The project site and/or immediate area provide limited suitable habitat for this species.**
Long-legged myotis ***Myotis volans***	**FSC/--/--**	**Forages over grasslands and roosts in snags, buildings, rock crevices, and primarily caves.**	**Medium Potential. The project site and/or immediate area provide limited suitable habitat for this species.**
Yuma myotis *Myotis yumanensis*	FSC/CSC/--	Forages over open water and streams and roosts in buildings, caves and rock crevices	Highly unlikely. No roosting habitat or known populations have the potential to be affected.
Bald eagle *Haliaeetus leucocephalus*	FT/--/--	Breeds in coastal habitats (lakes and rivers) and mixed conifer. Forages primarily over water and marshes	Highly Unlikely. The project site and/or immediate area do not support suitable habitat for this species.
Tricolored blackbird *Agelaius tricolor*	FSC/CFC/--	Nests in dense thickets of cattails, tules, willow, blackberry, wild rose, and other tall herbs near fresh water.	Highly Unlikely. The project site and/or immediate area do not support suitable habitat for this species.
Little willow flycatcher *Empidonax traillii brewsteri*	--/SE/--	Willow thickets near wet meadows or standing water from 2,000-8,000 feet in elevation.	Highly Unlikely. The project site and/or immediate area do not support suitable habitat for this species.
American peregrine falcon *Falco peregrinus anatum*	FD/SE/--	Nests near water on high cliffs and banks; riparian areas. Inland and coastal waters are important year round.	Highly Unlikely. The project site and/or immediate area do not support suitable habitat for this species.
California red-legged frog ***Rana aurora draytonii***	**FT/CSC/--**	**Quiet pools in streams, marshes, and ponds supporting dense stands of willows and cattails from 0-1,200 feet in elevation in the western foothills of the Sierra Nevada**	**Low Potential. While the Proposed Project would not have direct affects suitable habitat may be indirectly affected by highway runoff.**

Table 5.7-2 List of Potentially Affected Species

Species	Status Federal/State/ CNPS	Preferred Habitat & Diet	Potential for Project to Affect
Foothill yellow-legged frog *Rana boylii*	**FSC/CSC/--**	**In or near rocky streams in a variety of plant associations; always near permanent water/western slopes of Sierra Nevada, other CA hills**	**Low Potential. While the Proposed Project would not have direct affects suitable habitat may be indirectly affected by highway runoff.**
Western spadefoot *Scaphiopus hammondii*	FSC/CSC	Breed in shallow, temporary pools formed by winter rains. Takes refuge in burrows.	Highly Unlikely. The project site and/or immediate area do not support suitable habitat for this species.
Northwestern pond turtle *Clemmys marmorata marmorata*	**FSC/CSC/--**	**Requires aquatic habitats with suitable basking sites. Nest sites most often characterized as having gentle slopes (<15%) with sandy banks and little vegetation.**	**Low Potential. While the Proposed Project would not have direct affects, suitable habitat may be indirectly affected by highway runoff.**
California horned lizard *Phrynosoma coronatum frontale*	FSC/CSC/--	Open, sandy habitats below 4,000 feet in elevation.	Highly unlikely. The project site and/or immediate area do not provide suitable soils for this species.
Green sturgeon *Acipenser medirostris*	FSC/--/--	Spawn in Sacramento, Feather, and Klamath rivers, juveniles occur in estuaries	Highly unlikely. Tennessee and Slate Creeks eventually flow into Folsom reservoir. Folsom dam catches any potential downstream sedimentation.
Delta smelt *Hypomesus transpacificus*	FT/--/--	Delta habitats, rivers, lakes.	Highly unlikely. Tennessee and Slate Creeks eventually flow into Folsom reservoir. Folsom dam catches any potential downstream sedimentation.
Central Valley steelhead *Oncorhynchus mykiss*	FT/--/--	Delta habitats, rivers, lakes.	Highly unlikely. Tennessee and Slate Creeks eventually flow into Folsom reservoir. Folsom dam catches any potential downstream sedimentation.
Winter-run Chinook salmon *Oncorhynchus tshawytscha*	FE/SE/--	Delta habitats, rivers, lakes.	Highly unlikely. Tennessee and Slate Creeks eventually flow into Folsom reservoir. Folsom dam catches any potential downstream sedimentation.
Central Valley spring-run chinook salmon *Oncorhynchus tshawytscha*	FT/ST/--	Delta habitats, rivers, lakes.	Highly unlikely. Tennessee and Slate Creeks eventually flow into Folsom reservoir. Folsom dam catches any potential downstream sedimentation.
Central Valley fall/late fall-run chinook salmon *Oncorhynchus tshawytscha*	FC/SCS/--	Delta habitats, rivers, lakes.	Highly unlikely. Tennessee and Slate Creeks eventually flow into Folsom reservoir. Folsom dam catches any potential downstream sedimentation.
Sacramento splittail *Pogonichthys macrolepidotus*	FT/CSC/--	Delta habitats, rivers, lakes.	Highly unlikely. Tennessee and Slate Creeks eventually flow into Folsom reservoir. Folsom dam catches any potential downstream sedimentation.

Table 5.7-2 List of Potentially Affected Species

Species	Status Federal/State/ CNPS	Preferred Habitat & Diet	Potential for Project to Affect
Longfin smelt *Spirinchus thaleichthys*	FSC/CSC/--	Delta habitats	Highly Unlikely. Tennessee and Slate Creeks eventually flow into Folsom reservoir. Folsom dam catches any potential downstream sedimentation.
Valley elderberry longhorn beetle *Desmocerus californicus dimorphus*	FT/--/--	Elderberry shrubs at least 1" diameter below 3,000' in elevation.	Highly Unlikely. The project site and immediate area do not contain suitable habitat (elderberry shrubs).
South Forks ground beetle *Nebria darlingtoni*	FSC/--/--	Riverine shoreline habitat associated with the south fork of the American River.	Highly Unlikely. The project site and/or immediate area do not support suitable habitat for this species.
Stebbin's morning-glory *Calystegia stebbinsii*	FE/SE/1B	Open chaparral with gabbro soils.	Highly Unlikely. No gabbro soils occur in the project site.
Pine Hill ceanothus *Ceanothus roderickii*	FE/--/1B	Gabbro soils in open stands of chaparral near Pine Hill.	Highly Unlikely. No gabbro soils occur in the project site.
Red Hills soaproot ***Chloragalum grandiflorum***	**--/--/1B**	**Found in chaparral or woodland areas with gabbro or serpentine soils.**	**Low Potential. No plants were found on-site, but project may impact potential habitat (serpentine soils) for this species.**
Pine Hill flannelbush *Fremontodendron californicum* s *decumbens*	FE/--/1B	Usually found on the tops of rocky ridges with gabbro soils.	Highly Unlikely. No gabbro soils occur in the project site.
El Dorado bedstraw *Galium californicum sierrae*	FE/--/1B	Grows in live oak or black oak woodlands on gabbro soils.	Highly Unlikely. No gabbro soils occur in the project site.
Bisbee Peak rush-rose ***Helianthemum suffrutescens***	**--/--/3**	**Found in chaparral, mostly on gabbro or serpentine soils.**	**Low Potential. No plants were found on-site, but project may impact potential habitat (serpentine soils) for this species.**
Layne's butterweed ***Senecio layneae***	**FT/--/1B**	**Found in natural or disturbed rocky areas with chaparral, mostly on gabbro or serpentine soils.**	**Low Potential. No plants were found on-site, but project may impact potential habitat (serpentine soils) for this species.**
El Dorado County mule ears *Wyethia reticulata*	--/--/1B	Found in chaparral, woodlands and lower coniferous forest with clay or gabbro soils.	Highly Unlikely. No gabbro soils occur in the project site.

Source: USFWS 1999, CNDDB 2001, Skinner and Pavlik 1994

FE	Federally Endangered	FSC	Federal Species of Special Concern
FT	Federally Threatened	CSC	California Species of Special Concern
FD	Federally Delisted	1B	California Native Plant Society listing of Rare, Threatened, or Endangered plants in California
SE	California Endangered		
ST	California Threatened	3	Plants for which more information is needed

California Department of Fish and Game

A 1601 Streambed Alteration Agreement will be necessary for the project. A field visit with the CDFG will be conducted in order to discuss mitigation details.

U.S. Fish and Wildlife Service Section 7 Consultation

Under Section 7 of the endangered species act, Federal agencies are required to consult with the U.S. Fish and Wildlife Service (USFWS) when a proposed Federal action (or those actions permitted or funded by a Federal agency) may affect listed species. Based on field surveys and habitat assessments for the three federally listed species (California red-legged frog, valley elderberry longhorn beetle and Layne's butterweed), the Proposed Project is not likely to affect federally listed species, and formal consultation should not be required (see Section 7.0 for more information on potential effects).

5.7.4 Impacts and Mitigation Measures

Significance Criteria

An impact will be considered significant if either the Flyover Interchange Design Alternative or the Diamond Interchange Design Alternative adversely impact the biological resources in the region of where the interchange would be constructed.

Methodology

Botanical and wildlife surveys, including special-status species surveys were completed as part of the California Department of Transportation (Caltrans) Natural Environment Study (NES) process. In addition, a formal delineation of potential jurisdictional waters of the U.S. was completed.

The California Department of Fish and Game's (CDFG) California Natural Diversity Database (CDFG, 2001) was consulted for information concerning sensitive botanical and wildlife resources within the vicinity of the project. This database search was completed for habitats within El Dorado County and for United States Geological Survey (USGS) 7.5 minute quadrangles "Shingle Springs" and "Placerville." The database printouts are presented in **Appendix H**. In addition, the California Native Plant Society's (CNPS) inventory (Skinner and Pavlik, 2001) was consulted to identify special-status plants potentially occurring within El Dorado County. A botanical survey within the project site from April, 2000 is in **Appendix I.**

An on-site assessment of the proposed interchange area was conducted on August 2, 2001, December 27, 2001, and February 6 and 11, 2002. The project site was evaluated to determine the existing biological resources within the project area. The survey evaluated the potential for special status species and wetland resources occurring within the project area. A plant and animal list for the species encountered during the surveys is presented as **Appendix G**.

Impact/ Mitigation

Impact 5.7-1 Impacts to Upland Vegetation

AA Under the No Project/Action Alternative, there will be no change in the existing conditions within the project area. ***No impact*** will occur under the No Project/Action Alternative.

AB Up to 1.1 acres of mixed oak woodland could be permanently removed by the Fly-Over Interchange Alternative. These impacts could include the removal of several existing trees and some California annual grassland. If oak trees would be removed, this would be a ***significant mitigable impact***. While permanent impacts to California annual grassland are considered ***less than significant***, some revegetation may be necessary to prevent erosion of exposed soils previously covered in grassland vegetation.

AC Up to 1.67 acres of mixed oak woodland could be permanently removed by the Diamond Interchange Alternative. These impacts could include the removal of several existing trees and some California annual grassland. If oak trees would be removed, this would be a ***significant mitigable impact***. While permanent impacts to California annual grassland are considered ***less than significant***, some revegetation may be necessary to prevent erosion of exposed soils previously covered in grassland vegetation.

Mitigation 5.7-1 Impacts to Upland Vegetation

The impact identified above will be reduced to a ***less than significant*** level with the implementation of the following mitigation:

(A) The removal of riparian and upland vegetation will be minimized whenever possible.

(B) Temporally impacted annual grasslands and valley oak woodland will be restored by replanting native and naturalized species endemic to the site,

including valley oak (*Quercus lobata*), blue oak (*Quercus douglasii*), and native grass seed (as described in Section 4.0).

(C) All temporarily disturbed areas will be restored to original grade and revegetated to minimize erosion. The replanting process will be on-going throughout construction, with planting beginning as construction related activities end in a given area. Riprap will not be used as a substitute for revegetation except in areas where the project Engineer has deemed that vegetation will not likely become reestablished and channel erosion protection is necessary. Additional erosion control measures, such as straw mulch, may be used if vegetation cannot be immediately established during the wet season.

(D) In order to compensate for potential habitat on the site that would be lost to development, a payment into to El Dorado County's approved mitigation area for threatened and endangered plants of the Pine Hill gabbro formation shall be made. This payment should follow the County's formula, based on the number of square feet of development within different "mitigation zones."

Impact 5.7-2 Impacts to Non-Special Status Species

AA Under the No Project/Action Alternative, there will be no change in the existing conditions within the project area. ***No impact*** will result under the No Project/Action Alternative.

AB, AC Construction of the interchange will result in short-term impacts to terrestrial wildlife. There is a regional abundance of common wildlife species and the relatively small amount of area that would be impacted permanently or temporarily will be ***less than significant*** to common wildlife.

Mitigation 5.7-2 Impacts to Non-Special Status Species

None Required.

Impact 5.7-3 Impacts to Special-Status Species

AA Under the No Project/Action Alternative, there will be no change in the existing conditions within the project area. ***No impact*** will result under the No Project/Action Alternative.

AB, AC There could be impacts to plant and animal special-status species within the project area. **Appendix G** lists all species observed during field investigations. None of the special-status species addressed in this document were observed in the project area. Nevertheless, actions will be undertaken to mitigate for the potential that special-status species could be in the project area.

Mitigation 5.7-3 Impacts to Special Status Species

The impact identified above will be reduced to a ***less than significant*** level with the implementation of the following mitigation:

(A) Tree removal shall occur between October and February, which is outside of the nesting period for raptors.

(B) If the timing of the above Measure is not feasible, pre-construction nest surveys of trees to be removed and within 500 feet of construction activities will be conducted to ensure that no occupied nests are destroyed or disturbed. A qualified biologist shall conduct surveys prior to any vegetation removal that lies within the nesting period (i.e., March to July). If an occupied nest of a special-status bird is identified in vegetation planned for removal, the disturbance will be delayed until fledging of the nesting young has been verified by a subsequent survey. The CDFG will be consulted for any additional requirements if a nest is identified.

(C) Special-status bat species may roost behind loose bark on large snags in the Environmental Study Limits during the night or day. Mitigation may be achieved by surveying snags, that have a diameter at breast height (DBH) greater than 15 inches (38.1 centimeters), for evidence of roosting bats prior to removal. Snags should be should be checked in the evening and morning for the presence of bats by a qualified biologist prior to any removal activities. If any bats are present in the snags, the biologist should remove the bat for safe relocation at nighttime (bats flying during the day could be subject to predation by birds-of-prey).

Impact 5.7-4 Impact to Wetlands/Waters of the United States

AA Under the No Project/Action Alternative, there will be no change in the existing conditions within the project area. ***No impact*** will result from the No Project/Action Alternative.

AB, AC Approximately 0.057 acre (0.023 hectare) of "waters of the U.S" would be permanently impacted by the construction of the Proposed Project. This permanent impact consists of the fill of a portion of an intermittent drainage during construction of the roadway, and is considered a ***significant mitigable impact***. Temporary impacts are those areas within 100 feet (30.5 meters) of the construction footprint within the project site. Up to 0.033 acre (0.013 hectare) of "waters of the U.S." could be temporarily impacted on-site. Any potential temporary impacts to Slate Creek may be avoided with the use of Best Management Practices (BMPs). No jurisdictional wetlands occur within the project boundaries. A Nationwide 14 permit will be obtained from the ACOE and a 1601 Streambed Alteration Agreement from CDFG.

Mitigation 5.7-4 Impact to Wetlands/Waters of the United States

The impact identified above will be reduced to a ***less than significant*** level with the implementation of the following mitigation:

(A) Construction activities within 100 feet (30.5 meters) of intermittent streams will be restricted to the period of April 15 through October 15 to minimize the potential for rainfall events to mobilize and transport sediment to aquatic resources, or a BMP Plan designed to minimize sediment transport and approved by Caltrans will be implemented during construction activities.

(B) Appropriate mulch will be applied to areas where vegetation has been removed to reduce short-term erosion as soon as feasible after construction. Soils will not be left exposed during the rainy season.

(C) Silt fencing will be placed upstream and downstream of the construction zone to prevent sediment disturbed during construction from being transported and deposited outside of the construction zone.

(D) Sediment control measures will be in place prior to the onset of the rainy season and will be monitored and maintained in good working condition throughout the year.

(E) A spill prevention plan will be implemented for potentially hazardous materials. The plan will include the proper handling and storage of all potentially hazardous materials, as well as the proper procedures for cleaning up and reporting of any spills. If necessary, containment berms

will be constructed to prevent spilled materials from reaching aquatic resources.

Impact 5.7-5 Cumulative Impact

AA Under the No Project/Action Alternative, there will be no change in the existing conditions within the project area. ***No impact*** will result from the No Project/Action Alternative.

AB, AC Both alternatives may contribute to cumulative effects through reducing the amount of oak woodland habitat in the Sierra foothills. Proposed and current residential and commercial development along the Highway 50 corridor has likely reduced dispersal, foraging, and breeding habitat for several species of wildlife, thereby reducing the viability of local populations. Implementation of either alternative may contribute to this reduction in habitat, resulting in reduced management options. However, the Proposed Project is not expected to contribute significant cumulative impacts because of the relatively small area that will be impacted by the project and because of the mitigation measures that will be implemented as part of the project, which has reduced project effects to a ***less than significant*** level.

Cumulative effects to special status plants have occurred through the increased rate of construction of homes and businesses on the gabbro soils during the last 10 to 20 years. There has been extensive development along the Highway 50 corridor during this time period, with much of the land being cleared for commercial and residential uses. Residential construction in the nearby Cameron Park area in the midst of the chaparral community has limited the amount of potential habitat for these species in the foothills. Implementation of either of the proposed alternatives has the potential to contribute to this loss of habitat. However, with the implementation of mitigation measure 5.7-4, this cumulative effect will be reduced to a ***less than significant*** level.

5.8 Visual Resources

5.8.1 Introduction

The Visual Resources section of the EIR analyzes the potential short-term, long-term, and cumulative impacts resulting from the construction and operation of the Project and alternatives. The visual resources discussion will analyze the visual resources conditions in the proposed Shingle Springs Interchange area.

5.8.2 Environmental Setting

The project site is located approximately 3 miles (4.8 km) east of the Shingle Springs community and 5 miles (8 km) west of the City of Placerville. The land uses surrounding the project site can best be characterized as rural residential. There are no sensitive receptors within the immediate vicinity of the interchange project site (as seen from Highway 50).

Existing Interchanges

This section presents information regarding the existing interchanges that occur east and west of the project site. For purposes of this discussion, all interchanges located west of the project site to the El Dorado County line are presented, as well as all existing interchanges east of the project site to the City of Placerville. The intent is to provide information about the type of interchanges that have been constructed and associated land uses surrounding these facilities. The El Dorado County line is located approximately 11 miles (18 km) west of the project site.

The main communities within this area include El Dorado Hills, Cameron Park and Shingle Springs. There are 6 interchanges on Highway 50 within this 11-mile (18 km) distance. Two of the existing interchanges contain aboveground diamond type structures: (1) Cambridge Road, and (2) North Shingle Road/Motherlode Drive. The remaining interchanges contain no above ground structures.

Traveling east of the project site, there are 4 interchanges between the site and the City of Placerville. Three of the four interchanges contain aboveground diamond type structures: (1) El Dorado Road, (2) Diamond Springs/Missouri Flat Road, and (3) Forni Road/Placerville Drive. The fourth interchange contains no above ground structure. **Tables 5.8-1** and **5.8-2** list the existing interchanges located west and east of the project site.

Appendix J provides a topographic map and pictures of each of interchange that contains above ground structures. Also included within **Appendix J** are photos that show the commercial and/or residential development located near the interchanges and Highway 50.

Table 5.8-1 Interchanges West Of Project Site

Interchange	Miles from Project Site (kilometers)	Type of Interchange
El Dorado Hills Boulevard	10.7 (17.2)	Undercrossing with no above ground structures.
Bass Lake Road	8.2 (13.2)	Undercrossing with no above ground structures.
Cambridge Road	6.6 (10.6)	Diamond interchange.
Cameron Park Drive	4.8 (7.7)	Undercrossing with no above ground structures.
North Shingle Road/Motherlode Drive	3 (4.8)	Diamond Interchange.
Shingle Springs Drive	1.2 (1.9)	Undercrossing with no above ground structures.

Source: AES, 2001
Note: Interchanges to the west on Highway 50 to the El Dorado Border

Table 5.8-2 Interchanges East Of Project Site

Interchange	Miles from Project Site (kilometers)	Type of Interchange
Forni Road/Placerville Drive	4.8 (7.7)	Diamond Interchange.
Diamond Springs/Missouri Flat Road	3.8 (6.1)	Diamond Interchange.
El Dorado Road	2.7 (4.3)	Diamond interchange.
Greenstone Road	1 (1.6)	Undercrossing with no above ground structures.

Source: AES, 2001
Note: Interchanges to the east on Highway 50 to the City of Placerville.

Existing Views Leading To The Proposed Interchange Site

The project site is located within the rolling foothills of the Sierra Nevada, and as such, the view of the project site from Highway 50 is confined to a relatively small distance. The highway contains numerous changes in vertical distance as one approaches the proposed interchange site from both the east and west. A site visit conducted by AES staff reveals that as one approaches the project site from the west, the ridge top (near the interchange location) can be seen in the distance approximately 1 mile to the west. Approaching the site from the east, the interchange site can be seen approximately 1.0 mile (1.6 km) from the site. **Figure 5.8-1** shows the site distance east and west along Highway 50 where the project site would be visible. Adjacent uses along this stretch of Highway 50 were noted to determine the existence of sensitive land uses. The vast majority of the land adjacent to the 2-mile (3.2 km) view corridor of Highway 50 contains no sensitive receptors. There are a few houses southeast of the project site that could possibly see the project site in the distance.

Existing Views From Proposed Interchange Site

Figure 5.8-2 provides a panoramic view of the surrounding land uses as viewed from a spot immediately north of Highway 50 where the interchange will be located. As can be seen from

See **Figure 5.8-1**

See Figure 5.8-2

Figure 5.8-2, the view west of the project site consists of the Highway 50 cut banks and the ridge of Highway 50 that drops off topographically traveling west towards Shingle Springs Drive. There is dense vegetative coverage and no visible structures on the ridges looking west.

The view looking north from the proposed interchange site shows dense vegetative cover that essentially blocks the northerly view a short distance from the Highway. No structures are visible from the northerly view.

The view looking east of the proposed interchange site drops off into the foothills leading to the City of Placerville located approximately 5 miles (8 km) from the project site. The Sierra Nevada mountain range can be seen in the distance. There are several houses on the ridge top just south of this view that are barely visible in the distance.

The view looking south of the proposed interchange site is limited due to the existing vegetative canopy coverage and vertical drop-off of the land as one moves south away from the project site. A ridge top of the foothills can be seen in the distance. No structures are visible from this view.

Existing Urbanized Development In The Project Vicinity

There are many businesses that are adjacent to Highway 50 between the Shingle Springs community and City of Placerville. At Missouri Flat Road and Highway 50 east of Placerville (approximately 4 miles/6.5 km northeast of the project site), there are businesses on the north and south sides of Highway 50. Prospector's Plaza is on the north side of Highway 50. This shopping center consists of three large retail stores (e.g., K-Mart), various shops, and four banks. The development has a setback of less than 50 feet (15 meters) from Highway 50 and has two-story structures on the site. A restaurant (Eppies), motel (Best Western), and church (Placerville Seventh Day Adventist Church) are on the south side of Highway 50. The church has a setback of less than 50 feet (15 meters) from Highway 50 and is taller than a two-story building. Eppies and Best Western Motel each have a setback of approximately 100 yards (91 meters) from Highway 50 and the Best Western Motel is three stories high.

At El Dorado Road and Highway 50 (approximately 2.7miles/4.3 km east of the project site), there is a Homebuilders Outlet on the north side of Highway 50 and an El Dorado Savings Bank on the south side. The Homebuilders Outlet has a setback of approximately 50 yards

(46 meters) from Highway 50 and the El Dorado Savings Bank has a setback of approximately 100 yards (91 meters) from Highway 50 and is two-stories high.

At North Shingle Road and Highway 50 in Shingle Springs (approximately 3 miles/5 km west of the project site), there are businesses on the north and south sides of the freeway. On the north side of Highway 50 is Sports Central, Sentry Storage, Shingle Springs Nissan/Subaru/Kia, and Shingle Springs Chrysler/Plymouth/ Dodge. All the businesses mentioned above each have a setback of approximately 50 yards (46 meters) from Highway 50 and are two-stories in height. On the south side of Highway 50, there is the Gold Harvest Market, a commercial business district, and two other commercial business developments adjacent to Highway 50. The Gold Harvest Center has a setback of less than 50 feet (15 meters) from Highway 50 and is two-stories high. The commercial business district (east of Ponderosa Road) has various service-oriented businesses that are directly adjacent to Highway 50 (less than 50 feet/15 meters). Some of these businesses are two-stories in height. The two other commercial business developments adjacent to Highway 50 (west of Ponderosa Road) are comprised of three two-story structures. Two of them are brick and one is a log cabin. Each provides a variety of retail- and service-related businesses. Each of these developments has a setback of less than 50 feet (15 meters) from Highway 50 and is two-stories in height.

5.8.3 Regulatory Setting

Highway 50 is officially designated as a State Scenic Highway from Placerville eastward to South Lake Tahoe. The designated highway begins at Post Mile 16.78 near the eastern limit of the government center buildings. The project site, and highway view corridor leading to the project site are located outside of the boundaries of the designated highway.

5.8.4 Impacts And Mitigation Measures

Significance Criteria

A visual resource impact would exist if the project would result in any of the following, which are adapted from CEQA *Guidelines*.

- Result in a substantial adverse effect on a scenic vista,
- Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway,
- Create a new source of substantial light or glare, which would adversely affect day or nighttime view in the area.

Methodology

Potential visual impacts were assessed. The physical attributes of the project alternatives are analyzed from three views – westward, eastward, and northward – with photo simulations presenting visual reference.

Impact/ Mitigation

Impact 5.8-1 Impacts To Visual Resources

AA Under the No Project/Action Alternative, the interchange would not be constructed; therefore, no visual change would occur on or around the project site. ***No impact*** will result from the No Project/Action Alternative.

AB, AC There are two vantage points for the Fly-Over Interchange Design Alternative and the Diamond Interchange Design Alternative. (1) westward view, and (2) eastward view. Photo simulations have been developed to depict the two types of interchange alternatives.

As can be seen from the vantage points presented in **Figures 4-1** and **4-2**, the Flyover Interchange would introduce a new urban feature (i.e., interchange) into the environment.

As the eastbound traveler approaches the ridge of the project site, the bridge structure would come into view. An open view to the foothills of the Sierra Nevada will be off in the distance. This interrupted view of the Sierra Nevada would only occur for a short traveling distance. This is due to the fact that the rolling nature of Highway 50 in the vicinity of the project site only brings the mountains into view when the crest of the ridge top is reached. Within seconds of traveling time, the view would be uninterrupted as the eastbound traveler crosses under the bridge. The interrupted view of the mountain range in the distance is considered to be so brief that it is not considered a significant impact on a scenic vista/resource.

The westbound traveler would have a longer uninterrupted view of the new interchange than the eastbound traveler. This is due to the uphill nature of the westbound approach, and the fact that the interchange structure is located on the eastern side of the ridge top. The most dominate view on the westbound approach is the Highway 50 cut bank that was engineered to make way for the

highway alignment. Although the interchange is considered a new urban feature for westbound travelers, it is considered to be a less than significant impact upon the scenic vista/resource.

Retaining Walls. Another feature of the project design is the development retaining walls on the south side of the highway and a scaling back of the cut bank on the north side of the highway. Retaining walls will be required between Route 50 and the eastbound off-ramp and between the eastbound off-ramp and the right-of-way line. The lower retaining wall, between the existing eastbound lanes on Route 50 and the eastbound off-ramp, will be approximately 640 feet (195m) long and will vary from 2.7 feet (0.8m) high to 28 feet (8.5m) high. The upper retaining wall, between the eastbound off-ramp and the right-of-way line along the south side of Route 50 will be approximately 426 feet (130m) and will vary from 2.7 feet (0.8m) high to 30 feet (9.2m) high. The concrete used to construct the retaining walls will be tinted to further blend the retaining wall into the surrounding rock. Neither the north or south cut banks on Highway 50 are considered to be scenic rock outcroppings. They exist due to the construction of Highway 50 which created the cut banks to make room for the roadway. A ***less-than-significant impact*** is expected given that the retaining walls will not be in a visually sensitive area and that treatment of the walls will result in compatibility with the surrounding landscape.

Lighting. Lighting will be required in the areas where the off-ramps diverge from Route 50, where the on-ramps merge with Route 50, and in the area where the on and off-ramps converge together north of Route 50. Lighting for the proposed interchange will incorporate all applicable lighting ordinances. Caltrans lighting standards and mast arms will be implemented, consistent with Caltrans Type 15 (Standard Plan ES-6A), on any lighting structures that are within the Caltrans right-of-way. Additionally, flush soffit luminaries (Caltrans Standard Plan ES-9F) will be provided on the undercrossing structure, where the eastbound on-ramp passes under Route 50 for safety purposes. Low intensity lighting will also be provided on the underside of bridge rails, to illuminate the aesthetic treatment of the railing, which will not illuminate the roadway or the surrounding areas. Any lighting associated with the interchange after the Caltrans right-of-way will comply with El Dorado County lighting ordinance (17.14.170), which limits artificial light and glare and restricts unnecessary illumination of adjacent properties. Specific

requirements include hooded or screened outdoor lighting so as to direct the source of light downward and focus onto the property from which it originates, top and side shielded outdoor lights, and limitations regarding hours and the degree to which lights can exceed below the horizontal plane. Given the above standards that will apply to the interchange lighting, a ***less-than-significant*** impact will result.

As can be seen from the vantage points presented in **Figures 4-3** and **4-4**, the Diamond Alternative would introduce a new urban feature (i.e., interchange) into the environment.

The Diamond Alternative would result in an alteration of the visual character of the project area. The visual effect of the Diamond Alternative would be more pronounced when compared with the Flyover Alternative; however, for all of the reasons stated for the Flyover Alternative, the Diamond Alternative is not expected to result in a significant impact.

As noted in the Regulatory Setting discussion, the project site does not exist within a state scenic highway; therefore, a less than significant impact will exist.

The Flyover Interchange Design Alternative and the Diamond Interchange Design Alternative are not expected to result in a significant impact to visual resources.

Mitigation 5.8-1 Impacts To Visual Resources

None Required.

Impact 5.8-2 Cumulative Impacts to Visual Resources

AA Under the No Project/Action Alternative, the interchange would not be constructed; therefore, no visual change would occur on or around the project site. ***No impact*** would occur under the No Project/Action Alternative.

AB, AC The roadway network surrounding the project site is assumed to remain the same for cumulative conditions as currently exist for existing conditions. There are no programmed improvements for Highway 50 for cumulative conditions; therefore, a 4-lane facility is assumed for cumulative conditions in the vicinity of the project site. ***Alternatives B and C will not add to altered***

cumulative conditions for visual resources along the highway. The visual effects of constructing a hotel and casino on the Rancheria are detailed in Chapter 9 of this EIR/EA.

Mitigation 5.8-2 Cumulative Impacts to Visual Resources

None Required.

5.9 Socioeconomics

5.9.1 Introduction

Both NEPA and CEQA, and the regulations and guidelines that implement these laws, require consideration of social and economic impacts of projects in preparation of environmental documents. NEPA and CEQA policies state that consideration is to be given to qualitative factors and unquantitfiable environmental amenities and values, along with economic and technical considerations in decision-making that may affect the environment.

Pursuant to Section 15064(e) of the CEQA Guidelines, economic and social changes resulting from a project shall not be treated as significant effects on the environment. Economic or social changes may be used, however, to determine that a physical change shall be regarded as a significant effect on the environment. Where economic or social effects of a project cause a physical change, the physical change may be regarded as a significant effect in the same manner as any other physical change resulting from the project. Alternatively, economic and social effects of a physical change may be used to determine that the physical change is a significant effect on the environment. If the physical change causes adverse economic or social effects on people, those adverse effects may be used as a factor in determining whether the physical change is significant.

Socioeconomic impacts analyzed in this section include: social or economic use of the surrounding land, displacement of persons or housing, and adverse effects on minority and/or low-income populations.

5.9.2 Environmental Setting

Socioeconomic Characteristics Of El Dorado County and Project Area

The project site is located in the west-central area of El Dorado County directly south of the Shingle Springs Rancheria. Approximately 80 percent of the County's 152,942 residents live in the unincorporated areas (California Department of Finance, 2001). This includes approximately 2,643 people living in the nearby town of Shingle Springs. Major residential communities exist in El Dorado Hills, Cameron Park, and to a lesser extent Shingle Springs, in the western part of the County. These residential communities serve as suburban areas to the booming Sacramento metropolitan region. There are two incorporated cities within the County. Placerville, the county seat (population 9,610), is located approximately nine miles east of the project site. South Lake Tahoe (population 23,609), approximately 70 miles east of the project site, is the hub of the Lake Tahoe recreation area. Two major highways, U.S.

50 and State Route 49, intersect the county while State Route 88 establishes the county's southern border with Amador and Alpine Counties.

With regard to ethnicity, approximately 93 % of individuals residing in the project area (Census Tract 309.02) defined categorized themselves as white alone. Approximately 3% identified themselves as American Indian or Alaska Native and nearly 2% identified themselves as Asian. Less one percent identified themselves as other races including African American or Native Hawaiian (US Census Bureau, 2000).

Total population nearly doubled between the 1970 and 1980 census years, then nearly doubled again by the 1990 Census. Population increased by approximately 21% in the last ten years and according to the California Department of Finance, the County's population will increase by approximately 46 to 62 percent in the next ten years. Studies show that 78.2% of the population increases since 1980 are due to the overall growth of the Sacramento region with the majority of the growth in El Dorado County occurring in the El Dorado Hills/Cameron Park area.

The population of the project area, located in Census Tract 309.02, grew at a slightly lesser rate than that of the rest of the county. In 1990, the population for the study area was 3,947 persons, and in 2000 it had risen to 4,367 - a 10.6 % increase. From 1990 – 2000 El Dorado County's population grew by 24.1 %, while the study area population grew by only 10.6 % - a 13.5 % difference.

Tourism is the single most significant component of the regional economy and is likely to remain a dominant employer in the future. This sector accounts for almost one third of the jobs in El Dorado County, mostly related to restaurants, lodging, and recreational activities. El Dorado is among the top twenty counties in California for tourist revenue. Highway 50, itself, which serves the cities of South Lake Tahoe and Placerville and nearby recreation areas, is a large economic asset to the county. Consumers using Highway 50 provide a great deal of economic activity to the region. Most of the region's labor force is composed of retail, office, and medical workers. There is a small sector of the labor force that is seasonal; most of the workers within this sector are employed in the winter (M. Cubed, 2000, El Dorado County Economic Development Department, 2001, El Dorado County Chamber of Commerce, 2001).

The median household income for El Dorado County is $35,058, while the median income of the project area (Census Tract 309.02) is $48,531. The median household income for the nation is $41,349 (Census 2000). Clearly, residents of the study area have higher incomes than residents of the region and the nation.

Socioeconomic Characteristics Of The Shingle Springs Rancheria

According to Tribal Data Resources, the Shingle Springs Rancheria has an enrollment of 334 individuals, although only 18 live on the Rancheria property. As expected, Native Americans dominate the ethnic make up of the Rancheria community. **Table 5.9-1** contains an overview of the population and ethnic characteristics of the community. The general membership resides in 180 households living on and off of the reservation. According to the 2000 Census, there are sixteen housing units on the Rancheria property.

Table 5.9-1 Shingle Springs Rancheria Community Population

Ethnicity	Population	Percent of Community
Native American / Alaskan	272	81.4.
Other	53	15.9.
White	7	2.1
Black	1	0.3.
Hispanic	1	0.3
Asian	0	0.
Total Individuals	334	100

Source: Tribal Data Resources, Shingle Springs Rancheria Tribal Demographics Summary, 1999.
U.S. Census Bureau, 2001.

The median income of the Shingle Springs Rancheria is considerably lower than that of El Dorado County. **Table 5.9-2** displays the median income distribution of the Rancheria. As shown in the table, 145 or 81 percent earned less than 80 percent of the county's median household income in 1997. Further emphasizing the low economic status of the community, 117 households, or 65 percent, earn less than half of the county median income. No employment currently exists on the Rancheria due to the restricted access.

Table 5.9-2 Household Income As Percent Of Median County Income

Level	Income	Households	Percent
More than 120 %	> $46,650	13	13
80% to 120%	$31,100 - $46,650	22	12.2
50% to 80%	$19,440 - $31,100	28	15.6
30% to 50%	$11,660 - $19,440	50	27.8
Less than 30%	< $11,660	67	37.2
Total Households		180	100.0

Source: Tribal Data Resources, Shingle Springs Rancheria Tribal Demographics Summary, 1999

Members of the Shingle Springs Band generally reside at a standard of living well below that of the other residents of the county. Of the tribal members, 174 or 62% live within the Rancheria's service area. Seventy-nine are employed; however, they tend to be employed in low-wage jobs. Twenty-two, or one-quarter of the labor force, earn less than $9,840 per year, which is the poverty level. Another 10 residents, or 11% of the labor force, are unemployed. By comparison, the unemployment rate in El Dorado County was 3.9% for November 2000 (California Employment Development Department, 2001).

5.9.3 Regulatory Setting

On February 11, 1994, President Clinton signed *Executive Order 12898, Federal Action to Address Environmental Justice in Minority and Low-Income Populations.* This order requires each federal agency to administer and implement programs, policies, and activities that affect human health or the environment so as to identify and avoid “disproportionately high and adverse” effects on minority and low-income populations. In accordance with Executive Order 12898, this section identifies where minority and low-income populations reside, identifies public participation efforts to date, and analyzes project impacts related to low and moderate-income persons and minority persons. One means of determining poverty levels is median income. Eighty percent of median county income is used by Housing and Urban Development (HUD) and other federal agencies to define low-income. Fifty percent of median is considered very-low income. Income limits, adjusted for household size, are published annually by HUD for federal affordable housing programs. The statutory basis for HUD’s income limit policies is Section 3 of the U.S. Housing Act of 1937, as amended. These policies have been embraced by the California Department of Housing and Community Development (HCD), which administers income-restricted grant programs for small cities and counties like El Dorado. Minority neighborhoods are those defined by Census Tracts or Block Groups that have higher concentrations (10 percent or more) of minority (or non-white) persons than the County overall.

5.9.4 Impacts And Mitigation Measures

Significance Criteria

In an effort to define “significant” impacts, the concept of “thresholds of significance” has evolved. Such thresholds can be devised when dealing with air, water, and other health-based standards. Unfortunately, such standards do not exist in the social sciences (i.e. community analysis). For the purposes of this analysis, potential project impacts are considered significant if they would:

- present barriers to continued existing or planned land uses, deprive neighboring property owners of social or economic use of their land, fundamentally change the character of a neighborhood; or
- result in involuntary displacement of persons or housing or require relocation pursuant to the property acquisition and relocation standards of the State of California, the Caltrans Relocation Assistance Program or the Federal Relocation Assistance and Real Property Acquisition Policies Act of 1970; or
- disproportionately and adversely affect minority and/or low-income populations, including effects on housing and business development and effects related to post construction conditions (e.g. environmental health, noise, and air quality conditions); or
- physically divide an established neighborhood, present barriers or access limitations that would impede planned residential growth or other uses of land, or disrupt neighborhood cohesion.

Methodology

Potential impacts of the project alternatives on the surrounding community were analyzed with regards to the significance criteria.

Impact/ Mitigation

Impact 5.9-1 Socioeconomic Character Of Surrounding Area

AA Under the No Project/Action Alternative, the interchange would not be constructed; therefore, the hotel/casino complex would not be constructed. ***No impact*** would occur under the No Project/Action Alternative.

AB, AC The project area is characterized by rural residential land uses and relatively large parcel sizes. The project would not result in the removal of businesses or represent a substantial impairment to the economic viability of an existing commercial district. There are no businesses within the project area as defined in Chapter 5.0. The project would not impede planned economic growth, as there are no planned commercial land uses locally, and regional plans for economic growth would be determined by El Dorado County. ***The Construction of an interchange at the project site will not result in a significant impact to the socioeconomic character of the surrounding area.***

Mitigation 5.9-1 Socioeconomic Character Of Surrounding Area

None Required.

Impact 5.9-2 Displacement Of Persons Or Housing

AA Under the No Project/Action Alternative, the interchange would not be constructed; therefore, the hotel/casino complex would not be constructed. ***The No Project/Action Alternative will not result in a significant impact to the surrounding community with regards to the displacement of persons or housing.***

AB, AC Both design alternatives would be constructed within existing Caltrans right-of-way (ROW) and a five-acre parcel connecting the Shingle Springs Rancheria to Highway 50. The existing residence on the 5-acre parcel is owned by the Rancheria and is currently occupied by a Tribal member. The tribal member will move back into a residence on the Rancheria once construction begins.

The access road would cross under Artesia Road that currently provides access to two residential parcels east of the proposed roadway. The undercrossing will assure that access to the two residential parcels is maintained. ***The Flyover Interchange Design Alternative and Diamond Interchange Design Alternative are not expected to result in a significant impact to the surrounding community with regards to the displacement of persons or housing.***

Mitigation 5.9-2 Displacement Of Persons Or Housing

None Required.

Impact 5.9-3 Minority And/Or Low-Income Populations

AA Under the No Project/Action Alternative, the interchange would not be constructed. The impact associated with minority and/or low-income populations is related to the lack of an ability to construct commercial generating uses on the Rancheria. This effect is considered an indirect effect that is discussed within Chapter 9 of this EIR/EA. For purposes of this

analysis, there are no direct effects of not constructing the proposed interchange. ***The No Project/Action Alternative will not result in a significant impact to minority and/or low-income populations.***

AB, AC There are two potentially affected neighborhoods or residential subdivisions adjacent to the Shingle Springs Rancheria within the study area. Those neighborhoods are "Grassy Run" to the northeast and "Buckeye Rancheros" to the west/southwest of the Rancheria. However, as mentioned above, the median income of the project area is above that of the nation, and there are few minorities living in the project area. The only low-income and minority population that has been identified is the Shingle Springs Rancheria community, which will directly benefit from improved emergency and commercial access. ***The Flyover Interchange Design Alternative and Diamond Interchange Design Alternative are not expected to result in a significant impact to minority and/or low-income populations.***

Mitigation 5.9-3 Minority And/Or Low-Income Populations

None Required.

Impact 5.9-4 Neighborhood Impacts

AA Under the No Project/Action Alternative, the interchange would not be constructed. There would be no impacts to surrounding neighborhoods. ***The No Project/Action Alternative will not result in a significant impact to surrounding neighborhoods.***

AB, AC There are two potentially affected neighborhoods or residential subdivisions adjacent to the Shingle Springs Rancheria within the study area. Those neighborhoods are "Grassy Run" to the northeast and "Buckeye Rancheros" to the west/southwest of the Rancheria. However, neither alternative design of the proposed interchange would physically divide these neighborhoods, present barriers or access limitations that would impede planned residential growth or other uses of land, or disrupt community cohesion. ***The Flyover Interchange Design Alternative and Diamond Interchange Design Alternative are not expected to result in a significant impact to surrounding neighborhoods.***

Mitigation 5.9-4 Neighborhood Impacts

None Required.

Impact 5.9-5 Cumulative Socio-Economic Impacts

AA Under the No Project/Action Alternative, the interchange would not be constructed. The lack of an interchange to the Rancheria will result in the inability to develop revenue generating uses and provide adequate ingress/egress from the Rancheria. However, this is treated as an indirect effect within Chapter 9 of this EIR/EA. ***The No Project/Action Alternative will not contribute to cumulative socioeconomic effects.***

AB, AC The interchange alternatives will not contribute to significant cumulative effects associated with the displacement of persons or housing. As discussed in Impacts 5.9-2, there is only one house that will be affected. This house is currently owned and occupied by Tribal members. This project, considered together with cumulative growth, will not result in cumulative displacement of people or housing. The same is true for the socioeconomic character of the surrounding area. The proposed interchange will not prevent people from accessing their properties. Since there are no transportation related cumulative development projects to consider for the project area, no cumulative effects will be experienced. The increased traffic along the roadway network, resulting from cumulative growth, will not prevent the use of adjacent property. Lastly, the proposed interchange will not result in a cumulative effect to minority and/or low income populations. ***The Flyover Interchange Design Alternative and Diamond Interchange Design Alternative are not expected to result in a significant cumulative socioeconomic impact.***

Mitigation 5.9-5 Cumulative Socio-Economic Impacts

None Required.

5.10 Cultural Resources

5.10.1 Introduction

The cultural resources section of this EIR/EA compiled information about properties in the project vicinity and their status as related to cultural resources. This section analyzes the potential short-term, long-term, and cumulative impacts resulting from the construction and operation of the Proposed Project and alternatives. The following discussion will analyze the cultural and historic conditions in the proposed Shingle Springs Interchange area.

5.10.2 Environmental Setting

Prehistory

The earliest residents in the Great Central Valley and adjacent lands along the Valley margin are represented by the Fluted Point and Western Pluvial Lakes Traditions, which date from about 11,500 to 7,500 years ago (Moratto 1984). Within portions of central California, fluted projectile points have been found at Tracy Lake (Heizer 1938) and around the margins of Buena Vista Lake in Kern County. Similar materials have been found to the north, at Samwel Cave near Shasta Lake and near McCloud and Big Springs in Siskiyou County. These early peoples are thought to have subsisted using a combination of generalized hunting and lacustrine exploitation (Moratto 1984).

These early cultural assemblages were followed by an increase in Native population density after about 7,500 years ago. One of the most securely dated of these assemblages in north-central California is from the Squaw Creek Site located north of Redding. Here, a charcoal-based C-14 date suggests extensive Native American presence around 6,500 years ago, or 4,500 B.C. Most of the artifactual material dating to this time period has counterparts further south, around Borax (Clear) Lake northwest of Sacramento, and the Farmington Area in a Valley setting east of Stockton. Important artifact types from this time period include large wide-stemmed projectile points and manos and metates.

In the Central Valley of California and adjacent foothills of the Sierra Nevada, aboriginal populations continued to expand between 6,500 and 4,500 years ago, with the possibility that Macro-Penutian-speaking arrivals (including Miwok, Yokuts and Nisenan) introduced more extensive use of bulbs and other plant foods, animal and fishing products more intensively processed with mortars and pestles, and perhaps the bow and arrow and associated small stemmed- and corner-notched projectile points. The peoples occupying the project area at the time of initial contact with European American populations were the Penutian-speaking Nisenan.

Historic Context

There is clear historic evidence that Spanish and Mexican expeditions and early fur trapping ventures visited the northern Sacramento Valley area, including the drainages of the Feather, Yuba, Bear, and American Rivers, during the early 19th century. However, the first major incursion by Euroamerican populations occurred during and just prior to the Gold Rush period. Trappers employed by the Hudson's Bay Company visited the region between 1830 and 1841. These early travelers helped scout the route for an overland trail from the Mississippi River to California. Later emigrants arrived via several early trails, including the California Emigrant Trail and the Carson Emigrant Trail.

In 1848, John Marshall discovered gold at Coloma, setting in motion a series of changes which would dramatically alter the face of California. Mining along virtually every stream within the vicinity of the project area was underway by 1950, including Slate Creek and its tributaries. Placer mining continued to yield large quantities of gold through the next several years, and by 1855 supporting industry in parts of El Dorado and surrounding counties included stores, transportation companies, saloons, toll roads and stage lines, foundries, lumber mills, and water companies. Continued exploration and limited mining operations continued through several decades of the 20th Century, activities which account for most if not all of the components which define historic site CA-ELD-241-H, the series of mining-related landscape modifications and features located within the 160-ac Rancheria property north of the present project area.

Transportation, ranching, agriculture, logging, and subsequently water storage and water diversion projects represent additional major historic themes for this area near Shingle Springs, resulting in construction of a wide range of structure and feature types, many of which remain intact or partially intact throughout this portion of El Dorado County.

Ethnography

The project area is located within territory which was occupied by the Nisenan (Wilson and Towne 1978:), Native American peoples who are also referred to as "Southern Maidu." These Penutian-speaking peoples occupied the drainages of the southern Feather River and Honcut Creek in the north, through Bear River and the Yuba and American River drainages in the south, extending from the crest of the Sierra Nevada westerly to the Sacramento River. The basic social unit for the numerous Nisenan tribelets which comprised the Nisenan peoples was the family, although the village may also be considered a social, as well as a political and economic, unit. Villages were frequently located on flats adjoining streams, and were inhabited mainly in the winter as it was usually necessary to go out into the hills and higher elevation zones to establish temporary camps during food gathering seasons (i.e., spring, summer and fall). Villages typically consisted of a series of bark houses, numbering from four or five to several dozen or more in

larger villages, each house containing a single family of from three to seven people. Larger villages, with from twelve to fifteen or more houses, might also contain an earth lodge.

Economic life for the Nisenan revolved around hunting, fishing and the collecting of plant foods. The collection and processing of these various food resources was accomplished with a wide variety of wooden, bone and stone artifacts. These people were very sophisticated in terms of their knowledge of the uses of local animals and plants, and of the availability of raw material sources which could be used in manufacturing an immense array of primary and secondary tools and implements. Based on the results of previous survey work within the general and immediate project area, a range of site types is known to be present within the general vicinity, including habitation areas with and without associated middens, bedrock milling stations, lithic scatters, occasional petroglyphs, trails, mortuary sites usually associated with major habitation areas, and isolated artifacts.

Clearly, it was not expected that all of these site types would be present within the project area, but rather that these represent the most likely *types* to be present if any sites were identified at all.

5.10.3 Regulatory Setting

Since the project will involve a break in access to Highway 50 and construction work within the Highway 50 right-of-way, studies must be undertaken in consultation with the Caltrans. As well, the Proposed Project is being overseen by the BIA, as a result, the Proposed Project must therefore conform with federal and state guidelines for assessing the effects of an “undertaking” to cultural resources, Section 106 of the National Historic Preservation Act (NHPA) and its implementing regulations (36 CFR Part 800), Section 2(b) of Executive Order 11593, Section 101(b)(4) of the National Environmental Policy Act, the Archaeological Resources Protection Act, the Native American Grave Protection and Repatriation Act of 1990, California Environmental Quality Act of 1970, Public Resources Code, Section 21000, et seq. (CEQA), California Administrative Code, Section 15000 et seq. (Guidelines, a amended October 1998).

5.10.4 Impacts And Mitigation Measures

Significance Criteria

Cultural resource preservation and criteria for the identification of important resources focus on a cultural property’s research potential, uniqueness and integrity (relative to other cultural resources similar in kind). A resource is considered to have integrity when it retains sufficient physical character to convey to the viewer an association with prehistoric or historic patterns, persons, designs, or technologies. A significant property must have the potential to contribute

important information towards scholarly research, which can then be conveyed to the general public.

The quality of significance in American history, architecture, archaeology, and culture is present in districts, sites, buildings, structures, and objects that possess integrity of location, design, setting, materials, workmanship, feeling, and association. In this area of California, archaeological findings are often associated with Native American habitation, such as food processing sites, village sites and encampments, and burial grounds.

An important archaeological resource is one that meets one or more of the following criteria:

- Is associated with events that have made a significant contribution to the broad patterns of California's history and cultural heritage;
- Is associated with the lives of persons important in our past;
- Embodies the distinctive characteristics of a type, period, region, or method of construction, or represents the work of an important creative individual, or possesses high artistic values; or
- Has yielded, or may be likely to yield, information important in prehistory or history.

Methodology

Records Searched

Prior to conducting the field survey, the official El Dorado County archaeological records maintained by the North Central Information Center at CSU-Sacramento were examined for any existing recorded prehistoric or historic sites (Information Center File #'s ELD-99-86 [conducted 1999] and ELD-00-98 [conducted 2000]), with the following results:

North Central Information Center Records: A small portion of the project area within the Highway 50 road right-of-way has been subjected to formal archaeological survey (Report by Fernandez and Fryman 1999).

Other Sources Consulted: In addition, to examining the official records of El Dorado County as maintained by the North Central Information Center at CSU-Sacramento, the following sources were consulted:

- The National Register of Historic Places (1986, Supplements to 12/00);

- The California Inventory of Historic Resources (State of California 1976);
- The California Historical Landmarks (State of California 1990);
- 1870 GLO Plat; El Dorado County Map 1895;
- Mr. Jeff Murray, Shingle Springs Rancheria, representing Nisenan;
- Mr. Sam Starkey, Auburn Rancheria, representing Nisenan;
- The El Dorado County Historical Museum, Placerville;
- The El Dorado County Pioneer Cemeteries Commission, Cameron Park;
- The Native American Heritage Commission re. sacred lands files; and,
- Existing published and unpublished documents relevant to prehistory, ethnography, and early historic developments in the vicinity.

Research Approach

Compliance with Section 106 of the NHPA requires completion of projects in conformity with the standards, guidelines, and principles in the *Advisory Council's Treatment of Archaeological Properties: A Handbook* (1980), and *Archaeology and Historic Preservation: Secretary of the Interior's Standards and Guidelines* (1983) (Jensen & Associates, 2000). Based on these several publications, the following specific tasks were performed:

- Conduct a records search at the North Central California Information Center of the California Historical Resources Information System at CSU-Sacramento to determine if any previously recorded sites exist within the project area, and consult with Native American representatives and the Native American Heritage Commission. Collectively, the goals of the records search and consultation are to determine (a) the extent and distribution of previous archaeological surveys, (b) the locations of known archaeological sites, historic resources, traditional cultural properties, sacred lands and recorded archaeological districts within or adjacent to the project area, and (c) the relationships between known sites and environmental variables. This step is designed to ensure that, during field survey work, all properties considered eligible or potentially eligible for inclusion on the National Register are discovered, correctly identified, and properly interpreted.

- Conduct a pedestrian survey of the project area in order to identify and locate any previously unidentified cultural resources. Based on map review and the results of previous studies in the immediate vicinity, a complete coverage, but variable-intensity survey was considered appropriate.

  The purpose of the pedestrian survey is to ensure that previously recorded sites which may have been identified during the records search are re-located. For previously undocumented

sites discovered, the field survey will involve documenting site size, location, and general type. For both previously identified and newly identified sites, the level of field work will be sufficient to recommend measures designed to avoid, minimize or mitigate potential adverse effects of the proposed undertaking.

- Upon completion of the records search and the field survey, prepare an inventory survey report which identifies prehistoric and historic archaeological sites within the property and which could be affected by the undertaking, recommend which if any such sites might be eligible for inclusion on the National Register, and outline treatment commensurate with the significance or importance of the identified sites.

The remainder of the present document constitutes the Final Inventory Survey Report for this project, detailing the results of the records search and field work, and providing recommendations for treatment of sites which might be affected by the undertaking. All field work procedures followed guidelines provided by the State Historic Preservation Office (Sacramento) and are in conformity with accepted professional standards.

Survey Strategy

In view of variable sensitivity zones within the project area, a mixed survey strategy was employed. Intensive-level field survey was undertaken within the land area located between the Rancheria to the north and Highway 50 to the south. Within this area, which has been partially developed for residential use, survey transects were maintained at approximate 45-60 feet (15-20 meter) intervals. Much of the native vegetation has been removed from this area, and ground surface visibility was not obstructed.

Within the existing highway right-of-way, which includes heavily disturbed lands, a zig-zag transect pattern was walked along both sides of the roadway, between the edge of the roadway and highway fencing. In this area, virtually all of the native vegetation has been removed, and highway maintenance has kept re-growth to a minimum. Ground surface visibility was unobstructed.

In searching for cultural resources, the surveyors took into account the results of background research, and were alert for any unusual contours, soil changes, distinctive vegetation patterns, exotic materials, artifacts, feature or feature remnants and other possible markers of cultural sites.

Field Work

Field work for the present project was undertaken on October 25, 2000, and December 12, 2000 by Sean M. Jensen and Peter M. Jensen. No special problems were encountered during the course of field work, and all survey objectives are considered to have been satisfactorily achieved.

Impact/ Mitigation

Impact 5.10-1 Discovery of Prehistoric, Archaeological and Paleontological Resources

AA Under the No Project/Action Alternative, the interchange would not be constructed, therefore, ***no impact*** upon prehistoric, archaeological, or paleontological resources would occur on or around the project site.

AB, AC Construction of the proposed on- and off-ramps for Flyover Interchange Design Alternative and Diamond Interchange Design Alternative would require hillside excavation and grading which could result in the possibility that some prehistoric, archaeological, or paleontological resources could be uncovered. No prehistoric or historic-period sites or features have been formally recorded within or adjacent to the project area. Several sites have been identified within the vicinity, but none of these previously recorded sites will be affected by the interchange project. Additionally, no evidence of prehistoric presence was identified during the pedestrian survey. These negative results are attributed in part to the absence of a suitable surface water source within the project area, and to the extensive disturbance to which most of the project area has been subjected. ***The Flyover Interchange Design Alternative and the Diamond Interchange Design Alternative have the potential to uncover undiscovered prehistoric, archaeological, or paleontological resources.***

Mitigation 5.10-1 Discovery of Prehistoric, Archaeological and Paleontological Resources

The following mitigation will assure that the proposed project will result is a ***less than significant impact***.

(A) In the event that any prehistoric, archaeological, or paleontological resources are discovered during construction-related activities, work near the resources shall be halted and a qualified archaeologist or paleontologist shall be commissioned to assess the significance of the find. If any find were determined to be significant, by the qualified

archaeologist or paleontologist, then the qualified archaeologist and/or paleontologist would meet with Caltrans and BIA officials to determine the appropriate course of action.

Impact 5.10-2 Disturbance to Historic Cultural Material

AA Under the No Project/Action Alternative, the interchange would not be constructed, therefore, no impact upon cultural resources would occur on or around the project site. The No Project/Action Alternative will result in ***no impact*** to the environment as related to historic cultural material.

AB, AC Construction of the proposed on- and off-ramps for fly-over interchange design alternative and diamond interchange design alternative would require disturbance to the ground surface ranges within the project area. A portion of the 5-acre parcel between Highway 50 and the Rancheria has been partially developed for residential use. An existing house and associated outbuildings are located within this location, however were constructed in 1982 and are not considered historic.

No evidence of demonstrably historic-period homesteading, occupation, ranch use, mining or other activities was observed within the project area. Again, these negative results may be attributed at least in part to the extensive disturbance and prior development to which most of the project area has been subjected. ***The Flyover Interchange Design Alternative and the Diamond Interchange Design Alternative are not expected to result in a significant impact to historic cultural material.***

Mitigation 5.10-2 Disturbance to Historic Cultural Material

None Required.

Impact 5.10-3 Cumulative Cultural Resource Impacts

AA Under the No Project/Action Alternative, the interchange would not be constructed, therefore, no cumulative impact upon cultural resources would occur on or around the project site. ***No impact*** will result under the No Project/Action Alternative.

AB, AC The analysis conducted for the proposed interchange concluded that no prehistoric archaeological or historic period sites or features have been formally recorded within or adjacent to the project area. Additionally, no evidence of prehistoric presence was identified during the survey. Lastly, the analysis concluded that the

project would not result in an impact to historic cultural material. Therefore, the only effect potentially associated with the proposed interchange is the loss of undiscovered artifacts. Implementation of Mitigation 5.10-1(A) will assure that the proposed interchange project will not result in a cumulatively considerable impact to cultural resources. ***The Flyover Interchange Design Alternative and the Diamond Interchange Design Alternative* may *contribute to the cumulative loss of previously undiscovered artifacts.***

Mitigation 5.10-3 Cumulative Cultural Resource Impacts

The following mitigation will assure that the proposed project will result is a ***less than significant impact***.

(A) Implement Mitigation 5.10-1(A).

5.11 Hazardous Materials

5.11.1 Introduction

This chapter addresses the hazards and hazardous materials issues related to the project site and that have been identified in the surrounding area. A material is considered hazardous if it appears on a list of hazardous materials prepared by a federal, state, or local agency, or if it has characteristics defined as hazardous by such an agency. Factors that influence the health effects of exposure to a hazardous material include the dose to which the person is exposed, the frequency of exposure, the exposure pathway, and individual susceptibility.

5.11.2 Environmental Setting

Existing Conditions

A Phase I Environmental Site Assessment was produced in conformance with the scope and limitations of American Society of Testing and Materials (ASTM) Standard Practice E1527, which specifies the appropriate inquiry requirement for the innocent landowner defense under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) (**Appendix K**). The Phase I Environmental Site Assessment included historical records review, a database search, and site reconnaissance.

As a part of the Phase I Assessment, governmental regulatory agency databases as listed in **Table 5.11-1**, were searched for listings up to 1.25 mile from the project site. The database search report provided by *VISTA Information Solutions, Inc.* is attached to the Phase I report. The database search covered the Project site, as well as surrounding lands anywhere from 3/8 mile to 1.25 mile from the site, depending on the database. Included in the VISTA database search report was a list of "unmapped sites", which was reviewed for properties that may be located within the search radius specified for each governmental database.

The Phase I Environmental Site Assessment conducted for the project site did not identify any existing hazardous material releases on or adjacent to the project site. The Assessment concluded that “Based only on the information reviewed, the site reconnaissance and interviews, this assessment has revealed no evidence of recognized environmental conditions in connection with the subject property.”

Table 5.11-1 Databases Searched in Site Assessment

Database	Type of Record	Agency
NPL	National Priority List	U.S. EPA
CORRACTS[1]	RCRA[2] Corrective Actions	U.S. EPA
SPL	State equivalent priority	STATE
SCL	State equivalent CERCLIS[3] List	STATE
CERCLIS/ NFRAP[4]	Sites currently or formerly under review by US EPA	U.S. EPA
TSD	RCRA permitted treatment, storage, disposal facilities	U.S. EPA
LUST	Leaking Underground Storage Tanks	State Regulatory Commission
SWLF	Permitted as solid waste landfills, incinerators or transfer stations	State/ Regional Regulatory Commission
DEED RSTR	Sites with deed restrictions	STATE
CORTESE[5]	State index of properties with hazardous waste	STATE
TOXIC PITS	Toxic pits cleanup facilities	STATE
WATER WELLS	Federal and State Drinking Water Sources	USGS/ STATE
RCRA Viol	RCRA violations/ enforcement actions	U.S. EPA
TRIS	Toxic Release Inventory Database	U.S. EPA
ERNS	Emergency Response Notification System of Spills	U.S. EPA
GNRTR	RCRA registered small or large generators of hazardous waste	U.S. EPA
SPILLS	State spills list	STATE
UST/AST	Registered underground or aboveground storage tanks	STATE

Source: Vista Report, 2000
[1]CORRACTS:Corrective Action Report System, an EPA database of corrective actions taken at a RCRA Regulated site. (also known as CARS)
[2]RCRA:Resource Conservation and Recovery Act
[3]CERCLIS:Comprehensive Environmental Response, Compensation & Liability Information System
[4]NFRAP:No Further Remedial Action Planned (archived CERCLIS sites)
[5]CORTESE:Based on input from 14 state databases

Asbestos

El Dorado County is located in the Sierra foothills. The geology of the Sierra foothills contains an abundance of serpentine rock. Serpentine rock often contains naturally-occurring asbestos. The project site is situated within a north-trending, relatively narrow zone of chaotically intermixed rocks known as the Sierra Foothills Melange Belt. These rocks include what once was an ancient sea floor. Within this belt, especially along the Bear Mountain fault Zone, the metamorphic rocks are intermixed with rocks containing serpentine called serpentinite. Serpentine is a group of common rock-forming minerals that are derived from magnesium-rich silicate minerals in igneous and metamorphic rocks.

Serpentine rock is abundant in the Sierra foothills and has been identified in particular bedrock formations in El Dorado County. The project site is located in an area identified as containing both ultramafic rocks and non-ultramafic rocks on a California Department of Conservation, Division of Mines and Geology map of western El Dorado County (DMG, 1998). Ultramafic rocks are defined as areas containing serpentine rock and related rock types, and non-ultramafic rocks are defined as areas that may contain ultramafic rocks too small to show on the map or not included on the source map (DMB, 1998). Subsurface bedrock in the vicinity of the project site may not be shown on available geologic maps because younger artificial fill and alluvial deposits may cover it. Boulders of serpentinite were observed outcropping on property south of Highway 50. It is therefore uncertain as to the presence or extent of serpentinite bedrock at the project site.

Asbestos minerals, including chrysotile and tremolite, can also occur naturally in serpentine rock, especially that of the Franciscan Formation in the Coast Ranges. Asbestos presents an inhalation hazard because the fibers can enter the lungs and in some cases result in lung cancer, asbestosis and mesothelioma. Levels and types of asbestos minerals vary with the rock and with location: some serpentinite may not contain harmful asbestos while others may contain a high percentage. Asbestos fibers are potentially harmful when they are airborne, therefore, asbestos sources that are friable and pulverized are considered more of a health risk than solid, non-friable sources. For example, a boulder of serpentinite would represent more of a potential asbestos hazard if it were crushed and became friable through mechanical means than if it was undisturbed in an outcrop.

Fire Hazard

Wildland fires are considered a hazard in areas of El Dorado County. The project site is covered with grasses, chamise scrub and oak trees. The project site is located within an area of moderate to high fire hazard (Figure V-4-2, Wildland Fire Hazards, El Dorado County General Plan EA, 1994).

5.11.3 Regulatory Setting

Hazardous wastes are hazardous materials that no longer have practical use, such as substances that have been discarded, discharged, spilled, contaminated, or are being stored prior to proper disposal. Hazardous materials and hazardous wastes are classified according to four properties: toxic, ignitable, corrosive, and reactive (CCR, Title 22, Chapter 11, Article 3). Toxicity, ignitability, corrosivity, and reactivity are defined in the CCR, Title 22, Sections 66261.20-66261.24.

The California Code of Regulations (CCR) defines a hazardous material as a substance that, because of physical or chemical properties, quantity, concentration, or other characteristics, may either (1) cause an increase in mortality or an increase in serious, irreversible, or incapacitating, illness; or (2) pose a substantial present or potential hazard to human health or environment when improperly treated, stored, transported or disposed of, or otherwise managed (CCR, Title 22, Division 4.5, Chapter 10, Article 2, Section 66260.10).

Hazardous materials are subject to numerous laws and regulations at all level of government. Most hazardous materials regulation and enforcement in the El Dorado County is managed by the El Dorado County Environmental Management Department. However, large cases of hazardous materials contamination or violations are handled by the California Regional Water Quality Control Board and the California Department of Toxic Substances Control. It is not at all uncommon for other agencies to become involved when issues of hazardous materials arise such as the El Dorado County Air Pollution Control District in its regulation of asbestos hazard dust and both the federal and state OSHA in the preparation of hazardous materials remediation site safety plans intended to protect the health of construction and contamination remediation workers. In addition, the El Dorado County Fire Protection District is responsible for hazardous materials emergency first response where a hazardous materials incident immanently threatens life or property.

Federal

Federal regulatory agencies include the U.S. EPA, OSHA, the Nuclear Regulatory Commission (NRC), the Department of Transportation (DOT) and the National Institute of Health (NIH). The following represent federal laws and guidelines governing hazardous substances:

- Federal Water Pollution Control Act
- Clean Air Act
- Occupational Safety and Health Act
- Federal Insecticide, Fungicide, and Rodenticide Act

- Comprehensive Environmental Response Compensation and Liability Act
- Guidelines for Carcinogens and Biohazards
- Superfund Amendments and Reauthorization Act Title III
- Resource Conservation and Recovery Act
- Safe Drinking Water Act
- Toxic Substances Control Act

At the federal level, the principal agency regulating the generation, transport and disposal of hazardous substances is the U.S. EPA, under the authority of Resource Conservation and Recovery Act (RCRA). The U.S. EPA regulates hazardous substance sites under the Comprehensive Environmental Response Compensation and Liability Act (CERCLA). Applicable federal regulations are contained primarily in Titles 29, 40, and 49 of the Code of Federal Regulations (CFR).

Hazardous Substances Handling Requirements

The RCRA established a federal hazardous substance "cradle-to-grave" regulatory program that is administered by the U.S. EPA. Under RCRA, the U.S. EPA regulates the generation, transportation, treatment, storage and disposal of hazardous substances. The RCRA was amended in 1984 by the Hazardous and Solid Waste Act (HSWA), which affirmed and extended the "cradle-to-grave" system of regulating hazardous substances. The HSWA specifically prohibits the use of certain techniques for the disposal of some hazardous substances. Under the RCRA, individual states may implement their own hazardous substance management programs as long as they are consistent with, and at least as strict as, RCRA. The U.S. EPA must approve state programs intended to implement the RCRA requirements.

Hazardous Waste Sites

The CERCLA, commonly referred to as Superfund, was enacted on December 11, 1980. The purpose of CERCLA was to provide authorities the ability to respond to uncontrolled releases of hazardous substances from inactive hazardous waste sites that endanger public health and the environment. CERCLA established prohibitions and requirements concerning closed and abandoned hazardous waste sites, provided for liability of persons responsible for releases of hazardous waste at such sites, and established a trust fund to provide for cleanup when no responsible party could be identified. In addition, CERCLA provided for the revision and republishing of the National Contingency Plan (NCP) that provides the guidelines and procedures needed to respond to releases and threatened releases of hazardous substances,

pollutants, or contaminants. The NCP also provides for the National Priorities List, a list of national priorities among releases or threatened releases throughout the United States for the purpose of taking remedial action.

The Superfund Amendments and Reauthorization Act (SARA) amended CERCLA on October 17, 1986. This amendment increased the size of the Hazardous Response Trust Fund, expanded U.S. EPA's response authority, strengthened enforcement activities at Superfund sites; and broadened the application of the law to include federal facilities. In addition, new provisions were added to the law that dealt with emergency planning and community right to know. SARA also required U.S. EPA to revise the Hazard Ranking System to ensure that the HRS accurately assesses the relative degree of risk to human health and the environment posed by sites and facilities subject to review for listing on the NPL.

Hazardous Substances Worker Safety Requirements

The Federal Occupational Safety and Health Administration (Fed/OSHA) is the agency responsible for ensuring worker safety. Fed/OSHA sets federal standards for implementation of training in the work place, exposure limits, and safety procedures in the handling of hazardous substances (as well as other hazards). Fed/OSHA also establishes criteria by which each state can implement its own health and safety program.

Hazardous Materials Transportation

The DOT regulates the interstate transport of hazardous materials and wastes through implementation of the Hazardous Materials Transportation Act. This act specifies driver training requirements, load labeling procedures, and container design and safety specifications. Transporters of hazardous wastes must also meet the requirements of additional statutes such as RCRA.

State

The Cal/EPA and the Office of Emergency Services (OES) of the State of California establish rules governing the use of hazardous substances. The State Water Resources Control Board (SWRCB) has primary responsibility to protect water quality and supply.

The Cal/EPA was created in 1991 to better coordinate state environmental programs, reduce administrative duplication, and address the greatest environmental and health risks. Cal/EPA unifies the state's environmental authority under a single accountable, Cabinet-level agency. The Secretary for Environmental Protection oversees the following agencies: Air Resources Board,

Integrated Waste Management Board, Department of Pesticide Regulation, SWRCB, Department of Toxic Substances Control (DTSC), and OES.

Hazardous Substances Handling Requirements

Within Cal/EPA, the DTSC has primary regulatory responsibility, with delegation of enforcement to local jurisdictions that enter into agreements with the state agency, for the generation, transport and disposal of hazardous substances under the authority of the Hazardous Waste Control Law (HWCL). Regulations implementing the HWCL list approximately 791 hazardous chemicals and 20 to 30 more common substances that may be hazardous; establish criteria for identifying, packaging and labeling hazardous substances; prescribe management of hazardous substances; establish permit requirements for hazardous substances treatment, storage, disposal and transportation; and identify hazardous substances that cannot be deposited in landfills.

Under both the RCRA and the HWCL, the generator of a hazardous substance must complete a manifest that accompanies the waste from the point of generation to the ultimate treatment, storage or disposal location. The manifest describes the waste, its intended destination, and other regulatory information about the waste. Copies must be filed with the DTSC. Generators must also match copies of waste manifests with receipts from the treatment, storage or disposal facility to which it sends waste.

Hazardous Substances Worker Safety Requirements

The California Occupational Safety and Health Administration (Cal/OSHA) assumes primary responsibility for developing and enforcing work place safety regulations within the State. Cal/OSHA standards are more stringent than federal regulations. Cal/OSHA regulations concerning the use of hazardous substances include requirements for safety training, availability of safety equipment, hazardous substances exposure warnings, and emergency action and fire prevention plan preparation. Cal/OSHA enforces the hazard communication program regulations, which include provisions for identifying and labeling hazardous substances, describing the hazards of chemicals, and documenting employee training programs.

Both federal and State laws include special provisions for hazard communication to employees who work with and/or encounter hazardous materials and wastes. The training must include safe methods for handling hazardous substances, an explanation of Material Safety Data Sheets, use of emergency response equipment, implementation of an emergency response plan and use of personal protective equipment.

Groundwater Regulatory Background

Acting through the California Regional Water Quality Control Board (RWQCB), the SWRCB regulates surface and groundwater quality pursuant to the Porter-Cologne Water Quality Act, the federal Clean Water Act, and the Underground Tank Law. Under these laws, RWQCB is authorized to supervise the cleanup of hazardous wastes sites referred to it by local agencies in those situations where water quality may be affected.

Depending on the nature of contamination, the lead agency responsible for the regulation of hazardous materials at the site can be the DTSC, RWQCB, or both. DTSC evaluates contaminated sites to ascertain risks to human health and the environment. Sites can be ranked by DTSC or referred for evaluation by the RWQCB.

The RWQCB is responsible for overseeing the discharge of water (from dewatering during construction activities) to surface waters. Cal/EPA (DTSC) and Cal/OSHA are the agencies that are responsible for overseeing that appropriate measures are taken to protect workers from exposure to potential groundwater contaminants.

Hazardous Materials Transport

California law requires that Hazardous Waste (as defined in California Health and Safety Code Division 20, Chapter 6.5) be transported by a California registered hazardous waste transporter that meets specific registration requirements. The requirements include possession of a valid Hazardous Waste Transporter Registration, proof of public liability insurance which includes coverage for environmental restoration, and compliance with California Vehicle Code registration regulations required for vehicle and driver licensing. A complete list of requirements can be found in Title 22 CCR, Chapter 13.

State agencies with primary responsibility for enforcing federal and state regulations and responding to hazardous materials transportation emergencies are the California Highway Patrol (CHP) and the California Department of Transportation (Caltrans). Together, these agencies determine container types used and license hazardous waste haulers for hazardous waste transportation on public roads.

Local

The Unified Hazardous Waste and Hazardous Management Regulatory Program (SB 1082, 1993) is a state and local effort to consolidate, coordinate, and make consistent existing programs regulating hazardous waste and hazardous materials management. Cal/EPA adopted implementing regulations for the Unified Program (CCR, Title 27, Division 1, Subdivision 4,

Chapter 1) in January 1996. The Unified Program is implemented at the local level by Certified Unified Program Agencies (CUPAs).

The El Dorado County Environmental Management Department (EDCEMD) is the CUPA for cities and unincorporated areas within El Dorado County. Through their Solid Waste & Hazardous Materials Division, the EDCEMD regulates the use, storage and disposal of hazardous materials by issuing permits, inspecting facilities, and investigating complaints. The EDCEMD issues permits for installation and removal of underground storage tanks. The EDCEMD inspects businesses for compliance with the Hazardous Waste Control Act. The EDCEMD also requires that businesses who handle hazardous materials and hazardous wastes to submit a Hazardous Materials Plan (HMP). The HMP includes an inventory of hazardous materials and hazardous wastes, as well as an emergency response to incidents involving those hazardous materials and wastes.

Under a contract with the SWRCB, the EDCEMD conducts the Local Oversight Program to oversee the abatement and cleanup of releases of hazardous substances from underground storage tanks in El Dorado County that do not involve chemical releases to water. The RWQCB is the lead agency for chemical releases to water throughout the County.

Hazardous Waste Management Plan

Assembly Bill 2948 (Tanner, 1986) established procedures for the preparation of a County Hazardous Waste Management Plan (HWMP). The HWMP is intended to serve as the primary planning document for hazardous waste management within a County, and contains goals, policies and recommended programs for the management, recycling and disposal of hazardous wastes. The HWMP principally governs the coordination and planning of hazardous waste disposal capacity between the County and state. The California DHS must give its approval to the plan before the document becomes effective. The El Dorado County HWMP serves as the implementation program for management hazardous waste in order to protect the health, safety, and property of residents.

Emergency Response

California has developed an Emergency Response Plan to coordinate emergency services provided by federal, state, and local government and private agencies. Response to hazardous materials incidents is one part of this plan. The plan is administered by the state Office of Emergency Services (OES), which coordinates the responses of other agencies including Cal/EPA, the California Highway Patrol, California Department of Fish and Game (CDFG), the

Regional Water Quality Control Board (RWQCB), the County Environmental Management Department, and the Fire Department.

The EDCEMD staff responds to hazardous material spills and releases. The Solid Waste & Hazardous Materials Division of the EDCEMD is responsible for after hours on-call support for hazardous material emergencies. The El Dorado County Fire Protection District is also qualified as first response for hazardous materials releases.

California Department Of Transportation (Caltrans)

Construction Specifications

The following is hazardous materials information and requirements as specified by Caltrans for their project development process. These requirements would also apply to the project alternatives. The Caltrans Environmental Handbook (Volume 1, 1995) notes that it is the policy of Caltrans that generally, every project which includes the purchase of new right of way, excavation, and/or structure demolition or modification will require at least an Initial Site Assessment (ISA) to determine if there is any known or potential hazardous waste within the project limits. The Caltrans Environmental Office coordinates this activity and determines the responsibility for completing the ISA.

Chapter 18 (Hazardous Waste) of the Caltrans Project Development Procedures Manual contains policies regarding hazardous waste and the procedures to be followed in transportation related projects to ensure that hazardous waste identification and cleanup is addressed.

El Dorado County General Plans, Policies, And Ordinances

Hazardous Materials

The El Dorado County General Plan includes the following specific goals and policies relative to hazardous materials that are applicable to the Proposed Project and alternatives:

Goal 6.6: Management of Hazardous Materials

Recognize and reduce the threats to public health and the environment posed by the use, storage, manufacture, transport, release and disposal of hazardous materials.

> Objective 6.6.1: Regulation of Hazardous Materials
>
> Regulate the use, storage, manufacture, transport and disposal of hazardous materials in accordance with State and Federal regulations.

Policy 6.6.1.1

The Hazardous Waste Management Plan shall serve as the implementation program for management of hazardous waste in order to protect the health, safety, property of residents and visitors, and to minimize environmental degradation while maintaining economic viability.

Policy 6.6.1.2

Prior to the approval of any subdivision of land or issuing of a building permit, it shall be determined whether the subdivision or parcel is located on a contaminated site included in a list on file with the Environmental Management Department as provided by the State of California. If contamination is found to exist, it shall be corrected prior to issuance of a new land use entitlement or building permit.

El Dorado County also has an ordinance (Chapter 8.38), in place regarding hazardous materials which includes requirements for hazardous materials management, hazardous materials incident response, hazardous materials inspections, and permit requirements.

Asbestos

The U.S. EPA has declared asbestos to be a hazardous air pollutant under the CAA and has issued a National Emissions Standard for Hazardous Air Pollutants (NESHAP) that regulates the demolition and renovation of facilities containing asbestos. The NESHAP also imposes additional restrictions on asbestos waste disposal. In California, most of the State's air districts are delegated by U.S. EPA to implement the federal NESHAP requirements. The El Dorado County General Plan does not have any policies specific to asbestos. However, El Dorado County has an ordinance (Chapter 8.4.4) relative to protection from asbestos dust, which requires preparation of an Asbestos Hazard Dust Mitigation Plan prior to construction activities.

Fire Hazard

The El Dorado County General Plan includes the following specific goals and policies relative to fire safety that are applicable to the Proposed Project and alternatives:

Goal 6.2: Fire Hazards

Minimize fire hazards in both wildland and developed areas.

Objective 6.2.2: Limitations to Development

Regulate development in areas of high and very high fire hazard as designated by the California Department of Forestry and Fire Prevention Fire Hazard Severity Zone Maps.

Policy 6.2.2.1

Fire Hazard Severity Zone Maps shall be consulted in the review of all projects so that standards and mitigation measures appropriate to each hazard classification can be applied. Land use densities and intensities shall be determined by mitigation measures in areas designated as high or very high fire hazard.

5.11.4 Impacts And Mitigation Measures

Significance Criteria

A project would generally be considered to have a significant adverse environmental impact if it would create a potential public health hazard; involve the use, production, or disposal of materials that pose a hazard to people, animal or plant populations in the area affected; or if it would interfere with emergency response plans or emergency evacuation plans. For the purposes of this EIR/EA, the following significance criteria are used:

- Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials;
- 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;
- Be located on a site which is included on a list of hazardous materials sites compile pursuant to Government Code Section 65962.5 and, as a result, would create a significant hazard to the public or the environment;
- Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan;
- Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances or waste within one-quarter mile of an existing or proposed school;
- 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.

Methodology

Potential hazardous materials and public health impacts (primarily construction-related exposure) were evaluated. The project site and alternatives were evaluated for consistency with adopted plans and policies, and ordinances, as well as compliance with federal, state and local regulations relative to hazardous materials, asbestos and fire hazards.

Impact/ Mitigation

Impact 5.11-1 Exposure of Individuals to Contaminated Soil and/or Groundwater

AA No development will occur as a result of the No Project/Action Alternative. ***No impact*** will result under the No Project/Action Alternative.

AB, AC The Phase I Environmental Site Assessment completed for the project site did not identify any obvious signs of hazardous material contamination on the project site or adjacent properties. As a part of the Phase I Site Assessment federal, state, and regional governmental agency database searches were made for records of known sites of hazardous materials generation, storage or contamination. The database searches included the CORTESE database, which is the list of hazardous materials sites compiled pursuant to Government Code Section 65962.5, as required by CEQA. The project site was not listed on any of the databases that were searched. However, the potential does exist for previously unidentified soil and/or groundwater contamination to be encountered during project site preparation and construction activities. Encountering contaminated soil and groundwater without taking proper precautions could result in the exposure of construction workers and consequently result in associated significant adverse health effects. ***Therefore, in the event contaminated soil and/or groundwater is encountered during construction of the Flyover Interchange Design Alternative or the Diamond Interchange Alternative, proper precautions should be taken to minimize impacts to human health and the environment.***

Mitigation 5.11-1 Exposure of Individuals to Contaminated Soil and/or Groundwater

The following mitigation will assure that the proposed project will result is a ***less than significant impact***.

(A) If contaminated soil and/or groundwater is encountered or suspected contamination is encountered during project construction, work shall be halted in the area, and the type and extent of the contamination shall be identified. A qualified professional, in consultation with regulatory agencies (RWQCB, DTSC, and/or EDCEMD) shall then develop an appropriate method to remediate the contamination. If necessary, a remediation plan shall be implemented in conjunction with continued project construction.

Impact 5.11-2 Risk of Accidental Release of Hazardous Materials

AA No development will occur as a result of the No Project/Action Alternative. ***No impact*** will result under the No Project/Action Alternative.

AB, AC During grading and construction activities it is anticipated that limited quantities of miscellaneous hazardous substances, such as gasoline, diesel fuel, hydraulic fluid, solvents, oils, paints, etc. would be brought onto the site. Temporary bulk above-ground storage tanks, 55-gallon drums, sheds/trailers would likely be used by various contractors for fueling and maintenance purposes. As with any liquid and solid, during handling and transfer from one container to another, the potential for an accidental release exists. Depending on the relative hazard of the material, if a spill were to occur of significant quantity, the accidental release could pose both a hazard to construction employees as well as the environment. ***Therefore, proper precautions should be taken to minimize risks to human health or the environment during construction of the Flyover Interchange Design Alternative or the Diamond Interchange Design Alternative.***

Mitigation 5.11-2 Risk of Accidental Release of Hazardous Materials

The following mitigation will assure that the proposed project will result is a ***less than significant impact.***

(A) The project applicant shall ensure, through the enforcement of contractual obligations, that all contractors transport, store, and handle construction related hazardous materials in a manner consistent with relevant regulations and guidelines, including those recommended and enforced by the U.S. Department of Transportation, RWQCB, EDCEMD, and the El Dorado County Fire Protection District. The project applicant shall also ensure that all contractors immediately control the source of any leak and immediately contain any spill utilizing appropriate spill containment and countermeasures. If required by any regulatory agency, contaminated media shall be collected and disposed of at an off-site facility approved to accept such media. In addition, all precautions required by the RWQCB issued NPDES construction activity storm water permits will be taken to ensure that no hazardous materials enter any storm drains or nearby waterways.

Impact 5.11-3 Exposure of Individuals to Asbestos Containing Dust

AA No development will occur as a result of the No Project/Action Alternative. ***No impact*** will result under the No Project/Action Alternative.

AB, AC Asbestos is the name for a group of naturally occurring silicate minerals. When serpentine rock is broken or crushed, asbestos may be released from the rock and may become airborne for long periods of time, causing a potential health hazard. ***Therefore, without mitigation the Flyover Interchange Design Alternative and the Diamond Interchange Design Alternative may result in a significant impact to human health and the environment.***

Mitigation 5.11-3 Exposure of Individuals to Asbestos Containing Dust

The following mitigation will assure that the proposed project will result is a ***less than significant impact***.

(A) Implement Mitigation 5.5-2

Impact 5.11-4 Exposure of Individuals to Wildland Fires

AA No development will occur as a result of the No Project/Action Alternative. ***Therefore, the No Project/Action Alternative is not expected to result in a significant impact to the environment.***

AB, AC Wildland fires present a serious safety issue in the area. Construction of the Proposed Project may introduce potential sources for fire. During construction, equipment and vehicles may come in contact with wildland areas and accidentally spark and ignite vegetation. The use of power tools and acetylene torches may also increase the risk of fire hazard. This risk is similar to that found at other construction sites. ***Therefore, without mitigation the Flyover Interchange Design Alternative and the Diamond Interchange Design Alternative may result in a significant impact to human health and the environment.***

Mitigation 5.11-4 Exposure of Individuals to Wildland Fires

The following mitigation will assure that the proposed project will result is a ***less than significant impact***.

(A) The project applicant will ensure, through the enforcement of contractual obligations, that during construction, staging areas, welding areas, or areas

slated for development using spark-producing equipment shall be cleared of dried vegetation or other materials that could serve as fire fuel. To the extent feasible, the contractor shall keep these areas clear of combustible materials in order to maintain a firebreak. Any construction equipment that normally includes a spark arrester shall be equipped with an arrester in good working order. This includes, but is not limited to, vehicles, heavy equipment, and chainsaws.

Impact 5.11-5 Cumulative Impacts to Hazardous Materials

AA The No Project/Action Alternative will not contribute to cumulative Hazardous Materials impacts. ***No impact*** will result under the No Project/Action Alternative.

AB, AC There are no significant cumulative impacts related to hazardous materials. Therefore, the proposed interchange project will not add to cumulative impacts concerning hazardous materials. ***Therefore, the proposed interchange project will not add to cumulative impacts concerning hazardous materials.***

Mitigation 5.11-5 Cumulative Impacts to Hazardous Materials

None required.

5.12 Water Quality

5.12.1 Introduction

The Water Quality section of the EIR analyzes the potential short-term, long-term, and cumulative impacts resulting from the construction and operation of the Project and alternatives. The water quality discussion will analyze the water quality conditions in the proposed Shingle Springs Interchange region.

5.12.2 Environmental Setting

Climate

The average annual precipitation for the Shingle Springs area is approximately 34 inches (86.4 centimeters) per year. The 100-year, 6-hour and 24-hour rainfall intensities are 3.2 inches (8.1 centimeters) and 6.5 inches (16.5 centimeters), respectively (El Dorado County, 1995). For the 25-year return period, rainfall intensities are 2.75 inches (7.0 centimeters) for the 6-hour duration and 5.4 inches (13.7 centimeters) for the 24-hour duration. Summers are hot and dry, and winters are cool and moist. A large majority of the annual precipitation falls between the months of November and April. Rainfall increases rapidly with elevation due to the orographic effect as the atmosphere rises and cools as it climbs over Sierra Nevada Mountains. Within 20 miles, annual rainfall can increase from 15 inches (38.1 centimeters) to 40 inches (101.6 centimeters) or more. This rainfall pattern is predictable and usually follows storm durations of 12- 24 hours. Within these total storm durations, there can be periods of more intense short duration rainfall, particularly as the main cold front approaches. Summer precipitation is rare, usually caused by monsoonal moisture from either the Gulf of Mexico or Gulf of California. While these summer monsoons may bring thunderstorms to the higher elevations along the crest of the Sierras, the lower elevations usually do not receive significant precipitation.

Surface Water and Drainage

The project area is located within the South Fork American River Basin (Hydrologic Unit 514.31) as identified within the Central Valley Regional Water Quality Control Board's *Water Quality Control Plan* (Basin Plan). More locally, the project area is located in the Slate Creek Watershed (**Figure 5.12-1**), a sub basin of the Weber Creek Watershed for which all water quality criteria in this report are assigned to. The Weber Creek Watershed contains the Tennessee Creek and the Slate Creek tributaries.

The project site is contained within an approximate 100-acre (40.5 hectare) drainage basin, and drains to two creeks. The first, Slate Creek, with its headwaters near the community of Diamond

Springs, travels southwest through the community of El Dorado before meeting up with a creek coming down Logtown ridge. It then travels westward before turning north approximately ½ mile (0.8 kilometers) west of Greenstone Mine. At this point Slate Creek travels north until meeting up with Dry Creek south of Green Valley Road. This journey is approximately 5 miles (8.0 kilometers) in length and drains an area of approximately 5,365 acres (2171.1 hectares) or 8.4 square miles (21.7 square kilometers) (**Figure 5.12-2**). The second channel, Tennessee Creek, is an intermittent tributary of Dry Creek.

The majority of runoff from the project site drains to Slate Creek. The project site contains four drainages; of these, three drain generally east to Slate Creek, while the other drains west toward Tennessee Creek.

These drainages primarily consist of vegetated swales that are dry most of the year and flow only during periods of precipitation and subsequent runoff. The drainage, which flows toward Tennessee Creek, enters one of four streams comprising the headwaters of Tennessee Creek. The other drainage channels intersect Slate Creek at an intermittent portion of the latter channel that flows only during periods of precipitation and groundwater discharge.

The project site contains three different soil types. These soils typically have low infiltration rates due to high rock content and rocky outcrops with limited soil layers. The local soils of the project area do not have as extensive rock content as detailed under the soil designations and also have substantial soil layers (Youngdahl & Associates, 1999). Therefore, infiltration rates are assumed to be higher than indicated in the Soil Conservation Service's soil survey (1974). Nearly all of the drainage basin is vegetated with either high grass or oak woodland.

Groundwater

The primary mechanism for water storage and movement on the project site is within the fracture and joint systems in the rocks. The occurrence and geometry of the fractures dictate the flow patterns within the rocks. Some rainfall will infiltrate the soil and be made available to plants and to the air for evapo-transpiration, and a portion will reach the lower permeability rock layer beneath the soils. At this point, the water will flow through the soil along the soil-rock boundary until a rock fracture conducts the water into the underlying rock or until the soil becomes too thin to support the flow, forming a seasonal spring.

Recharge to the system is dependent on rainfall characteristics, and the ability of the underlying rock to receive infiltration. Regionally, recharge rates range from 8% to 31%. The average amount of recharge to the project site can only be estimated within this range. Well data collected by Youngdahl and Associates indicates water detected at a depth of 209 feet (63.7

meters) near the project site. The deepest fractures were recorded at 551 feet (167.9 meters). Another well near the project site did not detect water until a depth of 385 feet (117.3 meters). This data suggests the aquifer to be semi-confined, ranging in thickness from less than 166 feet (50.6 meters) to a maximum of 342 feet (104.2 meters).

It is well understood that groundwater in this region resides in fractures in the underlying bedrock (Youngdahl and Associates, 1999). The availability of groundwater in these fractured rock formations is variable and can be quite limited. No well water is proposed for use in the Proposed Project.

Surface Water Quality

Land use largely affects surface water quality, with both point source and nonpoint-source discharges contributing contaminants to surface waters. The Proposed Project will consist of a freeway interchange, and hence the water quality will be largely guided by the characteristics of highway runoff.

Highway Runoff

Storm water runoff from highways is known as “highway runoff,” and contains a variety of characteristic contaminants. During storm events, rainwater first collects atmospheric pollutants and, upon surface impact, gathers roadway deposits. This runoff can be highly polluted, and negative impacts on receiving waters include sedimentation, eutrophication, and accumulation of pollutants in sediments and benthic organisms, and destruction of native species. Pollutants found in highway runoff are generally classified under six broad categories:

- suspended solids/particulates,
- oxygen-consuming constituents (e.g., BOD, COD),
- nutrients,
- heavy metals,
- trace organics, and
- microorganisms.

Typical concentrations of various constituents are presented in **Table 5.12-1**. Contaminants are deposited on paved areas and medians as a result of fuel combustion processes, lubrication system losses, tire and brake wear, transportation load losses, paint from infrastructure, and atmospheric fallout. Sources of specific contaminants are outlined in **Table 5.12-2**.

The impacts of highway runoff are highly site-specific, and depend upon the timing, frequency, and intensity of storm events, local air quality, and level of traffic activity. Of particular concern

See Figure 5.12-1

See Figure 5.12-2

is the runoff from "first flush" storm events, during which the first large storm of the season collects a relatively high concentration of contaminants. Also of concern is dry season runoff, which is also known to contain higher concentrations of contaminants.

Water Bodies Currently Impacted

No water quality data exists for the intermittent and ephemeral drainages on the project site, or for Slate and Tennessee Creeks. No impacted waterbodies are located in the Weber Creek

Table 5.12-1 Caltrans Storm Water Runoff Quality

Constituent	Unit	Average Storm Water Runoff Concentration from Highways*
Biological Oxygen Demand (BOD)	Mg/L	15.5
Chemical Oxygen Demand (COD)	Mg/L	86
pH (pH)	pH units	7.4
Temperature (Temp)	^{o}C	14
Total Dissolved Solids (TDS)	Mg/L	118
Total Suspended Solids (TSS)	Mg/L	160
Turbidity (Turb.)	NTU	60
Litter/trash (Trash)	Lb/acre(3)	20.5
Toxicity (Tox.)	% Survival	Insufficient monitoring data
Oil and Grease (O&G)	Mg/L	14.5
Metals (dissolved concentrations)		
Aluminum (Al)	ug/L	155
Arsenic (As)	ug/L	2.8
Cadmium (Cd)	ug/L	0.6
Chromium (Cr)	ug/L	3.1
Copper (Cu)	ug/L	15.8
Lead (Pb)	ug/L	7.3
Mercury (Hg)	ug/L	ND
Nickel (Ni)	ug/L	6.3
Selenium (Se)	ug/L	ND
Silver (Ag)	ug/L	0.6
Zinc (Zn)	ug/L	89.5
Nutrients		
Ammonia (NH_3)	Mg/L	1.8
Nitrate (NO_3)	Mg/L	1.6
Nitrite (NO_2)	Mg/L	0.2
Ortho-phosphate (P) (Ortho-P)	Mg/L	0.2
Total (Kjeldhl Nitrogen) (TKN)	Mg/L	2.9
Total Phosphorus (TP)	Mg/L	0.3
Microbiological		
Fecal Coliform	MPN/100/mL	8170
Total Coliform	MPN/100/mL	30,500
Pesticide		
Chlorpyrifos	ug/L	0.6
Diazinon	ug/L	0.7
Glyphosate	ug/L	39.6

Source: Caltrans, 2001
*Average based on 1997-1998 and 1998-1999 monitoring data.

Watershed as identified in the 1998 California Section 303(d) List and TMDL Priority Schedule (EPA, 2000), nor has the Central Valley Regional Water Quality Control Board (RWQCB) designated beneficial uses for water bodies within the watershed. The estimated approximate annual loading of various constituents in the Weber Creek Watershed, as calculated by the California Department of Transportation (Caltrans), is outlined in **Table 5.12-3**.

Table 5.12-2 Highway Runoff Constituents and Their Primary Sources

Constituent	Primary Source
Particulates	Pavement wear, vehicles, atmosphere, maintenance
Nitrogen, Phosphorus	Atmosphere, roadside fertilizer application
Lead	Auto exhaust, tire wear
Zinc	Tire wear, motor oil, grease
Iron	Auto body rust, steel highway structures, moving engine parts
Copper	Metal plating, bearing and bushing wear, moving engine parts, brake lining wear, fungicides and insecticides
Cadmium	Tire wear, insecticide application
Chromium	Metal plating, moving engine parts, brake lining wear
Nickel	Diesel fuel and gasoline (exhaust), lubricating oil, metal plating, bushing wear, brake lining wear, asphalt paving
Manganese	Moving engine parts
Sulphate	Roadway beds, fuel
Petroleum	Spills, leaks or blow-by of motor lubricants, antifreeze and hydraulic fluids, asphalt surface leachate
PCB's	Atmosheric deposition

Source: EPA, 1993 and Corrales et al. 1996

5.12.3 Regulatory Setting

A variety of federal, state, and local agencies have jurisdiction over the project site. Important agencies and statutory authorities relevant to water quality as it relates to the Proposed Project are outlined below.

Clean Water Act

The Clean Water Act (33 USC 1251-1376), as amended by the Water Quality Act of 1987, is the major federal legislation governing water quality. The objective of the CWA is "to restore and maintain the chemical, physical, and biological integrity of the Nation's waters." Important sections of the Act are as follows:

- Sections 303 and 304 provide for water quality standards, criteria, and guidelines.
- Section 401 requires an applicant for any federal permit 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.

Table 5.12-3 Estimated Annual Storm Water Runoff Loads in the Weber Creek Watershed

Constituent	Aggregate Load	Units
Acetone (VOC)	77	LBS/YR
Al-total	11	TONS/YR
Al-dissolved	450	LBS/YR
As-dissolved	8	LBS/YR
As-total	39	LBS/YR
B	180	LBS/YR
Ba	691	LBS/YR
Bis(2-ethylhexyl)phthalate	43	LBS/YR
BOD	32	TONS/YR
Ca	29	LBS/YR
Cd-dissolved	1	LBS/YR
Cd-total	5	LBS/YR
Chlorpyrifos	0	LBS/YR
Cl	12	TONS/YR
COD	277	TONS/YR
Cr-dissolved	12	LBS/YR
Cr-total	51	LBS/YR
Cu-dissolved	62	LBS/YR
Cu-total	201	LBS/YR
Cyanide	66	LBS/YR
Diazinon (OP Pesticide)	1	LBS/YR
F	2	TONS/YR
Fe-dissolved	743	LBS/YR
Fe-total	16	TONS/YR
Glyphosate	88	LBS/YR
K	6	TONS/YR
Mg	5	TONS/YR
Mn-total	1	LBS/YR
Na	12	TONS/YR
NH3-N	4	TONS/YR
Ni-dissolved	15	LBS/YR
Ni-total	56	LBS/YR
NO2-N	870	LBS/YR
NO3-N	3	TONS/YR
Oil & Grease	13	TONS/YR
P-dissolved	371	LBS/YR
P-total	1160	LBS/YR
Pb-dissolved	20	LBS/YR
Pb-total	462	LBS/YR
Sb-dissolved	8	LBS/YR
Sb-total	10	LBS/YR
SO4	21	TONS/YR
TDS	294	TONS/YR
TKN	5	TONS/YR
TOC	28	TONS/YR
TRPH	20	TONS/YR
TSS	194	TONS/YR
TVSS	153	TONS/YR
Zn-dissolved	377	LBS/YR
ZN-total	960	LBS/YR

Source: Caltrans, 2001b

- Section 402 establishes the National Pollutant Discharge Elimination System (NPDES), a permitting system for the discharge of any pollutant (except for dredge or fill material) into waters of the United States. This permit program is administered by RWQCB, and is discussed in detail below.
- 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 USACE.

Porter-Cologne Water Quality Act

The State of California's Porter-Cologne Water Quality Control Act (California Water Code Section 13000 et seq.) provides the basis for water quality regulation within California. The Act requires a "Report of Waste Discharge" for any discharge of waste (liquid, solid, or otherwise) to land or surface waters that may impair a beneficial use of surface or groundwater of the state. Waste discharge requirements identified in the Report are implemented by the RWQCB.

State Water Resources Control Board and Regional Water Quality Control Board

The State Water Resources Control Board (SWRCB) administers water rights, water pollution control, and water quality functions throughout the state, while the Regional Water Quality Control Boards (RWQCB) conduct planning, permitting, and enforcement activities. The project area lies within the jurisdiction of the Central Valley Regional Water Quality Control Board.

Beneficial Uses and Water Quality Objectives

The RWQCB is responsible for the protection of beneficial uses of water resources within the Central Valley Region. Beneficial uses are the desired resources, services, and qualities of the aquatic system that are supported by achieving and protecting high water quality. The RWQCB uses planning, permitting, and enforcement authorities to meet this responsibility, and has adopted the Fourth Edition of the Water Quality Control Plan (Basin Plan) for the Sacramento River and San Joaquin River Basins (RWQCB, 1998) to implement plans, policies, and provision for water quality management. The Basin Plan was prepared in compliance with the federal CWA and the State Porter-Cologne Water Quality Control Act. The Basin Plan establishes beneficial uses for major surface waters and their tributaries, water quality objectives that are intended to protect the beneficial uses of the Basin, and implementation programs to meet stated objectives and to protect the beneficial uses of water in the Basin.

Beneficial uses for groundwater in the region as designated by the RWQCB include municipal, agricultural, and industrial uses. Water quality objectives listed for groundwater include

thresholds for bacteria, organic and inorganic chemical constituents, radioactivity, taste and odor, and toxicity. Beneficial uses for surface waters of the region have been assigned MUN designations; in addition, beneficial uses have been designated for the South Fork of the American River, into which waters from the project site ultimately drain. Beneficial uses of identified waters generally apply to their tributary streams. These uses include municipal, agricultural, industrial, and recreational uses, freshwater habitat, and wildlife habitat. Water quality objectives for surface waters have been set concerning bacteria, bioaccumulation, biostimulatory substances, color, dissolved oxygen, floating material, oil and grease, radioactivity, population and community ecology, pH, salinity, sediment, settleable material, suspended material, tastes and odors, temperature, toxicity, turbidity, and ammonia. Objectives for specific chemical constituents are regulated dependent upon the beneficial use of the water body. Specific water quality objectives and standards for both surface and groundwater supplies are outlined in the Basin Plan (RWQCB, 1998).

NPDES Program

The SWRCB has issued the Caltrans Statewide NPDES Storm Water Permit (Order No. 99-06-DWQ), adopted July 15, 1999, which covers all Caltrans facilities in the State. In compliance with this permit, the Statewide Storm Water Management Plan (SWMP) was developed by Caltrans to address storm water pollution control related to highway planning, design, construction and maintenance activities throughout the State of California. The SWMP describes the minimum procedures and practices that Caltrans uses to reduce the discharge of pollutants in discharges from storm drainage systems owned or operated by Caltrans. It outlines procedures and responsibilities for protecting water quality at Caltrans facilities, including the selection and implementation of Best Management Practices (BMPs). The Proposed Project will be expected to follow the guidelines and procedures outlined in the SWMP.

Construction Activity Permitting

Caltrans must also comply with the requirements of a second NPDES permit issued by the SWRCB, “NPDES General Permit, Waste Discharge Requirements for Discharges of Storm Water Runoff Associated with Construction Activity” (Order No. 99-08-DWQ), which regulates discharges from construction sites that disturb 5 acres (2.0 hectares) or more. By law, all storm water discharges associated with construction activity where clearing, grading, and excavation results in soil disturbance of at least 5 acres (2.0 hectares) of total land area must comply with the provisions of this NPDES Permit and develop and implement an effective Storm Water Pollution Prevention Plan (SWPPP). The project applicant must submit a Notice of Intent to the RWQCB to be covered by the NPDES permit and prepare the SWPPP prior to the beginning of

construction. Implementation of the plan starts with the commencement of construction and continues through the completion of the project. Upon completion of the project, the applicant must submit a Notice of Termination to the RWQCB to indicate that construction is completed.

El Dorado County Grading Ordinance

The El Dorado County Grading Ordinance (Section 15.14 of the El Dorado County Code) requires a permit for all grading activities within the county. However, a permit is not required for, "Grading done by or under the supervision or construction control of a public agency that assumes full responsibility for the work to the extent required by law" (El Dorado County Code Section 15.14.060, Exemptions). As such, Caltrans will not be required to obtain a grading permit from the County.

5.12.4 Impacts and Mitigation Measures

Significance Criteria

A water quality impact directly or indirectly resulting from the Proposed Project would be considered significant if it would:

- Violate any water quality standards, waste discharge requirements, or otherwise substantially degrade water quality.
- Substantially alter the existing drainage pattern of the site or area, which would result in substantial erosion or siltation on- or off-site.
- Create or contribute runoff water, which would provide substantial additional sources of polluted runoff to existing or planned stormwater drainage systems.

Methodology

The surface and subsurface hydrology and drainage of the project area and its surrounding environments were reviewed to determine potential areas of impact. Pre- and post-project flows were modeled (see Drainage Section), and the data were analyzed in light of typical highway contaminant concentrations to determine the levels of impact from storm water. These levels were then compared against the standards of significance outlined below to determine significance. Mitigation measures were then developed to respond to statutory requirements and the levels of significance.

Impact/ Mitigation

Impact 5.12-1 Short-term Impacts on Water Quality from Construction

AA No action will occur as a result of the No Project/Action Alternative. ***Therefore, the No Project/Action Alternative is not expected to result in a significant impact to the environment.*** No mitigation is required.

AB, AC Construction of the Flyover or Diamond Interchange would involve soil-disturbing activities such as vegetation removal, grading, and excavation which may result in soil erosion and sediment discharge into surface waters, increased turbidity, and downstream sediment deposition. Temporary stockpiling of excavated soils would have the same effect if subject to erosion during rainfall. In addition, fuels, solvents, and other chemicals used in construction activities could be accidentally spilled, dumped, or discarded and ultimately leak into Tennessee or Slate Creeks.

As stated previously, the Proposed Project would require the preparation of a SWPPP under the Caltrans statewide NPDES permit (CAS000003, Order No. 99-06-DWQ) and general construction NPDES permit (CAS000002, Order No. 99-08-DWQ) issued by the SWRCB. These permits prohibit the discharge of waste, including soil and sediment, which causes pollution or nuisance. The RWQCB also reserves the option to specify additional requirements it may consider necessary to meet water quality standards. The conditions to protect water quality outlined in the NPDES permits, the SWPPP, and any additional RWQCB requirements would be implemented to mitigate impacts on water resources to a less-than significant level.

Construction activities will comply with all requirements and guidelines associated with the aforementioned NPDES permits. A SWPPP will be created by the contractor and implemented under the Caltrans Construction SWMP to outline BMP's that minimize impacts to water quality. A Notice of Intent (NOI) for the SWPPP will be formulated and enacted prior to construction activities. The SWPPP will also be kept on site for the duration of all construction and maintained in accordance with the applicable NPDES permits.

BMP's that may be identified in the SWPPP include, but are not limited to, the following:

- Existing vegetation will be retained where possible. To the extent feasible, grading activities will be limited to the immediate area required for construction.
- Temporary erosion control measures (such as silt fences, staked straw bales, and temporary revegetation) will be employed for disturbed areas and stockpiled soil.
- No disturbed surfaces will be left without erosion control measures in place during the winter and spring months. Construction activities will be limited to the non-rainy season (May-October).
- Sediment will be retained onsite by a system of sediment basins, swales, or other appropriate measures.
- A spill prevention and countermeasure plan will be developed which will identify proper storage, collection, and disposal measures for potential pollutants (such as fuel storage tanks) used onsite, as well as the proper procedures for cleaning up and reporting of any spills.
- Potentially hazardous materials will be stored away from drainages, and containment berms will be constructed to prevent spilled materials from reaching water bodies.
- Vehicles and equipment used during construction will be provided proper and timely maintenance to reduce potential for mechanical breakdowns leading to a spill of materials into water bodies. Maintenance and fueling will be conducted in an area that meets the criteria set forth in the spill prevention plan.
- Disturbed areas will be revegetated after completion of construction activities.

Therefore, the Flyover Interchange Design Alternative and the Diamond Interchange Design Alternative are not expected to result in a significant impact to the environment.

Mitigation 5.12-1 Short-term Impacts on Water Quality from Construction

None Reqiured.

Impact 5.12-2 Impacts from Erosion Related to Stream or River Alteration

AA No action will occur as a result of the No Project/Action Alternative. ***Therefore, the No Project/Action Alternative is not expected to result in a significant impact to the environment.*** No mitigation is required.

AB,AC Construction of the Flyover Interchange or the Diamond Interchange will not result in significant alterations to any jurisdictional waterbody or channel. A 75 square foot (7.0 square meter) portion of one of the ephemeral drainages will be impacted by fill to allow for the transportation crossing. Section 404 permit will be obtained from the Army Corp of Engineers to allow for the fill and construction of the linear transportation crossing over the ephemeral drainage. Section 401 certificate will be obtained from the RWQCB and will outline site-specific BMP's for discharges during construction and operation. Under Section 1601of the California Fish and Game Code, an agency proposing to substantially divert the natural flow of a stream, substantially alter its bed or bank, or use any material from the streambed, must first enter into a "Streambed Alteration Agreement" with CDFG. The Proposed Project would require a Streambed Alteration Agreement. Other onsite drainages will be temporarily altered during construction, but later restored. No significant change to erosion or siltation on- or off-site as a result of streambed alterations is expected. ***Therefore, the Flyover Interchange Design Alternative and the Diamond Interchange Design Alternative are not expected to result in a significant impact to the environment.***

Mitigation 5.12-2 Impacts from Erosion Related to Stream or River Alteration

None Required.

Impact 5.12-3 Impacts to Groundwater Quality

AA No action will occur as a result of the No Project/Action Alternative. ***Therefore, the No Project/Action Alternative is not expected to result in a significant impact to the environment.*** No mitigation is required.

AB,AC The Proposed Project is not expected to change the quality of groundwater by interceptions of groundwater flow through cuts to the native topography. The Proposed Project will not utilize groundwater during operations. ***Therefore, the***

Flyover Interchange Design Alternative and the Diamond Interchange Design Alternative are not expected to result in a significant impact to the environment.

Mitigation 5.12-3 Impacts to Groundwater Quality

None Required.

Impact 5.12-4 Cumulative Impacts To Water Quality

AA No action will occur as a result of the No Project/Action Alternative. ***Therefore, the No Project/Action Alternative is not expected to result in a significant impact to the environment.*** No mitigation is required.

AB,AC As outlined in the drainage section, project construction would result in increased impervious surfaces from the construction of on-ramps and off-ramps. This increase in impervious surface area would result in less infiltration of rainfall into the ground within the project area, causing total runoff volumes to increase. This increase in highway runoff has the potential to degrade water quality over time, particularly during "first flush" storm events. As stated earlier, the proposed interchange falls under the Caltrans statewide NPDES permit (CAS000003, Order No. 99-06-DWQ) issued by the RWQCB. The SWMP prepared pursuant to this permit outlines methodologies for selection and implementation of BMPs to mitigate adverse impacts to water quality, and the NPDES permit requires the implementation of appropriate BMPs. These BMPs are expected to mitigate any impacts to water quality.

Appropriate BMPs will be selected and implemented using the SWMP guidance in an effort to reduce impacts to water quality to the maximum extent possible. These BMP's fall into several categories: Category IA (Maintenance BMPs), Category IB (Design Pollution Prevention BMPs), and Category III (Treatment BMPs) (Caltrans, 2001a). These BMPs will be adopted under the appropriate Caltrans programs. ***Therefore, the Flyover Interchange Design Alternative and the Diamond Interchange Design Alternative are not expected to result in a significant impact to the environment.***

Mitigation 5.12-4 Cumulative Impacts on Water Quality

None Required.

5.13 Drainage

5.13.1 Introduction

The Drainage Section of the EIR analyzes the potential short-term, long-term, and cumulative impacts resulting from the construction and operation of the Project and alternatives. The drainage discussion will analyze the drainage conditions in the proposed Shingle Springs Interchange region.

5.13.2 Environmental Setting

Climate

THE WINTERS ARE COOL AND MOIST WITH HOT DRY SUMMERS. THE PEAK RAINFALL PERIOD IS BETWEEN JANUARY AND MARCH WHEN THE JET STREAM TENDS TO DIP SOUTH OF SAN FRANCISCO BAY AND THE STORM TRACK TAKES A SOUTHWESTERLY ROUTE FROM THE PACIFIC THROUGH THE BAY AREA AND INTO THE SACRAMENTO-SAN JOAQUIN DELTA. RAINFALL INCREASES RAPIDLY WITH ELEVATION AS THE CLOUDS PILE UP AGAINST THE SIERRA NEVADA MOUNTAINS. WITHIN TWENTY (20) MILES (32.2 KM) ONE CAN EXPERIENCE FIFTEEN (15) INCHES TO FORTY (40) INCHES (0.38 M TO 1.0 M) OF RAIN PER YEAR. THIS RAINFALL PATTERN IS PREDICTABLE WITH STORM DURATIONS OF 12- 24 HOURS. WITHIN THESE TOTAL STORM DURATIONS, THERE CAN BE PERIODS OF MORE INTENSE SHORT DURATION RAINFALL, PARTICULARLY AS THE MAIN COLD FRONT APPROACHES. SUMMER PRECIPITATION IS RARE, USUALLY CAUSED BY MONSOONAL MOISTURE FROM EITHER THE GULF OF MEXICO OR GULF OF CALIFORNIA. WHILE THESE SUMMER MONSOONS MAY BRING THUNDERSTORMS TO THE HIGHER ELEVATIONS ALONG THE CREST OF THE SIERRAS, THE LOWER ELEVATIONS MAY RECEIVE NOTHING MORE THAN A SPRINKLING.

PRECIPITATION IN THE SLATE CREEK WATERSHED OF WESTERN EL DORADO COUNTY AVERAGES BETWEEN THIRTY (30) INCHES AND THIRTY-SIX (36) INCHES (0.8 M AND 0.9 M) ANNUALLY (NOAA, 1973). THE NEAREST WEATHER STATION IS IN PLACERVILLE LOCATED SEVEN (7) MILES (11.3 KM) EAST OF THE PROJECT SITE. RAINFALL DATA FROM PLACERVILLE WAS NOT USED BECAUSE THE ANNUAL AVERAGE IS BETWEEN THIRTY-SEVEN (37) AND THIRTY-EIGHT (38) INCHES (0.9 M - 0.96 M), WHILE THE AVERAGE FOR THE ENTIRE SLATE CREEK WATERSHED IS APPROXIMATELY THIRTY-FIVE (35) INCHES (0.88 M). THEREFORE, THE NOAA ISOPLUVIALS, LINES OF

EQUIVALENT ANNUAL PRECIPITATION, WERE USED TO INTERPOLATE THE ANNUAL PRECIPITATION, WHICH IS ESTIMATED TO BE THIRTY-FOUR (34) INCHES (0.86 M) ACCOUNTING FOR ELEVATION AND HISTORIC RAINFALL ISOPLUVIALS.

Watershed Setting

THE PROPOSED PROJECT IS LOCATED WITHIN THE SLATE CREEK WATERSHED, WHICH IS APPROXIMATELY 5,365 ACRES (2,171 HA) IN SIZE (**FIGURE 5.13-1)**. IT IS IDENTIFIED AS A PERENNIAL STREAM ON THE USGS SHINGLE SPRINGS QUADRANGLE. THE CREEK BEGINS IN SECTION 26 OF TOWNSHIP 10 NORTH,

SEE FIGURE 5.13-1

RANGE 10 EAST ON THE SHINGLE SPRINGS QUADRANGLE AND FLOWS WEST THEN NORTH UNDER STATE HIGHWAY 50, ONE-QUARTER (¼) MILE EAST OF THE PROJECT SITE. THE STREAM PASSES THROUGH THE GRASSY RUN RESIDENTIAL COMMUNITY BEFORE MERGING WITH DRY CREEK APPROXIMATELY FIVE (5) MILES (8.0 KM) FROM ITS HEADWATERS. LAND USE WITHIN THE SLATE CREEK WATERSHED IS PRIMARILY RURAL RESIDENTIAL WITH LOTS VARYING IN SIZE BUT USUALLY COMPRISING FIVE (5) ACRES (2 HA) OR MORE.

A SMALL PORTION OF THE PROJECT SITE DRAINS TO TENNESSEE CREEK, APPROXIMATELY ONE (1) MILE (1.6 KM) TO THE WEST. TENNESSEE CREEK, IS AN INTERMITTENT STREAM AS IDENTIFIED ON THE USGS SHINGLE SPRINGS 7.5 MINUTE QUADRANGLE. THIS CREEK BEGINS IN SECTION 32 OF TOWNSHIP 10 NORTH, RANGE 10 EAST ON THE SHINGLE SPRINGS QUADRANGLE. A TRIBUTARY OF DRY CREEK, IT HAS THE SAME LAND USE CHARACTERISTICS AS THE SLATE CREEK WATERSHED.

EXISTING DRAINAGE, CULVERTS, AND BRIDGES

Sub-Basin D1:

Sub-basin D1 is 36.05 acres (14.5 ha) in size **(Figure 5.13-2)**, originating on the north side of Highway 50 at the foot of a cut bank. Water is dissipated by an accumulation of woody debris, detritus, grasses, poison oak, and live oak where sheet flow exits via an asphalt-paved drainage way. Highway runoff joins overland flow from surrounding terrain at the base of the fill slope, which comprises the west-bound emergency turnout of Highway 50. The combined runoff flows in an easterly direction for approximately 1,500 feet (457 m), toward Culvert 1 **(Figure 5.13-1)**, where it is augmented by discharge from an open concrete drain. The cumulative runoff from sub-basin D1 flows to Culvert 1, a 36 inch (0.9 m) diameter corrugated metal culvert. The channel at the culvert inlet is protected from excessive erosion by a concrete apron extending approximately four (4) feet upstream. Based on visual inspection, the maximum headwater depth for Culvert 1 is approximately three (3) meters. **Figure 5.13-2** shows existing drainage patterns within Sub-basin D1.

Sub-Basin D2:

Sub-basin D2 comprises 9.23 acres (3.7 ha) on the north side of Highway 50. Sub-basin D2 runoff consists of overland flow from rural residential property and the southeast corner of the Rancheria. Surface runoff from the section of Highway 50 between Culverts 1 and 2 flows into Sub-basin D2 through an open concrete drain. Sub-basin D2 drains to Culvert 2

(Figure 5.13-1), a twenty-four (24) inch (0.6 m) diameter corrugated metal pipe. Based on visual inspection, the maximum headwater depth for Culvert 2 is approximately two (2) meters. **Figure 5.13-2** shows existing drainage patterns within Sub-basin D2.

See Figure 5.13-2

Sub-Basin D3:

Sub-basin D3 is 32.23 acres (13.04 ha) in size, located south of the project area, originating at the crest of the Highway 50 cut **(Figure 5.13-2)**. Surface runoff flows approximately twelve hundred (1,200) feet (365.7 m) in an easterly direction, and drains off the highway via a paved curb and gutter. The flow path is, however, blocked by debris, resulting in the diversion of runoff into an open field and creation of an eroded gully on private property adjacent to the highway ROW. Highway runoff combines with overland flow, and discharge from Culverts 1 and 2, at the foot of the east-bound Highway 50 fill slope. Sub-basin D3 has no culvert outlet. The combined runoff from Sub-basins D1 - D3 is tributary to Slate Creek approximately 0.25 mile (0.4 km) east of the project site, and three hundred (300) feet (91.4 m) upstream from the Highway 50 Slate Creek culvert. **Figure 5.13-3** shows existing drainage patterns within Sub-basin D3.

Sub-Basin SC1:

Sub-basin SC1 encompasses the watershed area, excluding sub-basins D1 - D3, tributary to the Highway 50 Slate Creek Culvert. Sub-basin SC1 drains an area of approximately 4,735 acres (1,916 ha). The Highway 50 Slate Creek culvert **(Figure 5.13-1)** is approximately fifteen (15) feet (4.6 m) in diameter, three hundred (300) feet (91 m) in length, and follows the historic channel alignment. Field observations indicate the possible presence of a natural spring in the channel, upstream of the culvert. The culvert outfall has a well-established pool and riparian habitat.

Sub-Basin D4:

Sub-basin D4 **(Figure 5.13-2)** is 52.32 acres (2,117 ha) in extent, draining the southwest portion of the project site, and approximately two hundred (200) feet (60.9 m) of east-bound Highway 50. Roadway runoff is directed via curb and gutter to a paved open drain that flows in a westerly direction, and discharges to a grassy swale at the base of the east-bound Highway 50 fill slope. The swale also collects runoff from the remainder of the sub-basin, and conveys it to Culvert 3 **(Figure 5.13-1)**, a thirty-six (36) inch (0.9 m) diameter corrugated metal pipe. Based on visual inspection, the maximum headwater depth for Culvert 3 is approximately three (3) meters. Sub-basin D4 is tributary to Tennessee Creek. **Figure 5.13-4** shows existing drainage patterns within Sub-basin D4.

Sub-Basin SC2:

Sub-basin SC2 **(Figure 5.13-2)** is comprised of 552.17 acres, representing the incremental drainage area between the Highway 50 Slate Creek culvert, and the confluence of Slate

See Figure 5.13-3

See Figure 5.13-4

CREEK WITH DRY CREEK. A ONE HUNDRED FORTY-TWO (142) ACRE (57.5 HA) PORTION OF SUB-BASIN SC2, HEREINAFTER REFERRED TO AS SUB-BASIN SC2', IS TRIBUTARY TO SLATE CREEK AT THE RESERVATION ROAD BRIDGE CROSSING.

THE RESERVATION ROAD BRIDGE HAS A SPAN OF APPROXIMATELY THIRTY-FIVE (35) FEET (10.6 M), WITH ITS LOW CHORD APPROXIMATELY EIGHT (8) FEET (2.4 M) ABOVE THE FLOW LINE OF SLATE CREEK. VISUAL INSPECTION OF THE OVER BANK AREA INDICATED HIGH WATER MARKS AT APPROXIMATELY 8 FOOT (2.4 M) DEPTH.

Methodology

Watershed Delineation

The majority of the Proposed Project site, approximately ninety-five percent (95%), is within the Slate Creek watershed. The portion of the Project within the Tennessee Creek watershed has previously been analyzed by Caltrans in conjunction with studies of Highway 50 widening. Since design alternatives for the Proposed Project would have minimal impact on discharge to Tennessee Creek, the present study focuses on the Slate Creek watershed.

The boundaries of the Slate Creek watershed, delineated on the USGS 7.5 minute Shingle Springs Quadrangle, are shown in **Figure 5.13-1**. The highest point in the watershed is at the Logtown historic town site, at elevation 2,012 feet (613 m); the lowest point is at the confluence of Slate Creek with Dry Creek, at elevation 1,160 feet (354 m).

THE SLATE CREEK WATERSHED WAS DIVIDED INTO FIVE SUB-BASINS, DESIGNATED SUB-BASINS D1, D2, D3, SC1, AND SC2, REPRESENTING AREAS TRIBUTARY TO KEY POINTS FOR WHICH STREAM FLOWS WERE EVALUATED. A SINGLE SUB-BASIN, SUB-BASIN D4, TRIBUTARY TO TENNESSEE CREEK, WAS IDENTIFIED. SITE INSPECTION WAS USED TO VERIFY EFFECTS OF INFRASTRUCTURE SUCH AS ROADS, CULVERTS, AND OTHER DRAINAGE STRUCTURES, ON THE PLACEMENT OF SUB BASIN BOUNDARY LINES. WATERSHED BOUNDARIES ARE SHOWN ON **FIGURE 5.13-1**. THE SUB-BASINS THAT RESULTED ARE DESCRIBED IN THE FOLLOWING PARAGRAPHS. **TABLE 5.13-1** SUMMARIZES THE SUB-BASIN DESCRIPTIONS.

Soils

SOILS ARE ONE OF THE PRIMARY INFLUENCES ON SURFACE RUNOFF RATES. INFILTRATION RATES OF SOILS VARY WIDELY AND ARE AFFECTED BY SUBSURFACE PERMEABILITY AS WELL AS BY SURFACE INTAKE RATES. THE UNITED STATES DEPARTMENT OF AGRICULTURE, NATURAL RESOURCES CONSERVATION SERVICE, HAS CLASSIFIED SOILS INTO FOUR (4) HYDROLOGIC SOIL GROUPS, BASED ON THE MINIMUM INFILTRATION RATES OF THE SOILS. HYDROLOGIC SOIL GROUPS ARE RANKED A TO D. SOILS IN GROUP A HAVE THE HIGHEST

Table 5.13-1 Summary Description Of Drainage Sub-Basins

Sub-Basin	Area (Acres)	Descriptions
D1	36.06	AREA TRIBUTARY TO CULVERT 1; LOCATED NORTH OF HWY 50, ADJACENT TO HWY; TRIBUTARY TO SLATE CREEK UPSTREAM OF HWY 50
D2	9.23	AREA TRIBUTARY TO CULVERT 2; LOCATED NORTH OF HWY 50, ADJACENT TO HWY; TRIBUTARY TO SLATE CREEK UPSTREAM OF HWY 50
D3	32.23	Located south of Hwy 50, adjacent to hwy; receives outflow from sub-basins D1 & D2; discharges directly into Slate Creek
D4	52.32	Area tributary to Culvert 3; located south of Hwy 50, adjacent to hwy; discharges into Tennessee Creek
SC1	4,375	Area (excluding D1-D3) tributary to Hwy 50 Slate Creek culvert; LOCATED SOUTH OF HWY 50
SC2	552.17	Incremental area tributary to Slate Creek downstream of the Hwy 50 culvert; primarily located north of Hwy 50; SC2 includes most of the Rancheria & the Grassy Run residential community
SC2'	142	Portion of sub-basin SC2; tributary to Slate Creek above Reservation Road

SOURCE: GENE E. THORNE & ASSOCIATES, INC., 2001

rates of infiltration and water transmission, while those in group D have low infiltration rates and high runoff potential.

Surface runoff is also influenced by the extent and type of soil cover, or disturbances to the soil profile. Within the project area, cover conditions vary, and include the following: impervious surfaces, bedrock, graveled drives, dirt roads and drives, paved roads and drives, residences and surrounding outbuildings and yards, managed grazing, and undisturbed natural conditions.

As indicated in the El Dorado Soil Survey, the Proposed Project is underlain by soils having two basic hydrologic characteristics. Diamond Springs sandy loam, Dfd, is shown within a portion of the project. In reality, however, this area consists of exposed bedrock. For purposes of runoff analyses, this is treated as impermeable surface area. Soils of the

approximately 5.6 acre (2.3 ha) project site, as well as those adjacent to Highway 50, are classified in hydrologic soil group D. Soils within the rest of the Slate Creek watershed were also determined to be in hydrologic soil group D.

The Soil Conservation Service has developed a relationship between soil type and runoff potential, expressed as a runoff curve number (CN). The major factors that determine CN are the hydrologic soil group, cover type, treatment, hydrologic condition, and antecedent runoff condition. Curve numbers representing average antecedent moisture conditions for pre-development conditions within the sub-basins identified in this study (**Table 5.13-2**).

Table 5.13-2 Curve Number Representing Average Antecedent Moisture Condition For Pre-Development Conditions Within Sub-Basins

Sub-Basin	Curve Number
D1	82
D2	86
D3	85
D4	82
SC1	80
SC2	80

Source: Gene E. Thorne & Associates, Inc., 2001

Post-Development Conditions

Any disturbance of soil profile or changes in soil cover will change the runoff characteristics of a watershed. The interchange project will alter approximately 5.6 acres (2.3 ha) within the project site, and a portion of the ROW for the proposed west-bound on-ramp. Future modifications are located in sub-basin D1 only. Infiltration rates in approximately four 4 acres (1.6 ha) within sub-basin D1 would be affected by the project. These changes involve 2.27 acres (0.9 ha) of new roadway and 1.75 acres (0.7 ha) of disturbed surface area adjacent to the interchange and access road.

Implementation of the Proposed Project would raise the runoff curve number of sub-basin D1 from eighty-two (82) to eighty-five (85), due to creation of additional impervious area within the sub-basin. Runoff curve numbers in all other sub-basins are unchanged for post-development conditions. The post-development condition is the same for either of the interchange design alternatives.

Runoff Computations

Rational Method

Peak runoff expected to occur over sub-basins D1 through D4 was computed by means of the Rational Method. The equation is: Q = C I A, where Q is the rate of surface discharge, in cubic feet per second (cfs).

The runoff coefficient "C" is a dimensionless factor representing the percent of water expected to run off the ground surface during the storm. The coefficient "C" is determined through consideration of topographic relief in the sub-basin, soil infiltration capacity, vegetal cover, and availability of surface storage. Runoff coefficients applicable for the ten (10) year storm were determined from Figure 819.2A and Table 819.2B of the Highway Design Manual and adjusted by a frequency factor of 1.25 for computing one hundred (100) year storm runoff.

The value of "I" represents rainfall intensity, in inches per hour, for rainfall duration equal to the time of concentration computed for the sub-basin under analysis. Values of "I" are obtained from rainfall intensity-duration-frequency tables included in the El Dorado County Drainage Manual. For this project an average annual precipitation of thirty-four (34) inches (0.86 m) was obtained. Design discharge, as computed by the Rational Method has the same probability of occurrence (design frequency) as the frequency of the rainfall used.

In order to select the appropriate rainfall intensity for use in the Rational Method equation, it is necessary to know the time of concentration for the sub-basin in question. Time of concentration is defined as the time it takes for water falling on the most hydraulically distant point in the sub-basin to reach the outlet. Times of concentration may be computed using empirical formulas based on flow lengths, and watershed slopes, or may be estimated from field observations. For sub-basins D1 through D4, times of concentration were estimated from field conditions, taking into account surface roughness, debris accumulation, presence of detention structures, and estimated travel distance and route. These values, shown in **Table 5.13-3**, are comparable to those used in the Drainage Report for the Shingle Springs Rancheria Casino EA (Gene E. Thorne & Associates, Inc., 2001).

Determination of sub-basin areas was described in a preceding section.
The Rational Method was used to compute peak discharge for each sub-basin, under both pre and post development conditions. The Proposed Project would change the runoff characteristics of only sub-basin D1. The effects of the project cause the CN in sub-basin D1

to increase to eighty-five (85). The results of the peak discharge computation are summarized in **Table 5.13-3**.

Hydrograph Method (HEC-1)

Use of the Rational Method for peak flow computation is limited to watershed areas less than three hundred twenty (320) acres (129 ha). However, as part of this study, it was desired to compute runoff at key points with drainage areas in excess of three hundred twenty (320) acres (129 ha). These key points are located on Slate Creek where flow from two or more drainage sub basins is combined. A hydrograph method of estimating design discharge is used for determining the combined rate of runoff from two or more drainage areas that peak at different times. Section 819.6 of the Highway Design Manual cites the US Army Corps of Engineers HEC-1 Flood Hydrograph Package as a commonly used method for hydrograph simulation.

Table 5.13-3 Summary Of Peak Runoff Computations For Sub-Basins D1 Through D4

Pre-Development Peak Runoff									
				10-Year Storm			100-Year Storm		
Drainage Shed	Area (Acres)	Curve Number (CN)	Time Of Concentration (Min.)	Runoff Coeff. (C)	Rainfall Intensity ('I'; In/hr)	Peak Runoff Q=CIA (Cfs)	Runoff Coeff. (C)	Rainfall Intensity ('I'; In/hr)	Peak Runoff Q=CIA (Cfs)
D1	36.05	82	30	0.58	1.22	**25.5**	0.72	1.73	**44.90**
D2	9.23	86	15	0.60	1.7	**9.41**	0.75	2.42	**16.75**
D3	32.23	85	30	0.60	1.22	**23.59**	0.75	1.73	**41.82**
D4	52.32	82	30	0.58	1.22	**37.02**	0.72	1.73	**65.17**
Post-Development Peak Runoff									
				10-Year Storm			100-Year Storm		
Drainage Shed	Area (Acres)	Curve Number (CN)	Time Of Concentration (Min.)	Runoff Coeff. (C)	Rainfall Intensity ('I'; in/hr)	Peak Runoff Q=CIA (cfs)	Runoff Coeff. (C)	Rainfall Intensity ('I'; in/hr)	Peak Runoff Q=CIA (cfs)
D1	36.05	85	30	0.62	1.22	**27.27**	0.78	1.73	**48.65**
D2	9.23	86	15	0.60	1.7	**9.41**	0.75	2.42	**16.75**
D3	32.23	85	30	0.60	1.22	**23.59**	0.75	1.73	**41.82**
D4	52.32	82	30	0.58	1.22	**37.02**	0.72	1.73	**65.17**

SOURCE: GENE E. THORNE & ASSOCIATES, INC., 2001

A HEC-1 flow network was developed in order to compute flows in Slate Creek at the Reservation Road Bridge, and at the confluence of Slate Creek with Dry Creek. For the HEC-1 analyses, Sub basins D1 through D3 were treated as a single shed area, while the portion of Sub basin SC2 that contributes to flow in Slate Creek at the bridge location was treated as a separate sub basin, referred to as Sub-basinSC2'. Sub-basin D4 is not tributary to Slate Creek at the key points identified for analysis. Therefore, Sub-basin Dr is not included in the HEC-1 computations.

Input data requirements for HEC-1 are similar to those for the peak discharge method. However, the HEC-1 model simulates surface runoff response over a period of time, rather than as a single value. Precipitation data represents a storm of given duration, with temporal distribution characteristic of storms affecting the watershed location. For the present analyses, a twenty-four (24) hour, SCS Type 1 storm was simulated. Computations are based on the SCS curve number loss rate and use of an SCS dimensionless unit graph. Sub-basin lag times were taken to be equivalent to 0.6Tc, with time of concentration, Tc, estimated using the equation: $Tc = (11.9L^3/H)^{0.385}$, where L is length of watercourse, in miles, and H is elevation difference within the watershed, in feet. HEC-1 input parameters are summarized in **Table 5.13-4** below.

Table 5.13.4 HEC-1 Input Parameters

Sun-Basin	Area (sq. mi.)	Pre-Development CN	Post-Development CN	LAG (hrs.)
D1 thru D3	0.12	83.7	85.1	0.30
SC1	7.40	80	80	1.1
SC2	0.64	80	80	0.60
SC2'	0.22	80	80	0.50

Source: Gene E. Thorne & Associates, Inc., 2001

Results of the HEC-1 hydrograph analyses are shown in **Table 5.13-5**.

Table 5.13-5 Peak Runoff Hydrograph Computations Using HEC-1

Location	10-YEAR STORM		100-YEAR STORM	
	Pre-Development (cfs)	Post-Development (cfs)	Pre-Development (cfs)	Post-Development (cfs)
Slate Creek at Hwy 50	2541	2542	4392	4392
Slate Creek at Reservation Road Crossing	2593	2594	4483	4484
Slate Creek at confluence with Dry Creek	2752	2752	4765	7466

Source: Gene E. Thorne & Associates, Inc., 2001

TABLE 5.13-6 SUMMARIZES THE RESULTS OF THE TR-55 HYDROGRAPH COMPUTATIONS. IT SHOULD BE NOTED THAT PEAK FLOWS COMPUTED IN THE TR-55 ANALYSES ARE COMPARABLE TO THE HEC-1 RESULTS, AND SHOW NO IMPACT ON FLOWS IN SLATE CREEK RESULTING FROM PROJECT DEVELOPMENT.

Table 5.13-6 TR-55 Runoff Summary

Pre-Development Runoff at Key Points in Slate Creek Watershed								
					10 Year Storm		100 Year Storm	
Location	Tributary Sub-basin(s)	Area (mi^2)	Composite CN	SCS Storm Type	24 hr. Precip. (in.)	Computed Runoff (cfs)	24 hr. Precip. (in.)	Computed Runoff (cfs)
Hwy 50 Culvert	SC1+D1-DE	7.52	80	I	4.51	2,659	6.39	4,520
Reservation Rd. Bridge	SC1=D1-D3+SC2'	7.74	80	I	4.51	2,737	6.39	4,652
Dry Creek Confluence	SC1+D1-D3+SC2	8.16	80	I	4.51	2,885	6.39	4,904

Table 5.13-6 (Cont.) Tr-55 Runoff Summary

Post Development Runoff at Key Points in Slate Creek Watershed								
					10 Year Storm		100 Year Storm	
Location	Tributary Sub-basin(s)	Area (mi^2)	Composite CN	SCS Storm Type	24 hr. Precip. (in.)	Computed Runoff (cfs)	24 hr. Precip. (in.)	Computed Runoff (cfs)
Hwy 50 Culvert	SC1+D1-D3	7.52	80	I	4.51	2,659	6.39	4,520
Reservation Rd. Bridge	SC1+D1-D3+SC2'	7.74	80	I	4.51	2,885	6.39	4,652
Dry Creek Confluence	SC1+D1-D3+SC2	8.16	80	I	4.51	2,885	6.39	4,904

Source: Gene E. Thorne & Associates, Inc., 2001

Predicted Discharge

IN ORDER TO ESTIMATE PROJECT IMPACTS, IT IS NECESSARY TO CALCULATE THE PREDICTED SURFACE DISCHARGE OVER THE PROJECT AREA SUB-BASINS. THIS WAS DONE BY COMPARING THE PRE AND POST PROJECT RESULTS FOR DRAINAGES 1-4. THE RATIONAL METHOD WAS USED ON AREAS SC1 AND SC2 AND EACH SEGMENT OF BOTH DESIGN ALTERNATIVES. SINCE NO CONSTRUCTION WILL OCCUR IN DRAINAGES SC1 AND SC2, NO CHANGES TO DISCHARGE WILL OCCUR. THE SAME CRITERIA AND ASSUMPTIONS ARE MADE FOR THE ANALYSIS OF POST-PROJECT DISCHARGE:

- RUN OFF INCREASES WITH STORM INTENSITY;
- TIME OF CONCENTRATION IS NOT ALTERED BY THE PROJECT;
- FIELD OBSERVATIONS AND MEASUREMENTS ARE COMPARABLE TO THE DESIGN PARAMETERS OF CULVERTS.

THE ONLY CRITERION THAT HAS CHANGED IS THE WEIGHTED RUNOFF COEFFICIENT. THIS NUMBER HAS BEEN READAPTED FOR EACH SEPARATE SUB-BASIN THAT WILL HAVE IMPERMEABLE SURFACE AREA ADDED, OR AN ALTERED HYDRAULIC GRADIENT. SEPARATE SETS OF NUMBERS ARE AVAILABLE FOR BOTH INTERCHANGE DESIGNS CONSIDERED.

The hydraulic gradients and drainage patterns are best maintained in the Flyover design option. Only surface discharge from the east-bound off-ramp will be redirected to Tennessee Creek. The estimated volume is 0.34 cfs. The Diamond Interchange design directs more flow from the Slate Creek sub-basins to the Tennessee Creek. The redirected water volume

from the Diamond Interchange design is 0.52 cfs. The locations of the hydraulic gradient breaks are found in **Figure 5.13-5** and **Figure 5.13-6** and **Tables 5.13-7 and 5.13-8**.

See Figure 5.13-5

See Figure 5.13-6

Table 5.13-8 shows the predicted discharge from each segment of each alternative and the predicted design discharge for each storm return period. **Table 5.13-8** shows the predicted contribution to each sub-basin for both alternatives. Both tables show discharge is comparable for each alternative.

THE ADDITIONAL LANE (**FIGURE 5.13-7**) HAS BEEN DISCOUNTED BECAUSE DISCHARGES FROM THIS ARE NOT EXPECTED TO CHANGE SINCE THE SURFACE HAS NEAR TOTAL RUNOFF (~0.97) UNDER CURRENT CONDITIONS. SURFACE DISCHARGE FROM THE ADDITION OF THIS LANE WILL BE TRANSPORTED THROUGH THE EXISTING CENTERLINE DRAINAGE DITCH. CALTRANS, IN PLANNING FOR FUTURE EXPANSION OF HIGHWAY 50 FROM A FOUR (4) LANE TO A SIX (6) LANE, HAS CONSIDERED THE ADDITIONAL SURFACE RUNOFF TO BE A LESS THAN
SIGNIFICANT IMPACT (RHOADS, PERS. COMM.). NO WATER WILL BE REDIRECTED TO A NEIGHBORING WATERSHED.

Table 5.13-7 Predicted Surface Discharge (cfs) Of Roadway Segments For The Flyover Design And Diamond Design Interchange Alternatives

	1 HR STORM RETURN INTERVAL				
INTERCHANGE SEGMENT	**2.33YR**	**10 YR**	**25 YR**	**50 YR**	**100 YR**
FLYOVER DESIGN					
EASTBOUND OFF-RAMP	0.69	1.09	1.20	1.32	1.45
EASTBOUND ON-RAMP	0.53	0.78	0.92	1.02	1.11
WEST BOUND OFF-RAMP	0.46	0.67	0.80	0.89	0.97
WESTBOUND ON RAMP	0.41	0.61	0.72	0.80	0.87
ARTESIA	0.10	0.15	0.17	0.19	0.21
ACCESS ROAD	0.59	0.87	1.03	1.14	1.25
AUXILIARY LANE	0.80	1.17	1.39	1.54	1.68
DESIGN TOTAL DISCHARGE (CFS)	**3.57**	**5.25**	**6.06**	**6.89**	**7.53**
DIAMOND DESIGN					
EASTBOUND OFF-RAMP	0.32	0.47	0.56	0.62	0.67
EASTBOUND ON-RAMP	0.38	0.56	0.67	0.74	0.81
WEST BOUND OFF-RAMP	0.40	0.58	0.69	0.76	0.83
WESTBOUND ON RAMP	0.28	0.42	0.50	0.55	0.60
ARTESIA	0.10	0.15	0.17	0.19	0.21
ACCESS ROAD	1.05	1.55	1.83	2.03	2.28
AUXILIARY LANE	0.80	1.17	1.39	1.54	1.68
DESIGN TOTAL DISCHARGE (CFS)	**3.33**	**4.89**	**5.81**	**6.42**	**7.02**

Source: AES, 2001; Mark Thomas & Co., Inc., 2001; El Dorado County, 1995

NOT ALL DISCHARGE FROM THE PROPOSED PROJECT HAS BEEN CONSIDERED ADDITIONAL DISCHARGE. DISCHARGE FROM ALTERED HYDRAULIC GRADIENTS HAS BEEN CONSIDERED AS REDISTRIBUTED DISCHARGES

See Figure 5.13-7

FROM EXISTING SUB-BASINS. **TABLE 5.13-8** IDENTIFIES THE POST-PROJECT DISCHARGE AND RECEIVING DRAINAGE OF EACH DESIGN ALTERNATIVE. THIS WOULD STILL ALTER THE SURFACE DRAINAGE BUT WOULD NOT BE CONSIDERED ADDITIONAL DISCHARGE. BECAUSE MUCH OF THE PROPOSED PROJECT WILL BE CONSTRUCTED ON ALREADY IMPERVIOUS SURFACES, DISCHARGE FROM THESE AREAS IS NOT CONSIDERED ADDITIONAL. THE ONLY DISCHARGE TO ACTUALLY BE CONSIDERED AS ADDITIONAL IS FROM THE ACCESS ROAD LEADING THROUGH THE 5.6-ACRE PARCEL.

TABLE 5.13-8 Predicted Discharge (Cfs) Into Sub-Basins By Interchange Design Alternatives

Alternative	Interchange Discharge to Sub-basin				
Flyover Design	**Drainage 1**	**Drainage 2**	**Drainage 3**	**Drainage 4**	**Return Period Total**
2.33 year	1.91	0.12	0.53	1.01	3.57
10 year	2.81	0.18	0.77	1.49	5.25
25 year	3.33	0.22	0.92	1.59	6.06
50 year	3.69	0.24	1.01	1.95	6.89
100 year	4.03	0.26	1.11	2.13	7.53
Diamond Design					
2.33 YEAR	1.20	0.21	0.74	1.19	3.34
10 year	1.76	0.31	1.08	1.74	4.89
25 year	2.09	0.37	1.28	2.07	5.81
50 YEAR	2.30	0.41	1.42	2.28	6.41
100 year	2.52	0.45	1.55	2.50	7.02

Source: AES, 2001; Mark Thomas & Co., Inc., 2001; El Dorado County, 1995

5.13.3 Impacts And Mitigation Measures

Significance Criteria

DRAINAGE IMPACTS FOR THIS PROJECT WILL BE CONSIDERED SIGNIFICANT IF THE ADDITIONAL FLOWS FOR PREDETERMINED STORM EVENTS EXCEED THE DESIGN CAPACITIES OF EXISTING STRUCTURES (FOUR CULVERTS AND ONE BRIDGE DOWNSTREAM OF THE PROPOSED PROJECT) OR CAUSE SURFACE EROSION ABOVE BACKGROUND LEVELS DEFINED BY THE NRCS UNIVERSAL SOIL LOSS EQUATIONS. FOR STREAM CULVERTS THIS WOULD MEAN THE EXCEEDANCE OF THE ALLOWABLE HEADWATER AND/OR CAUSING EXCESSIVE EROSION OF THE CULVERT EMBANKMENTS. AS IT APPLIES TO THE DESIGN CAPACITY OF BRIDGES, THE ADDITIONAL DISCHARGE MUST NOT EXCEED THE EXPECTED PEAK FLOW SURFACE ELEVATION OF WATERS DURING A ONE HUNDRED (100) YEAR EVENT OR SIGNIFICANTLY CONTRIBUTE

TO AN EXISTING EXCEEDANCE. THIS LIMIT IS ONE (1) FOOT BELOW THE BOTTOM ELEVATION OF THE BRIDGE. AS WITH CULVERTS, EROSION MUST NOT BE ACCELERATED AT THE BRIDGE ABUTMENTS.

Cross culverts must be able to pass a ten (10) year storm flow at no more than 1 pipe diameter water depth. Water in excess of this limit is to be retained behind the road crossing up to a predetermined elevation for a one hundred (100) year storm event. Additions that cause the ten (10)-year event to exceed one (1) pipe diameter or exceed the one hundred (100) year retention elevation will be considered significant.

Impact/ Mitigation

Impact 5.13-1 Peak Flow

AA Since the No Project/Action Alternative will not result in an increase in impervious surfaces the existing surface discharge predictions will remain the same. ***Therefore, the No Project/Action Alternative is not expected to result in a significant impact to the environment.***

AB, AC THE MAXIMUM EXPECTED ADDITIONAL DISCHARGE IS DURING A ONE HUNDRED (100) YEAR, ONE (1) HOUR STORM. HALF OF THE ADDITIONAL PAVED AREA WILL BE CONSTRUCTED ON EXISTING IMPERVIOUS SURFACES LEADING TO NO NET INCREASE OF PEAK DISCHARGE FROM THESE AREAS. HOWEVER, IMPERVIOUS SURFACES PLACED ON TOP OF THE 5.6 ACRE (2.3 HA) TRUST PARCEL, THE RANCHERIA, AND THE NORTHERN CALTRANS RIGHT OF WAY WILL ADD 2.27 ACRES (.92 HA) OF IMPERVIOUS SURFACE AREA AND 1.75 ACRES (.71 HA) OF OTHER ALTERED SURFACES (SLOPES, FILL AREAS, GRADED SWALES, ETC.). THE SOIL IS ALREADY PRONE TO HIGH DISCHARGES DURING STORMS (82% DURING A 2.33 YEAR EVENT ACCOUNTING FOR SLOPES AND LAND COVER), SO THE ADDITIONAL INCREASES AS PART OF THE WEIGHTED AVERAGE ADD TO A NATURALLY HIGH DISCHARGE. THE POST PROJECT WEIGHTED RUNOFF COEFFICIENT IS EIGHTY-FIVE (85), WITH THE PREDICTED CHANGE IN DISCHARGE BEING THREE (3) CFS FOR THE IMPACTED PROJECT AREA DURING A 2.33-YEAR EVENT. THESE ADDITIONAL DISCHARGES AND RESULTING PEAK FLOWS WILL NOT EXCEED THE DESIGN REQUIREMENTS OF THE EXISTING CULVERTS. ***THEREFORE, THE FLYOVER INTERCHANGE ALTERNATIVE DESIGN AND THE DIAMOND***

INTERCHANGE ALTERNATIVE DESIGN ARE NOT EXPECTED TO RESULT IN A SIGNIFICANT IMPACT TO THE ENVIRONMENT.

Mitigation 5.13-1 Peak Flow

None Required

Impact 5.13-2 Structural Alterations To Existing Surface Drainage Patterns

AA Since the No Project/Action Alternative will not result in an increase in impervious surfaces the existing surface discharge predictions will remain the same. ***Therefore, the No Project/Action Alternative is not expected to result in a significant impact to the environment.***

AB THE WEST-BOUND OFF-RAMP WILL LIKELY RESULT IN THE IN FILLING OF THE DRAINAGE CHANNEL FOR DRAINAGE AREA 1 (D1). PRESENTLY, THE WATER IN THIS CHANNEL IS DOWN CUTTING THROUGH THE NATIVE SOILS BEFORE ENCOUNTERING BEDROCK NEAR CULVERT #1. THE DOWN CUTTING BEGINS ON THE NORTHEAST END OF THE WESTBOUND EMERGENCY TURNOUT AND CONTINUES FOR APPROXIMATELY THREE HUNDRED (300) FEET (91 M) REACHING DEPTHS OF UP TO EIGHT (8) FEET (2.4 M). THE CROSS-SECTION FOR THE WESTBOUND RAMP SHOWS A GRADED SLOPE THAT WOULD RESULT IN THIS CHANNEL BEING FILLED. THIS WOULD RESULT IN THE EXISTING DRAINAGE CHANNEL BEING FILLED AND A NEW CHANNEL BEING CONSTRUCTED CLOSER TO PRIVATE PROPERTY. ***THEREFORE, THE FLYOVER INTERCHANGE DESIGN ALTERNATIVE IS EXPECTED TO RESULT IN A SIGNIFICANT MITIGABLE IMPACT TO THE ENVIRONMENT.***

AC THE DIAMOND DESIGN WILL ALTER EXISTING HYDRAULIC GRADIENTS. THESE ALTERATIONS TO THE HYDRAULIC GRADIENTS WILL TRANSFER WATER FROM THE SLATE CREEK WATERSHED TO THE TENNESSEE CREEK WATERSHED. THE ELEVATED OFF-RAMPS AND ROADWAYS WILL LEAVE OPEN SOIL UNDERNEATH. THIS SOIL WILL HAVE DIFFERENT RE-VEGETATION CHARACTERISTICS THAN PRE-PROJECT AND WILL ALTER THE SOIL MOISTURE AND STORM DISCHARGE BUDGET. IF

THE SOIL IS NOT IN OPTIMAL CONDITION TO RECEIVE PRECIPITATION, IT WILL NOT RE-VEGETATE APPROPRIATELY, THEREBY GENERATING ADDITIONAL SURFACE DISCHARGE AND SUSPENDED SEDIMENTS. ***THEREFORE, THE DIAMOND INTERCHANGE DESIGN ALTERNATIVE IS EXPECTED TO RESULT IN A SIGNIFICANT MITIGABLE IMPACT TO THE ENVIRONMENT.***

Mitigation 5.13-2 Structural Alterations To Existing Surface Drainage Patterns

The following mitigation will assure that the proposed project will result is a ***less than significant impact***.

(A) MITIGATION FOR AB INCLUDES INSTALLING A CULVERT FOR THE LENGTH OF THE FILLED IN CHANNEL.

(B) MITIGATION FOR AC INCLUDES RE-VEGETATING WITH APPROPRIATE PLANTS FOR THE CONDITIONS CREATED BY THE RAISED OFF-RAMPS AND ROADWAYS. MITIGATION FOR THE ALTERED HYDRAULIC GRADIENTS IS ADDRESSED BY THE ADDITIONAL DISCHARGE BEING RETAINED IN A DETENTION RESERVOIR ON THE RANCHERIA AFTER CONSTRUCTION OF THE CASINO/HOTEL.

Impact 5.13-3 Impacts To Existing Drainage Structures

AA SINCE THE NO PROJECT/ACTION ALTERNATIVE WILL NOT RESULT IN AN INCREASE IN IMPERVIOUS SURFACES THE EXISTING SURFACE DISCHARGE PREDICTIONS WILL REMAIN THE SAME. ***THEREFORE, THE NO PROJECT/ACTION ALTERNATIVE IS NOT EXPECTED TO RESULT IN A SIGNIFICANT IMPACT TO THE ENVIRONMENT.***

AB INCREASES IN PEAK RUNOFF OF ≤1 CFS, REPRESENTING AN INCREASE OF MUCH LESS THAN ONE PERCENT (1%), ARE EXPECTED TO OCCUR AT THE SLATE CREEK HIGHWAY 50 CULVERT OR AT THE RESERVATION ROAD BRIDGE DURING A ONE HUNDRED (100) YEAR EVENT. THESE ADDITIONS WILL NOT ALTER THE PERFORMANCE OF THE TWO CROSSINGS DURING THE DESIGN STORM. ON-SITE CULVERTS WILL NOT BE IMPACTED BY ADDITIONAL POST-PROJECT DISCHARGES. THE ONLY EXISTING

CULVERT THAT MAY BE IMPACTED BY CONSTRUCTION OF THE FLYOVER DESIGN IS CULVERT 1. BOTH THE OUTLET AND INLET TO THIS CULVERT APPEAR TO BE AFFECTED BY THE CONSTRUCTION OF THE EAST-BOUND ON-RAMP AND THE WEST-BOUND OFF-RAMP, RESPECTIVELY. ACCORDING TO THE ENGINEERED DRAWINGS FOR THE FLYOVER ALTERNATIVE, CUTTING AND FILLING WILL TAKE PLACE ON THIS CULVERT. THE UPPER PORTION OF THE OPEN CONCRETE DRAIN AT THE BASE OF THE HIGHWAY EMBANKMENT IN SUB-BASIN D2 WILL BE ALTERED BY CUTTING AND FILLING ACTIVITIES AS WELL. ***THEREFORE, THE FLYOVER INTERCHANGE DESIGN ALTERNATIVE IS EXPECTED TO RESULT IN A SIGNIFICANT MITIGABLE IMPACT TO THE ENVIRONMENT.***

AC AS WITH THE FLYOVER INTERCHANGE DESIGN, PRELIMINARY DRAWINGS SHOW THAT THE PLACEMENT OF THE EAST-BOUND OFF-RAMP AND THE WEST-BOUND ON-RAMP MAY INTERFERE WITH INLETS AND OUTLETS OF CULVERTS 1 AND 2 THROUGH CUT AND FILL ACTIVITIES OR THE PLACEMENT OF PYLONS AT THESE FEATURES. ***THEREFORE, THE DIAMOND INTERCHANGE DESIGN ALTERNATIVE IS EXPECTED TO RESULT IN A SIGNIFICANT MITIGABLE IMPACT TO THE ENVIRONMENT***.

Mitigation 5.13-3 Impacts To Existing Drainage Structures

The following mitigation will assure that the proposed project will result is a ***less than significant impact***.

(A) Mitigation measures for AB and AC. Although project runoff does not increase flow in Slate Creek at the Reservation Road bridge, impacts at this structure could be lessened by retaining additional flows on-site within the Caltrans ROW or on the 5.6 acre (2.3 ha) trust parcel until the Casino/Hotel is constructed. Once completed, the Casino surface drainage network will remove 3.12 acres (1.3 ha) from Sub-basin D1, somewhat reducing the design discharge.

(B) Mitigation measures for AB. Impacts to Culvert 1 can be mitigated by either replacing the culvert or creating a box entrance at the inlet side and extending the outlet past the on-ramp.

(C) Mitigation measures for AB. Impacts to Sub-basin D2 structures can be mitigated by relocating the open concrete drain within the Caltrans ROW.

(D) Mitigation measures for AC. Impacts to culvert inlet and outlets by construction can be mitigated by placing pylons at least thirty (30) feet (9.1 m) away from the culverts or re-engineering the culvert inlet and outlets to fit the structural needs at the project site.

Impact 5.13-4 Cumulative Impacts To Drainage

AA Under the No Project/Action Alternative, the interchange would not be constructed; therefore, no impact upon Drainage would occur on or around the project site. ***The No Project/Action Alternative will not result in a cumulative impact to Drainage.***

AB, AC The only project specific drainage impact identified is related to an increase in impervious surface, that will result in an increase in flows into culverts. The implementation of Drainage mitigation measures will assure that Alternative B and C will not significantly add to the cumulative impact of flows upon culverts. ***Therefore, no Drainage impacts are anticipated to occur as a result of the proposed interchange project.***

Mitigation 5.13-4 Cumulative Impacts

None required.

Chapter 6 Growth Inducing

6.1 Introduction

CEQA Guidelines (Section 15126. 2 [d]) require that an EIR evaluate the growth inducing impacts of a proposed action. A growth inducing impact is defined by the CEQA Guidelines as an impact that fosters economic or population growth, or the construction of additional housing, either directly or indirectly. Direct growth inducement would result, for example, if a project involved the construction of new housing. Indirect growth inducement would result if a project established substantial new permanent employment opportunities (e.g., new commercial, industrial, or governmental enterprises) or if it would remove obstacles to population growth (e.g., expansion of a waste water treatment plant that could allow more construction in the service area). Under NEPA, an EA must also examine environmental impacts (40 CFR § 1508.9 (b)), including growth inducing effects (40 CFR § 1508.8 (b)).

Growth inducement may constitute an adverse impact if the growth is not consistent with or accommodated by the land use plans and growth management plans and policies for the area affected. Local land use plans provide development patterns and growth policies that guide orderly urban development supported by adequate urban public services, such as water supply, roadway infrastructure, sewer services, and solid waste services. A project that would induce "disorderly" growth (i.e., conflict with the local land use plans) could directly or indirectly cause additional adverse environmental impacts and other public services impacts.

6.2 Setting And Potential Growth Inducing Effects

The project site is located in a rural residential area of El Dorado County nine miles (14.5 km) west of Placerville. The proposed interchange would be constructed for a single purpose - to provide unrestricted access to the Shingle Springs Rancheria. It would not be a through road and would not serve neighboring lands. A unique construction design would prevent connections or access to the south side of Highway 50. Connections would also be precluded by regulation. Off-Rancheria development would not be facilitated by the proposed project. Any future development in the project area or region would continue to be subject to approval by El Dorado County and compliance with any applicable neighborhood covenants, conditions, and restrictions (CC&Rs).

The project would not induce substantial population growth on the Shingle Springs Rancheria, as the interchange is intended to facilitate an economic development project (i.e., hotel and casino complex). There is no housing associated with the proposed project. There

are also a limited number of Tribal members and developable acres on the existing Rancheria.

Construction of the proposed interchange would allow for the development of a hotel and casino complex evaluated under the *Shingle Springs Rancheria Hotel and Casino Environmental Assessment* (AES, 2001) developed for the National Indian Gaming Commission (NIGC). The hotel and casino would be situated on land within the Rancheria that is set aside for commercial purposes. The hotel and casino complex would be constructed on 43.9 acres within the Rancheria boundaries. The plan includes the development of a 250-room, 5-level hotel and a 238,500 square foot casino complex. The environmental effects of the hotel/casino complex have been fully addressed and considered in this separate EA. On-Rancheria impacts mitigated to a less-than-significant level within the EA include water resources, groundwater and surface water quality, air quality, biological resources, water supply, law enforcement, fire protection, and noise. The NIGC has issued a Finding of No Significant Impact (FONSI) for the hotel and casino project.

Indirect growth inducing impacts related to the hotel and casino development consists of job growth and possibly an associated increase in off-Rancheria housing demand. The hotel and casino complex is projected to employ 1,500 employees directly. It is reasonable to assume that some employees will reside in the surrounding communities including Shingle Springs, Placerville, El Dorado Hills, and Folsom. It would be speculative to state exactly where and in what numbers future employees would seek housing. The current residential vacancy rate in El Dorado County is 17.3 percent. Assuming a total of 71,278 housing units within the County, this leaves approximately 12,339 units vacant. However, up to 9,614 of these vacant units have seasonal, recreational or occasional uses (US Census, 2001). This leaves approximately 2,725 units available for renting and/or purchasing.

The Housing Element of the El Dorado County General Plan includes an inventory of land suitable for residential development. The Housing Element identifies a total of 28,199 acres designated as High Density Residential – single-family residential development at densities from one to seven dwelling units per acre. A total of 2,749 acres have been identified as Multi-Family Residential. This designation allows for apartments, condominiums and multi-plexes with densities of seven to 24 dwelling units per acre. Together, high density and multi-family designated vacant lands in El Dorado County could support as many as 263,369 dwelling units (El Dorado County Planning Department, 1996). It should be noted that this figure does not include dwelling units that could be build on acreage with other residential designations including Rural Residential, Low Density Residential and Medium Density Residential.

El Dorado Hills and Shingle Springs have the greatest amounts of proposed residential development in the West Slope region of El Dorado County. A total of 13,800 residential dwelling units are either approved, under construction, or completed. These units account for more than half of 23,705 dwelling units that have been approved in the West Slope region of El Dorado County (EPS, 2000).

Clearly, the amount of existing and currently approved residential developments in the West Slope region of El Dorado County would provide an ample amount of residential opportunities to the employees of the hotel and casino complex. Additionally, it can be assumed that the development of any additional housing within El Dorado County would be subject to approval by County land use plans and ordinances. The County would determine the consistency of proposed housing development with the goals and policies of the El Dorado County General Plan. Therefore, the proposed interchange would not likely induce "disorderly" growth within El Dorado County either directly or indirectly. Other impacts on the socioeconomic character of the surrounding area are evaluated in **Section 5.9.** Other indirect impacts of the proposed interchange are addressed in **Section 9**.

Chapter 7 Cumulative Impacts

7.1 Introduction

The CEQA Guidelines' (*Guidelines* Section 15130(b)) definition of cumulative impacts mirrors the NEPA definition (40 CFR § 1508.7). "Cumulative impacts" refers to the effects of two or more projects that, when combined, are considerable or compound other environmental effects. The California Environmental Quality Act requires that discussions of cumulative impacts reflect the severity of the impacts and their likelihood of occurrence. The CEQA *Guidelines* state that the cumulative impacts discussion does not need to provide as much detail as is provided in the analysis of project-only impacts and should be guided by the standards of practicality and reasonableness.

In addition, Section 15130(b) of the CEQA *Guidelines* identifies that the following three elements are necessary for an adequate cumulative analysis:

- Either a list of past, present, and reasonably anticipated future projects producing related or cumulative impacts, including those projects outside the control of the agency (i.e., the list approach); or a summary of projections contained in an adopted general plan or related planning document designed to evaluate regional or area-wide conditions (i.e., the plan approach). Any such planning document shall be referenced and made available to the public at a location specified by the Lead Agency.

- A summary of expected environmental effects to be produced by those projects. The summary shall include specific reference to additional information stating where that information is available.

- A reasonable analysis of the cumulative impacts of the relevant projects. An Environmental Impact Report (EIR) shall examine reasonable options for mitigating or avoiding any significant cumulative effects of a Proposed Project.

Although the CEQA *Guidelines* only require the use of one method of cumulative analysis (i.e., the list approach or the plan approach), the cumulative analysis in this EIR/EA uses both methods.

7.2 Cumulative Setting

For the purposes of this EIR/EA, the cumulative setting is based on development anticipated under the 1996 El Dorado County General Plan. The cumulative setting also included

consideration of approved and proposed undeveloped projects in the project area. The following projects, which are currently undergoing construction, have been recently approved, or are pending approval, could be expected to affect the number of vehicle trips produced on a local basis. These projects are summarized below.

7.2.1 Shingle Springs Rancheria Hotel And Casino Project

A hotel and casino development has been proposed on the existing Shingle Springs Rancheria. This development has been evaluated under the *Shingle Springs Rancheria Hotel and Casino Environmental Assessment* (AES, 2001) developed for the National Indian Gaming Commission (NIGC). The hotel and casino would be situated on land within the Rancheria that is designated commercial or development reserve. The hotel and casino complex would be constructed on 43.9 acres within the Rancheria boundaries. The plan includes the development of a 250-room, 5-level hotel and a 238,500 square foot casino complex. The environmental effects of the hotel/casino complex have been fully addressed and considered in this separate EA. On-Rancheria impacts mitigated to a less-than-significant level within the EA include water resources, groundwater and surface water quality, air quality, biological resources, water supply, law enforcement, fire protection, and noise. The NIGC has issued a Finding of No Significant Impact (FONSI) for the hotel and casino project.

7.2.2 Highway 50 Improvements

Past, present and future improvements to the Highway 50 transportation corridor have the potential to affect vehicle trips and land use in the project area. Caltrans is constructing High Occupancy Vehicle (HOV) lanes on Highway 50 between Sunrise Boulevard (east of the City of Sacramento) and El Dorado Hills. The environmental document for this project was approved on April 19, 1999. The project is expected to be open for traffic in the spring of 2003 (SACOG, 2001). Although there are currently discussions to provide HOV lanes or six standard lanes in the project area, within this analysis it is assumed that Highway 50 will remain a 4-lane facility in the project area, as improvement to six lanes is considered speculative at this stage. Environmental Consequences of the approved HOV lanes on Highway 50, west of the project area, are included in the discussion of SACOG approved projects provided below.

7.2.3 El Dorado County General Plan

The 1996 El Dorado County General Plan is a 20-year policy guide for the growth and development of the County of El Dorado. The General Plan acts as the overall guiding policy

document for land uses in the County and is the principal tool for evaluating public and private projects. The County's goals and policies with regard to land use are contained in the Land Use Element of the General Plan. State law mandates the Land Use Element. Specifically, California Government Code Section 65302(a) requires the preparation of a land use element which designates the proposed general distribution and general location and extent of the uses of the land for housing, business, industry, and open space, including agriculture, natural resources, recreation, and enjoyment of scenic beauty, education, public buildings and grounds, solid and liquid waste disposal facilities, and other categories of public and private land use. The 1996 El Dorado County General Plan is currently being revised. Revisions to the land use designations in the project area could affect development patterns in the project area. The land use maps developed to date for the revised General Plan however, do not include any substantial changes in the land use designations within the project area.

Environmental consequences may occur as the result of changes to the El Dorado County General Plan. Changes to the General Plan, or the approval of projects inconsistent with the General Plan, may result in inconsistent growth within the County resulting in loss of open space, transportation and public service impacts, water quality, air quality, socio-economic and other impacts. Environmental consequences may also occur as the result of the buildout of planned developments contained in the General Plan; these impacts are currently being evaluated in an EIR developed for the General Plan by the El Dorado County Planning Department.

7.2.4 SACOG

SACOG's Metropolitan Transportation Plan (MTP) includes a range of transportation projects within the Sacramento Metropolitan Area. Projects that are proposed in the MTP include HOV lanes on Highway 50 extended from El Dorado Hills Boulevard to Shingle Springs Road and interchange improvements to Highway 50 in Placerville. These projects will provide improved transportation conditions in western El Dorado County.

Environmental consequences that may occur as the result of these projects are likely to consist of air quality, noise, visual, socio-economic, water quality and growth-inducing impacts. Whether roadway improvements result from growth or cause growth is currently debated. Improvements in roadways can reduce travel time to metropolitan areas, inducing residential development further from employment centers. However, the type of improvements that SACOG has proposed along Highway 50 in western El Dorado County are not anticipated to induce significant growth in El Dorado County. HOV lanes in

particular are designed to raise the number of occupants of vehicles by encouraging carpooling. Increasing the number of vehicle occupants has the potential to significantly reduce the number of cars on roadways and therefore can improve congestion and lower environmental impacts such as pollutant emissions and noise. Further, the developments proposed by SACOG consist of improvements to existing roadways (no new roadways or intersections are proposed), thus limiting the magnitude of the resulting environmental impacts. All SACOG projects are subject to environmental review; significant environmental impacts that may occur as the result of these projects must be mitigated whenever feasible.

7.3 Summary Of Cumulative Impacts

The following is a summary of cumulative impacts related to the Proposed Project by environmental topic as described in Chapter 5.0, Environmental Setting, Impacts, and Mitigation Measures. See Chapter 5.0 for detailed discussions of specific cumulative impacts.

7.3.1 Geology And Soils

Both the Flyover Interchange Design Alternative and Diamond Interchange Design Alternative would result in the excavation of serpentinite. The serpentinite impact is related to air quality emissions (asbestos). Westbound on-ramp and eastbound off-ramp construction would likely encounter serpentinite (at the west end of the interchange project site) if the road cut slopes on either side of the highway require ripping, grading, drilling or excavation. The implementation of Mitigation 5.5-2, identified in Chapter 5.0, will assure that excavation of serpentinite on the project site will not significantly add to the cumulative release of asbestos containing materials. Other development in the project area associated with buildout of the General Plan may result in significant impacts to geology and soils (including excavation of serpentinite, erosion, and exposure of people to geologic hazards), however, no cumulative geologic, soils, or seismic impacts are anticipated to occur as a result of the proposed interchange project.

7.3.2 Transportation/Circulation

Both the Flyover Interchange Design Alternative and Diamond Interchange Design Alternative would result in impacts to cumulative traffic conditions. These impacts are summarized below.

Development of either interchange alternative would create new merge/diverge lanes along US-50 at newly created interchange ramps, thereby increasing peak hour congestion along

US-50 between East Shingle Springs Road and Greenstone Road. The westbound off-ramp is found to operate acceptably at Level of Service (LOS) D for all peak hour scenarios, whereas both on-ramps are projected to operate acceptably at LOS E or better. Therefore, these are considered as less-than-significant impacts, as the threshold for determining a significant impact is LOS F. However, the eastbound off-ramp would operate unacceptably at LOS F for cumulative conditions during both the weekday PM peak hour and Saturday peak hour. This is considered a significant impact. To provide acceptable level of service for the ramp diverge area of the eastbound off-ramp, it would be necessary to provide an eastbound auxiliary lane between the eastbound East Shingle Springs Drive on-ramp and the eastbound off-ramp to the Rancheria. The provision of this auxiliary lane would result in acceptable LOS D or better operation for the eastbound off-ramp during all three peak hour scenarios during the cumulative year. Thus, the provision of this auxiliary lane would reduce the impact of the eastbound off-ramp to a less-than-significant impact.

Development of either interchange alternative would increase peak hour congestion along US-50 between East Shingle Springs Road and Greenstone Road. The freeway is projected to operate acceptably at LOS E or better for both east and west of the proposed interchange along both directions during AM and Saturday peak hour conditions. During the PM peak hour, the freeway is projected to operate acceptably at LOS E or better both east and west of the proposed interchange along the westbound direction, and east of the proposed interchange along the eastbound direction. Therefore, these are considered less-than-significant impacts. However, the freeway is projected to operate unacceptably at LOS F west of the proposed interchange along the eastbound direction during the PM peak hour. Therefore, this is considered a significant impact. The provision of the eastbound auxiliary lane between the eastbound East Shingle Springs Drive on-ramp and the eastbound off-ramp to the Rancheria would result in an acceptable LOS D or better operation. Therefore, the provision of this auxiliary lane would reduce the impact of the freeway LOS west of the proposed interchange along the eastbound direction during the PM peak hour to a less-than-significant impact.

Development of the Diamond Interchange Design Alternative would create two new intersections within the newly created interchange, each of which would experience delays under cumulative conditions. The eastbound ramp intersection would operate at an unacceptable level of service (LOS F) as an unsignalized intersection. Therefore, it is recommended that the two newly created intersections be signalized, and the two signals be coordinated to assure that queues would not develop which would block the westbound ramp intersection. This would provide an LOS of B or better. Therefore, this is considered a less-than-significant impact.

Development of either interchange alternative would create two new on-ramps, which would increase congestion along US-50 during periods when on-ramps experience high volumes, thus warranting ramp metering. Ramp metering at the proposed on-ramps would operate without the queue exceeding the storage length if metering rates of 600 vehicles per hour (vph) for the westbound on-ramp and 285 vph for the eastbound on-ramp are implemented. This would result in a less-than significant impact.

Development of either interchange alternative would add traffic to local roadways within El Dorado County. The Proposed Project was found to not significantly impact any of the local roadways and highways (including SR-49 and SR-193, but excluding US-50) for cumulative conditions on an average weekday. Therefore, this is considered a less-than-significant impact. Additionally, the Proposed Project was found to not significantly impact US-50 within El Dorado County east of El Dorado Hills Boulevard. Therefore, this is considered a less-than-significant impact.

7.3.3 Air Quality

Computer simulation models have been used to estimate project-related carbon monoxide (CO) concentrations under cumulative conditions. Under 2025 Cumulative Plus Project Conditions, the highest 1-hour value is 2.5 parts per million (ppm) and the highest 8-hour value is 1.8 ppm. These concentrations are estimated both northeast of and south of the new interchange. Both the 1-hour value and the 8-hour value under 2025 Cumulative Plus Project Conditions are below the CO air quality standards of 35 ppm and 9 ppm respectively. Since CO concentrations under the 2025 Cumulative Plus Project Conditions are lower than the CO air quality standards, the impact is considered less than significant. Other development in the project area associated with buildout of the General Plan may result in significant impacts to air quality. Impacts such as increased emissions from vehicles and wood burning stoves or fireplaces are likely to increase as development of residential and commercial designated land occurs. However, due to limited air quality impact of the proposed interchange project, it will not result in a significant cumulative impact to air quality.

7.3.4 Noise and Vibration

Both the Flyover Interchange Design Alternative and Diamond Interchange Design Alternative would result in increase in traffic noise levels under cumulative conditions. At two receiver locations, the predicted future cumulative traffic noise levels exceed the Noise Abatement Criteria, which is set at 52 dBA Leq interior or 65 dBA Leq exterior. However, the predicted changes in traffic noise levels at those locations due to the project are about 1 dBA as compared to future No Project/Action conditions, which is less than the 12 dBA

threshold for a substantial increase. Therefore, the Flyover Interchange Design Alternative and the Diamond Interchange Design Alternative are expected to result in a less than significant noise impact. No mitigation is required. However, the Caltrans Protocol requires an analysis of potential noise abatement measures. The analysis revealed that it would not be feasible to provide noise barriers along the Highway 50 right of way for receivers 6 and 7. Therefore no barrier is required.

Other currently planned or approved improvement projects along Highway 50 in the project area are not expected to increase noise and vibration. Other development in the project area associated with buildout of the General Plan may result in significant impacts to noise and vibration due to increased traffic or the development of commercial or residential projects in close proximity to Highway 50 or other roadways. These projects could expose people and structures to significant levels of noise and vibration. However, the limited nature of the proposed interchange project's noise and vibration impacts are not expect to add significantly to other project's impacts. Therefore, no cumulative impacts are expected to result from the proposed interchange project.

7.3.5 Biological Resources

There are no significant cumulative impacts to biological resources. Subsequent projects in the region will be subject to environmental review; any significant effects that may be found to result from other projects will require mitigation to minimize impacts to biological resources. No significant impacts to biological resources resulting from the proposed interchange have been identified. Therefore, the proposed interchange project will not add to cumulative impacts to biological resources.

7.3.6 Visual Resources

The roadway network surrounding the project site is assumed to remain the same for cumulative conditions as currently exist for existing conditions. There are no programmed improvements for Highway 50 for cumulative conditions; therefore, a 4-lane facility is assumed for cumulative conditions in the vicinity of the project site. As development has occurred in El Dorado County, the County has approved commercial developments right up to the right-of-way of Highway 50. Thus, development of commercial or residential land, as designated by the El Dorado County General Plan, may result in significant visual impacts. However, no significant visual impacts resulting from the proposed interchange project have been identified. Therefore, the Flyover Interchange Design Alternative and the Diamond Interchange Design Alternative will not add to altered cumulative conditions for visual resources along the highway.

7.3.7 Socioeconomics

The interchange alternatives will not contribute to significant cumulative effects associated with the displacement of persons or housing. There is only one house that will be affected. This house is currently owned and occupied by Tribal members. This project, considered together with cumulative growth projected in the El Dorado County General Plan, will not result in cumulative displacement of people or housing. The same is true for the socioeconomic character of the surrounding area. The proposed interchange will not prevent people from accessing their properties. Since there are no transportation related cumulative development projects to consider for the project area, no cumulative effects will be experienced. The increased traffic along the roadway network, resulting from cumulative growth, will not prevent the use of adjacent property. Lastly, the proposed interchange will not result in a cumulative effect to minority and/or low-income populations, as no populations in the area are expected to experience adverse impacts as a result of the project. Therefore, the Flyover Interchange Design Alternative and Diamond Interchange Design Alternative are not expected to result in a significant cumulative socioeconomic impact.

7.3.8 Cultural Resources

Construction of the proposed interchange, together with cumulative development projected in the El Dorado County General Plan, may lead to the cumulative loss of undiscovered artifacts. The project will not contribute to the cumulative loss of historic resources. The Flyover Interchange Design Alternative and the Diamond Interchange Design Alternative may contribute to the cumulative loss of previously undiscovered artifacts. Implementation of Mitigation 5.10-1 (See Section 5.10) would reduce the cumulative impact to a less than significant level. Development of commercial or residential land, as designated by the El Dorado County General Plan, may result in the loss of cultural resources. However, because the proposed interchange project, as mitigated, will not result in a significant impact to cultural resources, the project will not result in a significant cultural resource impact.

7.3.9 Hazardous Materials

There are no significant cumulative impacts related to hazardous materials. Subsequent projects in the region will be subject to environmental review; any significant effects that may be found to result from other projects will require mitigation to minimize impacts with regards to hazardous materials. No significant impacts to biological resources resulting from the proposed interchange have been identified. Therefore, the proposed interchange project will not add to cumulative impacts concerning hazardous materials.

7.3.10 Water Quality

The only project specific water quality impact identified is related to an increase in impervious surfaces, which will result in an increase in total runoff volumes. The water quality impact is related to an increase in total runoff volumes. The implementation of Best Management Practices (BMPs) will assure that the Flyover Interchange Design Alternative and the Diamond Interchange Design Alternative will not significantly add to the cumulative addition of roadway contaminates impacting water quality. Other development in the project area associated with buildout of the El Dorado County General Plan, or development of Highway 50 improvements may result in significant impacts to water quality. However, no significant impacts to water quality resulting from the proposed interchange have been identified. Therefore, no cumulative water quality impacts are anticipated to occur as a result of the proposed interchange project.

7.3.11 Drainage

The only project specific drainage impact identified is related to an increase in impervious surfaces, which will result in an increase in flows into culverts. The implementation of Mitigation 5.13-2 and 5.13-3 will assure that the Flyover Interchange Design Alternative and the Diamond Interchange Design Alternative will not significantly add to the cumulative impact of flows upon culverts. Other development in the project area associated with buildout of the El Dorado County General Plan, or development of Highway 50 improvements may result in significant increases in impervious surfaces and runoff flows. However, no significant impacts to drainage resulting from the proposed interchange have been identified. Therefore, no cumulative drainage impacts are anticipated to occur as a result of the proposed interchange project.

Chapter 8 Significant Unavoidable Adverse Impacts

8.1 Introduction

The California Environmental Quality Act (CEQA) Section 21100(b)(2) requires that any significant and unavoidable effect on the environment must be identified. In addition, Section 15093(a) of the CEQA *Guidelines* allows the decision-making agency to determine if the benefits of a proposed project outweigh the unavoidable adverse environmental impacts of implementing the project. Caltrans can approve a project with unavoidable adverse impacts if it prepares s "Statement of Overriding Considerations" setting forth the specific reasons for making such a judgment. However, as shown in Chapter 5.0 of this EIR/EA, the No Project/Action Alternative (AA), Flyover Interchange Design Alternative (AB) and Diamond Interchange Design Alternative (AC) will not result in any significant and unavoidable adverse impacts to the environment. Therefore, a statement of overriding considerations for significant unavoidable impacts associated with the interchange project is not necessary.

Chapter 9 Indirect Effects

9.1 Introduction

CEQA Guidelines (Section 15358(2)) defines indirect effects as effects "…which are caused by the project and are later in time or farther removed in distance, but are still reasonably foreseeable. Indirect or secondary effects may include growth-inducing effects and other effects related to induced changed [sic] in the pattern of land use, population density, or growth rate, and related effects on air and water and other natural systems, including ecosystems." For purposes of this EIR/EA, Indirect Effects include the development of the proposed hotel and casino on the Rancheria. If constructed, the proposed interchange (direct subject of this EIR/EA) will allow free and open access to the Rancheria thereby allowing the opportunity for development consistent with the Tribe's Land Use Plan. The foreseeable consequence of interchange construction is the construction of the hotel and casino on the Rancheria.

The following indirect effects are tiered and incorporated by reference from the *Final Environmental Assessment: Shingle Springs Rancheria Hotel and Casino Project, El Dorado County, California* (AES, 2001), Copies of this document are available for review at the locations identified in Section 1.4.4 of this document.. The National Indian Gaming Commission (NIGC) was the federal Lead Agency, and the BIA was the Cooperating Agency for the Final EA, which addressed the effects of the construction and operation of the proposed hotel and casino. It should be noted that the discretionary action taken by the NIGC, which necessitated NEPA compliance, was the approval of the proposed Gaming and Management Contract – not the land use plan. The land use plan that allows for the construction of this commercial development on the Rancheria was previously approved by the Shingle Springs Tribal Government. The Finding of No Significant Impact (FONSI) was approved by the NIGC in January 2002.

9.2 Indirect Effects Of Providing Access To Rancheria

9.2.1 Topography

While development of the hotel and casino site would involve grading and cut and fill activities, these construction activities were determined not to result in significant effects to slope stability or landform. The stable characteristics of the bedrock materials limit the risk of geologic hazards including slope failure; slumping, subsidence and rock fall. The development of the proposed

hotel and casino complex will comply with the Uniform Building Code (UBC) per the requirements of the Tribal-State Compact.

9.2.2 Geology

The Final EA found that the hotel and casino project would require the necessary grading activities to construct level building pads for foundations and parking lots associated with the complex. The Final EA includes a grading plan that will be implemented during construction activities. The Final EA concluded that the geology effect will be less-than-significant given the existing geology (i.e., meta-volcanics) of the hotel and casino site, the fact that hillside cuts will be designed at appropriate slopes as to preclude slope failure and fill areas will be engineered to support loads with minimal settlement, and that a grading plan will be implemented.

The Final EA also found that the Grading and excavation required to construct the proposed hotel and casino complex, and interchange, could encounter bedrock that could contain chrysotile and tremolite, the varieties of serpentine that constitutes a potentially harmful form of asbestos. As series of measures designed to minimize the potential effects of asbestos were approved by the NIGC for the hotel and casino project. These measures included implementation of Chapter 8.44 of Title 8 of the El Dorado Ordinance Code entitles “Naturally Occurring Asbestos and Dust Protection Ordinance.” The implementation of this, and other measures, was found to reduce the potential asbestos effects to less than significant.

9.2.3 Soils

Appendix G of the Final EA contains the geographic extent of grading proposed by the hotel and casino project. A measure approved by the NIGC is the compliance with the erosion and stormwater provisions included in Appendix G of the Final EA. In short, the grading will conform to El Dorado County Ordinance 15.14.020-760. The soils on the project site are classified as relatively non-expansive having low shrink-swell potential. The Final EA found that the natural condition of the soil, in connection with standard engineering design practices such as pre-construction geotechnical studies would minimize effects due to expansive soil conditions. Furthermore, the hotel and casino project will be required to comply with the provisions of the UBC per the requirements of the Tribal-State Compact. The NIGC concluded that the hotel and casino would result in a less-than-significant effect given the fact that development will occur on relatively non-expansive soils; will comply with El Dorado County Grading, Erosion and Sediment Control Ordinance; will comply with applicable provisions of the UBC; and will follow the construction specifications found in Appendix G of the Final EA.

9.2.4 Seismicity

The Final EA found that groundshaking could potentially result in damage and temporary closure of the facilities, freeway interchange, and portions of the access roadway. However, the Final EA found that construction would be required to comply with engineering recommendations in accordance with seismic requirements of Zone 3 of the current UBC and the California Building Code (Title 24) additions (per the requirements of the Tribal-State Compact). Given the required compliance with the UBC and Caltrans design criteria, structures will be designed to withstand seismic shaking from an earthquake on the regional active and potentially active faults. Therefore, the NIGC found that seismic shaking would not result in a significant effect.

9.2.5 Surface Water and Drainage

The Final EA found that the conversion of 28.90 acres of land from open space to impervious surfaces will result in both increased peak flow and increased total discharge coming off of the developed site during wet weather events. The Final EA also concluded that surface drainage of the project site would be altered due to construction activities resulting in minor changes to existing surface runoff patterns.

Measures proposed by the Tribal Government and imposed by the NIGC to assure a less than significant effect include the development of an on-site detention basin to assure that no net increases in storm flow downstream of the project site will result. The surface drainage pipes will also be sized to contain the 100-year storm event based on the El Dorado County Drainage Manual. Lastly, a series of oil/grease/sediment traps will assure that water quality is maintained. The NIGC concluded that the hotel and casino project would have a less than significant effect on surface water and drainage.

9.2.6 Flooding

The Final EA found that the entire hotel and casino project area is outside of the FEMA designated flood zone and the increased discharge from the project area represents a minor fraction of total area in the respective larger watersheds. The Final EA also concluded that the hotel and casino project is not expected to result in either an on-site or off-site flooding effect. This is due to the fact that the development includes an oversized surface runoff detention facility that will capture and detain the increased flows resulting from the projects impervious

surfaces. The NIGC concluded that the hotel and casino project would have a less than significant effect on flooding.

9.2.7 Groundwater

The Final EA concluded that water delivery options to the proposed hotel and casino do not include groundwater extraction; therefore, water delivery will not affect groundwater resources.

The onsite wastewater treatment plant will comply with Title 22 standards that specify redundancy and reliability features. The Final EA documented that the wastewater treatment plant effluent quality will meet the following effluent constituent requirements: Biochemical Oxygen Demand < 1 mg/l; Total Suspended Solids 0 mg/l; Ammonia-N <0.2 mg/l; Nitrate 8 mg/l; Total Coliform < 2.2 MPN/100 mL; Turbidity <0.1 NTU (Appendix E). The water produced by this treatment system is very highly treated and poses no health risks.

Given the treatment and disposal system proposed, the soil will not "treat" raw wastewater resulting from the hotel and casino. The wastewater will be treated to Title 22 standards within the proposed wastewater treatment plant prior to be discharged to the SDI area. To further assure that an impact to groundwater resources does not occur, the Tribe will site, locate, and regularly monitor groundwater-monitoring wells up gradient, down gradient, and in the center of the SDI area. Therefore, the NIGC found that a less than significant effect to groundwater would result from the hotel and casino project.

9.2.8 Water Quality

The Final EA states that all construction activities associated with the hotel and casino complex will be undertaken outside of known watercourses and features. The Tribal Government will voluntarily comply with El Dorado County's Grading, Erosion and Sediment Control Ordinance. Lastly, the Tribe is required to adhere to the provisions of the Clean Water Act. The Tribe will submit an application for a National Pollutant Discharge Elimination System (NPDES) General Permit for Construction Activities issued by the EPA (Region IX) and adhere to all guidelines therein. As required by the Permit, the Tribe will create and implement a Storm Water Pollution Prevention Program (SWPPP), which outlines Best Management Practices (BMP's). The Notice of Intent (NOI) for the General Permit and the SWPPP will be formulated and enacted prior to construction activities. The SWPPP will also be kept on site for the duration of all construction. Given the above elements of the project and required permits, the NIGC found that the hotel and casino would result in a less than significant effect to water quality.

9.2.9 Air Quality

The air quality impacts associated with traffic from the proposed hotel and casino are analyzed within Section 5.5 of this EIR/EA. The analysis contained within Section 5.5 also addresses increases in existing Rancheria traffic under cumulative conditions based on a one percent annual growth rate in Rancheria traffic volumes.

Other indirect air quality effects have been addressed in the Final EA. The Final EA found that construction related activities on the project site (e.g., grading and excavation) may result in the disturbance of asbestos containing rock and soil. This potentially significant effect will be reduced to a less-than-significant level by complying with the measures listed in Section 6.3.1 of the Final EA. Measures include compliance with the intent of Chapter 8.44 of Title 8 of the El Dorado County Ordinance Code, "Naturally Occurring Asbestos and Dust Protection Ordinance." Section 8.44.030 of this ordinance specifically addresses "General Requirements for Grading, Excavation and Construction Activities." Additional measures include detailed construction practices to reduce fugitive dust, creation of a Health and Safety Plan, employee training, air monitoring, and the voluntary implementation of the Air Pollution Control District's (APCD) Rules 215,224,229 and 300. Based on the ability of these measures to reduce air quality impacts, The NIGC concluded that effects to air quality are less than significant.

9.2.10 Biological Resources

Wetlands / Jurisdictional Waters

The Final EA found that no U.S. waters would be directly affected (i.e., filled) by the project. The NIGC required compliance with the final provisions of an approved NPDESA permit to assure that effects to wetlands were less than significant.

Special Status Species

California Red-Legged Frog

The Final EA found that the hotel and casino project was unlikely to result in impacts to dispersal habitat, as the project footprint is located upon a ridge and is not positioned between perennial water sources. In addition, the project footprint is surrounded by relatively steep ground and dense vegetation, thereby further reducing the likelihood that dispersing frogs would be impacted. Based on these factors, The NIGC concluded that direct effects to red-legged frog are less than significant. The NIGC also concluded that indirect downstream effects would be less than significant with the implementation of NPDES and other water quality control measures.

Valley Elderberry Longhorn Beetle

The NIGC concluded that the hotel and casino project would have no effect upon the valley elderberry longhorn beetle since no elderberry shrubs occur in or around the project footprint.

Layne's Butterweed

The Final EA found that no potential habitat for this species occurs on the Rancheria. Therefore, the NIGC concluded that the hotel and casino project will not have an effect upon this species.

Nesting Raptors

The Final EA did document the existence of mixed oak woodland habitat within the project site that provides suitable nesting habitat for raptor species such as Cooper's hawk, red-shouldered hawk, red-tailed hawk, and great horned owl. Although no raptor nests were observed during visits to the site, nests could become established prior to the initiation of future construction activities. To address these issues, the NIGC has required measures to ensure that this species will not be adversely affected by the project.

9.2.11 Cultural Resources

The Final EA found negative results during both the records search and the field survey. Therefore, the NIGC concluded that development of the hotel and casino site would not affect any prehistoric or historic sites.

9.2.12 Socioeconomic Conditions

The Final EA found that the construction costs of the proposed facility is expected to result in a revenue stream into the economy totaling approximately $83.7 million dollars. Following construction, the forecasted annual revenue from the hotel and casino complex is expected to be $194 million dollars in the first year of operation. Of the gross amount, $88.4 million will be expended in providing gaming, food and beverage, and lodging services, $22.2 million will be expended as compact payments, and $83.4 million will account for net income.

The Final EA also states that the Tribal Government will contract with service providers for fire and emergency medical service, solid waste service, and police service. Therefore, the NIGC concluded that no net fiscal impact is anticipated due to the fact that the Tribal Government will contract for these identified services.

The Final EA found that the hotel and casino will benefit the Tribe in at least two ways. First, it will generate substantial new income to be managed by the Tribal Government. Second, tribal

members will have access to 1,500 new jobs created by the casino. Household income will rise substantially, and unemployment will decrease as a result.

The hotel and casino complex is projected to generate about $60 million annually for the Tribe. According to IGRA, net revenues from tribal gaming are to be used for the following purposes: (i) to fund tribal government operations or programs; (ii) to provide for the general welfare of the Indian tribe and its members; (iii) to promote tribal economic development; (iv) to donate to charitable organizations; or (v) to help fund operations of local government agencies.

Substantial research has been conducted on the social costs associated with gambling across the nation, most recently in a report issued by the National Gambling Impact Study Commission (NGISC, 1999). The NGISC commissioned companion reports on the issues of pathological or compulsive gambling and increased local crime by the National Research Council (NRC) and National Opinion Research Center (NORC). The NGISC could find no convincing evidence that legalized gambling increased pathological or compulsive gambling, or that local crime rates increased significantly. In its report the NGISC provided an in-depth analysis of the impacts of gambling in the U.S. generally, and also specifically addressed the impacts of Native American Tribal gambling. In this report, as study (Jay S. Albanese, Ph.D., Professor and Chair, Department of Criminal Justice, Virginia Commonwealth University. *Casino Gambling and White Collar Crime: An Examination of the Evidence* presented at *Gambling and Gaming: Winners or Losers?* (April 30, 1999), p.32) by the chair of the Department of Criminal Justice at Virginia Commonwealth University is quoted as follows:

> *An examination of arrest trends for embezzlement, forgery and fraud in nine of the largest casino markets shows no consistent pattern, although more jurisdictions report more decreases than increases in arrests.*

The NGISC Final Report also cites a study by a former director of the Illinois State Police, who also served as assistant U.S. attorney for the Northern District of Illinois. This study, Casinos and Crime: *An Analysis of the Evidence* (December 1997) found that there is little relationship between casinos and crime. On page 7-14, the *National Gambling Impact Study Commission Final Report* concludes that:

> *Taken as a whole, the literature shows that communities with casinos are just as safe as communities that do not have casinos.*

Environmental Justice for Minority and Low Income Populations

The Final EA found that the nearest residential communities in close proximity of the project site are neither low income nor minority. No adverse effects to low-income populations and minority populations would occur as a result of the Proposed Action. The NIGC found that the hotel and casino project will have a positive effect on the financial well being of the low-income and minority population of the tribal members.

9.2.13 Transportation

The issues associated with transportation are addressed within Section 5.4 of this EIR/EA. The analysis contained within that section assumes traffic resulting from the hotel and casino. As such, there are no further indirect transportation effects.

9.2.14 Land Use

The Final EA stated that the Tribe amended its land use and zoning ordinances to accommodate the placement of the proposed hotel and casino complex on the existing Rancheria. The land identified for the hotel and casino project are designated as Commercial under the Tribe's Land Use Plan. There are no inconsistencies with the El Dorado County Land Use Plan since their plan does not apply to the Rancheria.

9.2.15 Public Services

Water Supply

The Final EA found that the hotel and casino complex would result in a estimated peak water demand of approximately 98,000 gallons per day (gpd), while the estimated average water demand is 75,700 gpd. To meet the water demand estimated for the hotel and casino facility, the Tribal Government would employ one of two options: (1) use of existing El Dorado Irrigation District (EID) 3-inch diameter water meter, or (2) trucking water to the project site. Under Option #1, the NIGC requires that the Tribal Government provide NIGC with a written EID agreement prior to connection and use of the existing 3-inch meter. Under Option #2 the NIGC is requiring that the Tribal Government provide a final agreement between the Tribe and Aeropure Water, or another comparable company, to provide water delivery to the site. Given the above measures, a less than significant water supply effect was concluded by NIGC.

Wastewater Service

The Final EA found that the required capacity of the wastewater treatment facilities and effluent reuse/disposal facilities is estimated to be 200,000 gpd to allow for the treatment of predicted peak flows. The Tribe is proposing the use of a "Membrane Bio Reactor" (MBR) wastewater treatment plant. The MBR handles variations in flow better than typical activated sludge systems.

The intent is to utilize as much treated effluent as possible as reclaimed or recycled water in a manner that is environmentally sound and within the California Title 22 requirements. The Tribal Government will dispose of excess treated wastewater through a recycled water supply system and a subsurface irrigation/disposal (SID) method. Although the water will be treated to California Title 22 requirements, Title 22 requirements do not apply for subsurface application.

A storage reservoir at an elevation of 1,595 feet asl will be constructed to provide 1.8 million gallons of recycled water storage. This reservoir will be lined and covered to minimize the possibility of infiltration and evaporation. Of the storage volume, 500,000 gallons will be used to meet the facilities emergency fire needs. The remaining 1.3 million gallons will be available for reuse in landscaping, or non-consumptive uses in the hotel and casino. Given the above information, and the information contained in Appendix E of the Final EA, the NIGC found that no wastewater impacts will occur with the operation of the hotel and casino complex.

Solid Waste

Waste generated from the main facility (facility minus hotel) is expected to consist of typical commercial waste. Using a solid waste calculation rate 2.5 pounds/100square feet/day, the waste generation resulting from the main facility is estimated to be 7,000 pounds per day or 3.50 tons per day. Using a solid waste calculation rate 3.7 pounds/day/person and assuming that each of the 250 rooms is occupied with two people simultaneously (worst case assumption), the waste generation resulting from the Hotel facility is estimated to be 1,850 pounds per day or 0.925 tons per day. Both facilities combined expect to generate 4.425 tons per day or approximately 1,615 tons per year. The casino/hotel facility will employ trash compactors on-site, which will increase dumpster capacities and decrease the frequency of pick-ups by El Dorado Disposal Company.

The El Dorado Disposal Company currently provides solid waste service to the Rancheria and indicates that the Rancheria would enter into an agreement with the company to extend service to the gaming facility. The NIGC has concluded that the hotel and casino project will not result in a significant solid waste impact.

Electricity, Natural Gas, and Telecommunications

The Final EA states that the project site is currently serviced with electrical and phones and will not be connected to natural gas. The Final EA concluded that the hotel and casino project will in no way jeopardize PG&E's ability to serve the remainder of the County. The Final EA did find that additional transmission lines will most likely be required to serve the hotel and casino project. The Tribe will coordinate with the Pacific Bell Engineering Division to ensure that the necessary transmission lines and/or facilities are built to adequately serve the Proposed Action. Contingent upon coordination with Pacific Bell, the hotel and casino is not expected to impact Pacific Bell's ability to serve the remainder of the County. Therefore, the NIGC found that the hotel and casino project will result in a less-than-significant effect.

Law Enforcement

The operation of the hotel and gaming facilities under the Proposed Action may result in law enforcement demands that include, but are not limited to, in-house security needs, auto theft/burglary, illegal loitering, and traffic control issues. Consistent with Section 8.0 of the Tribal-State Compact, the Tribe will provide on-site security for operations concerning the hotel and casino complex. Under Public Law 280, the State of California and other local law enforcement agencies have enforcement authority over criminal activities on Tribal land.

The Tribal Government may enter into a formal service agreement or Memorandum of Understanding (MOU) with the El Dorado County Sheriff's Department that will address criminal issues. The details of this agreement are not known at this time; however, a letter from Sheriff Hal Barker to the Tribal Government states that the El Dorado County Sheriff's Office and the Shingle Springs Rancheria Gaming Commission have established a dialog to address the need for enhanced law enforcement services. The conclusion of the letter from Sheriff Barker states "We intend to continue with regular meetings in an effort to construct an action plan in anticipation of the Rancheria's opening of class III gaming operations with related activities."

In addition, the following features will be included into the operation of the facility by the Tribe:

- Provide trained security staff to handle security issues within the hotel and gaming facility during operating hours. All security guards will carry two-way radios so as to respond to back up and emergency related calls. This will aid in the prevention of criminal activity within the hotel and gaming facilities.

- All parking areas will be well lit and monitored by parking, and/or roving security guards at all times during operation. This will aid in the prevention of auto theft and other related criminal activity.
- Areas surrounding the hotel and gaming facilities will have "No Loitering" signs in place, will be well lit and will be patrolled regularly by roving security guards. This will aid in the prevention of illegal loitering and all crimes that relate to illegal loitering.
- The Tribe will provide traffic control with appropriate signage and the presence of peak-hour traffic control staff. This will aid in the prevention of off-site parking, which could create possible security issues.

The NIGC has concluded that the above features will assure a less than significant effect.

Fire Protection

The Final EA found that there are several benefits that the hotel and casino project would provide in terms of fire protection. The new interchange and access road would allow for quicker response time due to the improved access to the Rancheria. Fire equipment would no longer need to travel a circuitous route through the Grassy Run neighborhood to get to their destination. The route to the Rancheria would be directly from US 50, through the 5-acre parcel, and then to the Rancheria. Additionally, the 6-ton weight limit associated with the existing bridge would no longer be an issue, which would allow heavy equipment to access the Rancheria.

Measures have also been incorporated into the hotel and casino project to address the wildfire issues during construction and operation of the proposed facilities. The hotel and gaming facilities will be designed to comply with Uniform Building Codes and the Tribe will be given a certificate of occupancy by the Tribal Gaming Agency once construction is complete. The hotel and casino would be fitted with monitored automatic fire sprinkler systems. The facility will be constructed to meet adequate fire flow requirements. The Final EA also states that the Tribal Government will expand its current fire station to provide a fire department to provide fire protection to the proposed casino. Therefore, the NIGC concluded that a less than significant fire effect.

Emergency Medical Service

The NIGC concluded that the hotel and casino will result in an increased demand for emergency medical services that will be met by Marshall Hospital, as well as regional facilities located in the greater Sacramento area. Calls to 911 are dispatched to the nearest available ambulance.

Ambulances are stationed in Diamond Springs. Local emergency medical services will be provided by the Fire Department created by the Tribal Government. The Fire Department will hire and train Emergency Medical Technician (EMT) personnel in accordance with California Department of Health Standards. A Rescue/Medic unit will be provided that complies with the US Department of Transportation Standards for design and equipment. Therefore, the NIGC concluded that the hotel and casino project would result in a less than significant emergency medical effect.

9.2.16 Noise

The traffic related noise effects of the hotel and casino project have been addressed within Section 5.6 of the EIR/EA. The hotel and casino project will include other noise sources, primarily traffic and human activities in parking lots, use of fans for heating and ventilation (HVAC), and truck loading/unloading areas. The NIGC has imposed measures on the project to assure that HVAC noise is reduced to a less than significant level (e.g., siting requirements, design specifications, etc.). Additionally, the NIGC conditioned the project to shield loading docks, and locate loading docks away from sensitive receptors. Lastly, the NIGC is requiring that construction noise be mitigated through compliance with Caltrans standard specifications Section 7-1.011. Given the above measures, the NIGC has concluded that on-Rancheria noise effects would be less than significant.

9.2.17 Hazardous Materials

The Final EA found that there was no reportable hazardous materials contamination at or near the project site. The use of hazardous wastes and/or materials associated with the hotel and casino will be required to comply with the provisions of the Tribal/State Compact. Therefore, the NIGC concluded that the hotel and casino will result in a less than significant hazardous materials effect.

9.2.18 Visual Resources

The Final EA states that the hotel structure will be 5 stories tall and 60 feet in height above ground elevation. The casino (including parking structure) will have a base elevation of 1,410 feet above sea level (asl) with a peak roof elevation of 1,525 feet asl. Therefore, the casino structure will extend approximately 115 feet above existing grade (northeast view). However, the elevation at the main entrance to the casino (southwest side of the facility) is at 1,485 feet asl giving the casino a maximum elevation from the southwest view of 40 feet. This elevation is 78 feet below the hill immediately south and southwest of the casino which is at elevation 1,603 feet asl. The southwest off-Rancheria view of the Casino will be blocked by both the hill and

undisturbed oak woodland on the western edge of the development bordering Koto Road. Views of the casino from northeast of the Rancheria will be blocked by a wooded ridge within the Rancheria that has a peak elevation of approximately 1,560 feet asl, 35 feet above the maximum elevation of the casino. Views of the development to the south of the Rancheria will be blocked by an on-Rancheria hill with a peak of 1,603 feet asl, 48 feet above the peak of the hotel, and the wooded ridge continuing southeastward from the hill to the cutbank on the north side of US 50, which has a face of approximately 50 feet in height. Views of the hotel and casino from the north of the Rancheria will be partially blocked by the Proposed Action leaving in place native woodland on the northwest corner of he development envelope. Only parcels due north of the west end of the hotel and casino may be able to see the casino if their view is not interrupted by trees which it will be after taking into account the native oak woodland that will be left on the northwest corner of the project site. Given the above information, and the fact that a screen of trees will be retained along the perimeter of the development, the NIGC concluded that a less than significant effect would result from the hotel and casino project.

Chapter 10 Report Preparation, Consultation and Coordination

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Chapter 11 Acronyms

A

Above Sea Level (asl)
American National Standards Institute (ANSI)
American Society of Testing and Materials (ASTM)
Auburn very rocky, silt loam (AxD)
Auburn very rocky, silt loam (AxE)

B

Best Management Practices(BMPs)
Bureau of Indian Affairs (BIA)

C

California Air Resources Board (CARB)
California Code of Regulations (CCR)
California Department of Fish and Game (CDFG)
California Department of Transportation (Caltrans)
California Department of Transportation Highway Design Manual (HDM)
California Division of Mines and Geology (CDMG)
California Environmental Quality Act (CEQA)
California Endangered Species Act (CESA)
California-Federal Operations Group (Ops)
California Highway Patrol (CHP)
California Native Plant Society's (CNPS)
California Occupational Safety and Health Administration (Cal/OSHA)
California Transportation Commission (CTC)
Clean Water Act (CWA)
Code of Federal Regulations (CFR)
Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA)
Cubic Feet Per Second (cfs)

D

Department of Toxic Substances Control (DTSC)
Department of Transportation (DOT)
DO dissolved oxygen

E

El Dorado County Air Pollution Control District (APCD)

Endangered Species Act ESA
Environmental Assessment EA
Environmental Impact Report EIR

F

Federal Endangered Species Act (FESA)
Federal Highway Administration (FHWA)
Federal Occupational Safety and Health Administration (Fed/OSHA)
Finding of No Significant Impact (FONSI)
FWCA Fish and Wildlife Coordination Act
FWS U.S. Fish and Wildlife Service

I

Indian Reservation Roads (IRR)
Initial Site Assessment (ISA)
International Electrotechnical Institute (IEC)

H

Hazardous and Solid Waste Act (HSWA)
Hazardous Materials Plan (HMP).
Hazardous Waste Control Law (HWCL)
Hazardous Waste Management Plan (HWMP)

L

Larson Davis Laboratories (LDL)
Levels of Service (LOS)

M

Memorandum of Understanding (MOU)
Metropolitan Transportation Plan and Transportation Improvement Program (MTP/MTIP)
mg/L milligrams per liter
million acre-feet (MAF)
Mineral Resource (MR)
Mineral Resource Zones (MRZ)
Modified Mercalli Intensity (MMI)

N

National Contingency Plan (NCP)
National Emissions Standard for Hazardous Air Pollutants (NESHAP)
National Environmental Policy Act (NEPA)

Natural Environment Study (NES)
National Historic Preservation Act (NHPA)
National Indian Gaming Commission (NIGC)
Notice of Preparation (NOP)
Nuclear Regulatory Commission (NRC)

O

Office of Emergency Services (OES)

P

Parts per million (ppm)
Parts per thousand (ppt)
Project Study Report (PSR)

R

Regional Water Quality Control Board (RWQCB)
Resource Conservation and Recovery Act (RCRA)
Right-Of-Way (ROW)

S

State Water Resources Control Board (SWRCB)
Superfund Amendments and Reauthorization Act (SARA)

U

Uniform Building Code (UBC)

Chapter 12 References

Analytical Environmental Services, 2001. Preliminary Environmental Analysis Report. Route 50: El Dorado County Between Shingle Springs Drive and Greenstone Road. July 2001.

Analytical Environmental Services, 2001. Shingle Springs Rancheria Hotel and Casino Environmental Assessment, Sacramento, CA.

Analytical Environmental Services, 2001. Shingle Springs Rancheria Interchange Technical Studies. August 2001.

Archaeological Inventory Survey of Teichert's 1500-acre Gravel Extraction Project Area near Lincoln, Placer County, California. 1995. Report on File, North Central California Information Center, CSU-Sacramento.

Association of Bay Area Governments (ABAG). *The San Francisco Bay Area -- On Shaky Ground*, Supplement Report (Excerpts). <http://www.abag.ca.gov/bayarea/eqmaps/mapsba.html>.

Bolt, B. "*Earthquakes,"* W.H. Freeman and Company, New York, New York, 1988.

Boyd, Robert S. 1995. The Pine Hill Fremontia in Fremontia, a Jounal of the California Native Plant Society. Vol 13 No. 1.

Bryant, B. 2000. Personal communication. California Building Standards Commission, *California Building Code, Title 24, Part 2*, 1995.

California Air Resources Board (CARB). Ambient Air Quality Standards Chart. http://www.arb.ca.gov/aqs/aqs.htm.

California Department of Conservation, Division of Mines and Geology. 1998. *Locations of Ultramafic Rocks and Faults in El Dorado County Where Serpentine Rock and Asbestos May Occur*. Map showing ultramafic rock areas and major faults released by DMB in 1998

California Department of Fish and Game. 2001. *California Natural Diversity Data Base*. November, 2001.

California Department of Transportation (Caltrans). 1988. Air Quality Technical Analysis Notes. Sacramento, CA.

California Department of Transportation (Caltrans). 1989 revised. CALINE 4 - A Dispersion Model for Predicting Air Pollutant Concentrations Near Roadways. FHWA/CA/TL-84/15. Sacramento, CA.

California Department of Transportation (Caltrans). 1995. *Environmental Handbook Volume 1.* California Department of Transportation, Environmental Program. March 6, 1995.

California Department of Transportation (Caltrans). 1995. *Highway Design Manual.*

California Department of Transportation, Environmental Program. 1995. *Environmental Handbook Volume 1*, *Ver. 15, Environmental Process, Procedures, and Documentation*. March 6, 1995.

California Department of Transportation (Caltrans). California Seismic Hazard Map and accompanying text. 1996. <http://www.dot.ca.gov/hq/esc/earthquake engineering/Seismology/HzrdMap96.pdf >.

California Department of Transportation (Caltrans). 1997. Community Impact Assessment. Caltrans Environmental Handbook Volume 4. June 1997.

California Department of Transportation (Caltrans). 1999. *Project Development Procedures Manual*, Chapter 18 - Hazardous Waste. July 1, 1999.

California Department of Transportation (Caltrans), 2001. Project Study Report. On Route 50 in El Dorado County Between Shingle Springs Drive and Greenstone Road. October 2001.

California Department of Transportation (Caltrans). 2001. *Statewide Stormwater Management Plan.* Resolution No. 2001-070, adopted May 17, 2001.

California Department of Transportation (Caltrans). 2001. *Water Quality Planning Tool.* Accessed July 27, 2001, <http://stormwater.water-programs.com/webdata/stdsdist.asp?firstunit=514.31>.

California Division of Mines and Geology (CDMG) 1984. *Mineral Land Classification of the Shingle Springs 15-Minute Quadrangle*, 1984

California Division of Mines and Geology (CDMG). 1997. *Guidelines for Evaluating the Hazard of Surface fault Rupture*, CDMG Note 49, 1997.

California Division of Mines and Geology (CDMG). 1997. *How Earthquakes Are Measured*, CDMG Note 32, 1997.

California Division of Mines and Geology (CDMG). 1999. *Seismic Shaking Hazard Maps of California*, 1999.

California Employment Development Department, 2001. *Monthly Labor Force Data For Counties* November 2000. <http://www.calmis.ca.gov/file/lfhist/0011rcou.txt> (12/14/01)

California Gold Camps. 1975. University of California Press. Berkeley.

California Native Plant Society. 2001. The Inventory of Rare and Endangered Vascular Plants of California. Sixth edition.

California River Assessment (CARA). 1999. South Fork of the American River webpage of the California River Assessment. Accessed November 12, 1999, <http://endeavor.des.ucdavis.edu/wpi/ProjectDescription.asp?ProjectPK=3220>.

Central Valley Regional Water Quality Control Board (RWQCB). 1998. *The Water Quality Control Plan (Basin Plan) for the California Regional Water Quality Control Board Central Valley Region.* Fourth edition.

Clark, William B. 1970 Gold Districts of California. California Division of Mines, Bulletin 193. San Francisco, California.

Corrales, Mark, Michael Grant and Evelyn Chan. 1996. *Indicators of the Environmental Impacts of Transportation: Highway, Rail, Aviation, and Maritime Transport*. Prepared for the U.S. Environmental Protection Agency by Apogee Research, Inc., EPA 230-R-96-009, October 1996.

Economic & Planning Systems, Inc.(EPS), 2000. *El Dorado County WRIT Land Use Scenario*. Berkeley, CA.

EIP Associates. 1991. Preserve Sites and Preservation Strategies for Rare Plant Species in Western El Dorado County.

El Dorado County Air Pollution Control District. 1993. El Dorado County California Clean Air Act Plan. Placerville, CA.

El Dorado County, 1993. El Dorado County Drainage Manual.

El Dorado County. 1995. County of El Dorado Drainage Manual. Resolution No. 67-95, Adopted March 14, 1995.

El Dorado County, El Dorado County General Plan, December 1995.

El Dorado County, 1996. El Dorado County General Plan. January 1996.

El Dorado County, 1996. El Dorado County General Plan Land Use Map. January 1996.

El Dorado County Environmental Management Department, Air Pollution Control District (APCD). 2000. Prescriptive Standard. Fugitive Dust Prevention and Control Plan and Contingent Asbestos Hazard Dust Mitigation Plan. April 17, 2000.

El Dorado County. 2001. Assessor's Office, 2001. Information Regarding Assessors Parcel Number 319-110-17. August 2001.

El Dorado County, 2001. El Dorado County General Plan Land Use Map - 2001 Project Description. August 2001.

El Dorado County. 2001. Advanced Planning Division, 2001. Zoning Map of Project Area Updated to 10-09-2001. October 2001.

El Dorado County, 2001. General Information Regarding Public Schools. El Dorado County Home Page. <http://www.eldoradocounty.org/schools.html>.

El Dorado County, 2001. Office of Education. Personal Contact. November 20, 2001.

El Dorado County, California County Code. Title 8, Health and Safety, Chapter 8.38 Hazardous Materials. January 23, 2001.

El Dorado County, California County Code. Title 8, Health and Safety, Chapter 8.44 Asbestos and Dust Protection. January 23, 2001.

El Dorado County Chamber of Commerce, 2001. El Dorado County Demographics. December 13, 2001. <http://www.eldoradocounty.org/demographics.html>

El Dorado County Economic Development Department, 2001. El Dorado County Labor. January 11, 2001. <http://www.co.el-dorado.ca.us/economic/labor.html>

El Dorado County General Plan Update Draft Environmental Impact Report. December 1994.

El Dorado County General Plan. SCH #94012008. Adopted January 23, 1996.

El Dorado County, Grading, Erosion, And Sediment Control Ordinance*, August 1991.*

El Dorado County Planning Department, 1996. Housing Element of the El Dorado County General Plan.

El Dorado County Planning Department, 2001. Personal Contact. September 12, 2001.

Elsasser, Albert B. 1960. The Archaeology of the Sierra Nevada in California and Nevada. University of California, Archaeological Survey Report No. 51. Berkeley.

Environmental Science Associates, January, 2001, Environmental Assessment: Shingle Springs Rancheria- 5 Acre Fee-to-trust Transfer project and Hotel and Casino Project, El Dorado County, California

Federal Emergency Management Agency, 1999, Flood Insurance Rate Map 06004 0725 B

Fernandez, Trish, and Leslie Fryman
1999 Positive Archaeological Survey and Historic Resource Evaluation Report for the Bass Lake Grade Truck Climbing Lane Project on State Route 50, Eldorado County, California. Report on File, North Central Information Center, CSU-Sacramento.

Gene E. Thorne & Associates, Inc., July, 2001, Preliminary Drainage Report for Shingle Springs Rancheria

Gudde, Erwin G.
1969 California Place Names: The Origin and Etymology of Current Geographical Names. University of California Press. Berkeley.

Hart, E. W., *Fault-Rupture Hazard Zones in California: Alquist-Priolo Special Studies Zones Act of 1972 with Index to Special Studies Zones Maps,* California Division of Mines and Geology, Special Publication 42, 1990, revised and updated 1997.

Heizer, Robert F. 1938 "*A Folsom-Type Point from the Sacramento Valley*." The Masterkey 12(5):180-182. Los Angeles.International Conference of Building Officials, Uniform Building Code, ICBO, Whittier, California, 1994, revised 1997.

Hickman, James C. Editor. 1993. The Jepson Manual: Higher Plants of California.

Institute of Transportation Studies, University of California, Davis. 1996. Transportation Project-Level Carbon Monoxide Protocol. UCD-ITS-RR-97-2 1. Davis, CA.

Jagoda, Dennis, Caltrans District 3, Hydraulic Engineer, August 10, 2001, Personal Communication

Jennings, C. W., *Fault Activity Map of California and Adjacent Areas*, California Division of Mines and Geologic Data Map No. 6, 1:750,000, 1994.

Jensen, Peter M. 1996. Archaeological Inventory Survey, 290-ac Didion Subdivision Project Area near Shingle Springs, Eldorado County, California. Report on File, Eldorado County Planning Department and North Central California Information Center, CSU-Sacramento.

Johnson, J. and Steven Stearns. 1977. The Archaeological and Historical Survey of the Shingle Springs Rancheria, Eldorado County, California. Prepared for the Department of the Interior, National Parks Service, Bureau of Indian Affairs. Report on File, North Central Information Center, CSU-Sacramento.

Kipping, J. 1990. Botanical survey for Rare Plants for the Proposed Big Canyon Ranch subdivisions, El Dorado County, California. Unpublished Document.

Kroeber, A. L. 1925 Handbook of the Indians of California. Smithsonian Institution, Bureau of American Ethnology Bulletin 78. Washington, D.C.

Kuchler, A. W. 1977 "Map of the natural vegetation of California," IN, M.G. Barbour and J. Major, Editors., Terrestrial Vegetation of California. John Wiley & Sons: New York.

Kyle, Douglas E. (ed.). 1990. Historic Spots in California. Stanford University Press. Stanford.
Loyd, R.C., and others, "Mineral Land Classification of the Placerville 15-Minute Quadrangle, El Dorado and Amador Counties, California", California Department of Conservation, Division of Mines and Geology, Open-file report 83-29, 1983

Mc Donald, Chad, Analytical Environmental Services, Environmental Specialist, July 12, 2001, Field Observations

M.Cubed, 2000. Socio-Economic Impacts on El Dorado County and the Shingle Springs Band of the Miwoks from the Proposed Shingle Springs Casino and Hotel Complex. February 2000.

Moratto, Michael. .1984. California Archaeology. Academic Press, New York.

Murry, Jeff. 2000. Rancheria Resident. Personal Communication.

National Gambling Impact Study Commission, 1999. National Gambling Impact Study Commission Final Report. June 1999.

National Indian Gaming Commission, 2001. Final Environmental Assessment. Shingle Springs Rancheria Hotel and Casino Project. El Dorado County, California. September 2001.

Peterson, M.D., Bryant, W.A., Cramer, C.H., 1996. *Probabilistic Seismic Hazard Assessment for the State of California*, California Division of Mines and Geology Open-File Report issued jointly with U.S. Geological Survey, CDMG 96-08 and USGS 96-706, 1996.

Peterson, M.D., et.al. 1999. *Seismic Shaking Hazard Maps of California*, California Division of Mines and Geology, Map Sheet 48, 1999.

Riddell, Francis A. 1978. Maidu and Konkow, IN, Handbook of North American Indians, Volume 8: California, Robert F. Heizer, Editor, pp. 370-379. Smithsonian Institution, Washington, D.C.

Rhoads, Keith, Caltrans District 3, Project Manager, August 9, 2001, Personal Communication

Sacramento Area Council of Governments. 1999. Metropolitan Transportation Plan, July 15, 1999. <www.sacog.org/mtp/finalmtp.pdf> .

Sacramento Area Council of Governments. 2001. State Transportation Improvement Program – Project Delivery Report, June 30, 2001. <www.sacog.org/publications/projectdelivery.pdf> (12/28/01).

Sacramento Area Council of Governments (SACOG), 2001. Census Data for El Dorado County at <www.sacog.org > October 2001.

Sacramento Bee, 2001. Water Plans Lead to Lawsuit. El Dorado County Supervisors Challenge the Irrigation District Over a Storage Tank Proposal. November 21, 2001.

Sacramento Metropolitan Air Quality Management District. 1994. Air Quality Thresholds of Significance. Sacramento, CA.

Shingle Springs Rancheria, 2001. Comments from Public Viewings on the Proposed Interchange. March-April 2001.

Shingle Springs Rancheria. 2001. *Phase I Environmental Site Assessment*. Fee-to-Trust Parcel. Environmental Science Associates. December 8, 2001

Shingle Springs Rancheria. 2001. *Phase I Environmental Site Assessment*. Proposed Casino Site Environmental Science Associates. December 8, 2001

Snelcher, Matt, El Dorado County, Department of Transportation, Engineer, August 9, 2001, Personal Communication

Springs Rancheria Access Road, Eldorado County, California. Report on File, North Central Information Center, CSU-Sacramento

State of California Department of Finance, 2001. General Information Taken From Demographic Research Unit at <www.dof.ca.gov>.

State of California Employment Development Department, 2001. Labor Market Information for El Dorado County at <www.edd.ca.gov>.

Tribal Data Resources, 1999. Shingle Springs Rancheria Tribal Demographics Summary. November 1999.

United States Census Bureau, 2001. Summary Statistics for the 1990 Census. October 2001.

United States Census Bureau, 2001. *Summary Statistics for the 2000 Census.* <http://factfinder.census.gov/servlet/BasicFactsServlet>.

United States Army Corps of Engineers, 1990, HEC-1 Flood Hydrograph Package

United States Department of Agriculture, Soil Conservation Service, 1974, Soil Survey of Western El Dorado County

United States Department of Agriculture, Soil Conservation Service,, June, 1986, Urban Hydrology for Small Watersheds: Technical Release 55 (TR55)

United States Department of the Interior, 1986. National Register of Historic Places. Federal Register. Washington, D.C. Supplements through 12/31/00.

United States Department of Interior, 1999. Indian Labor Force Report. Bureau of Indian Affairs, Office of Tribal Services. 2001.

United States Environmental Protection Agency (EPA). 1993. Guidance Specifying Management Measures for Sources of Nonpoint Pollution in Coastal Waters. US EPA, Office of Water, Washington, DC.

United States Environmental Protection Agency (EPA). 2000. 1998 California Section 303(d) List and TMDL Priority Schedule.

United States Fish and Wildlife Service. 1999. Federally Listed and Proposed Endangered Plants of California.

United States Geological Survey, 988, 7.5 minute Shingle Springs Topographic Quadrangle

Wilson, J. 1996. Master's Thesis: A Study of Plant Species Diversity and Vegetation Patterns Associated with the Pine Hill Gabbro Formation and Adjacent substrata, El Dorado County, California.

Wilson, Norman L., and Arlean H. Towne
1978 Nisenan, IN, Handbook of North American Indians, Volume 8:
California, Robert F. Heizer, Editor, pp. 387-397. Smithsonian Institution, Washington, D.C.

Windmiller, Rick,. 1996. Cultural Resources Inventory and Statement of No Effect, Shingle

Youngdahl & Associates, Inc. 1999. *Hydrogeologic Report for Shingle Springs Rancheria Hotel/Casino Complex*. Prepared for Environmental Science Associates. October 25, 1999.

Youngdahl & Associates, Inc., 2000. Onsite Wastewater Disposal Feasibility Study for Shingle Springs Rancheria Casino Project. January 2000.