



CITY OF SHASTA LAKE

MOUNTAIN GATE AT SHASTA AREA PLAN DRAFT ENVIRONMENTAL IMPACT REPORT

Prepared for:
CITY OF SHASTA LAKE
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APRIL 2014



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1.0 INTRODUCTION

1.1 BACKGROUND AND PURPOSE

The City of Shasta Lake, acting as the lead agency, has prepared this Draft Environmental Impact Report (DEIR) to provide the public and responsible and trustee agencies with information about the potential environmental effects of implementing the Mountain Gate at Shasta Area Plan (project; proposed project), which includes a General Plan Amendment, Rezone, Tentative Subdivision Map and Development Agreement. The California Governor's Office of Planning and Research State Clearinghouse number for this project is SCH 2012-042010.

In 1981, a prior property owner, Peri Properties (Peri), proposed a much more intensive project on the subject property, which included 1,150 single- and multi-family housing units, a 10-acre school site, 60 acres of commercial uses, a 27-hole golf course, clubhouse, cocktail lounge, restaurant, and similar retail and service-commercial uses, and 51 acres of open space. The Shasta County Board of Supervisors (Board) certified an Environmental Impact Report for that project and approved a General Plan Amendment and Specific Plan on July 26, 1983.

An amendment to the Specific Plan was approved by the Board on May 15, 1990, to redesign the original layout of various commercial and residential land uses, add commercial areas, reduce the size of the golf course from 27 to 18 holes, and add a 200-room lodge. At that time, the applicant also requested a subdivision of the property to create 562 lots for construction of detached single-family dwelling units, 12 parcels for commercial and multi-family development (588 units), two open space parcels, and one large parcel that would accommodate the golf course. The Tentative Map was also approved at that time.

On January 12, 1993, Peri entered into an agreement with the Shasta Dam Area Public Utilities District (SDAPUD) for joint development of the property, and 230 acres of the property was transferred to the SDAPUD for the sole purpose of developing the golf course. Following the city's incorporation on July 2, 1993, all prior agreements between Peri and the SDAPUD were assigned to the City. The City was not successful in obtaining the required environmental permits, including a permit from the US Army Corps of Engineers, and was unable to develop the golf course. A Settlement Agreement between Peri and the City was executed on July 3, 1997, and ownership of the golf course property was transferred back to Peri. The approved Tentative Map for the project expired on March 8, 1998, and no further actions related to development of the property occurred until 2005.

In 2005, a project similar to the Mountain Gate at Shasta project was proposed on this property (SCH#2005102074). An Initial Study/Notice of Preparation (IS/NOP) was circulated from October 21, 2005, to November 21, 2005, and a scoping meeting was held on November 9, 2005. Most of the technical studies were completed and an Administrative Draft Environmental Impact Report was prepared. However, the DEIR for the project was neither fully completed nor circulated publicly, and the original project applicant is no longer involved.

This proposed project is smaller in terms of housing units and commercial space than the 2005 submittal. Since the previous project was not approved, this new project will be the sole project included in this DEIR, and no comparison between the 2005 project and this proposed project will be included in the documentation except as needed to support the use of previously prepared technical studies.

As described in California Environmental Quality Act (CEQA) Guidelines Section 15121(a), an EIR is a public information document that assesses the potential environmental effects of the proposed project and identifies mitigation measures and alternatives to the proposed project that could reduce or avoid significant adverse environmental impacts. Public agencies are

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charged with the duty to consider and minimize significant environmental impacts of proposed development where feasible, and have an obligation to balance a variety of public objectives, including economic, environmental, and social factors.

The CEQA Guidelines require the preparation of an environmental impact report prior to approving any “project” that may have a significant effect on the environment. The term “project” refers to the whole of an action that has a potential for resulting in a direct physical change or a reasonably foreseeable indirect physical change in the environment (CEQA Guidelines Section 15379[a]). With respect to development of the proposed project, the City has determined the development is a “project” that has the potential for resulting in significant environmental effects.

1.2 TYPE OF DOCUMENT

This DEIR includes both a programmatic analysis of the overall proposed project (Area Plan and Planned Development zoning) and a project-specific environmental analysis for the Tentative Subdivision Map (21 large-lot subdivision parcels).

The CEQA Guidelines identify several types of EIRs, each applicable to different project circumstances. CEQA Guidelines Section 15060 identifies different types of EIR documents that can be tailored for specific circumstances and that lead agencies may use other variations of EIR documents to meet their needs. As discussed below, a program EIR is appropriate for land use decision-making at a broad level that contemplates further, site-specific review of individual development proposals. Project EIRs are appropriate for specific proposed projects that will not require additional site-specific environmental review.

PROGRAM EIR (PROGRAM-LEVEL ENVIRONMENTAL ANALYSIS)

A program EIR has been prepared that evaluates the requested actions as they relate to the proposed overall land use designations (refer to Section 3.0, Project Description, for further detail on the overall proposed project). These actions include:

- General Plan Amendment: (1) Land Use Element Amendment for a portion of the property to Mixed Use; (2) Circulation Element Plan Line Amendment that changes the location of the southern connection of the Wonderland Boulevard extension to Cascade Boulevard rather than to Shasta Way.
- Rezone to Planned Development to reflect the proposed project.
- Tentative Subdivision Map to create 21 large lots designed for future re-division and to establish the location of the north-south roadway connecting Wonderland Boulevard to Cascade Boulevard.
- Adoption of an Area Plan that establishes density and location of land uses throughout the proposed project site.
- Development Agreement that sets forth the property owner’s obligations related to the construction and financing of infrastructure and public services, including financial contributions for infrastructure maintenance.

The program-level analysis considers the broad environmental effects of the overall plan for the project site, such as impacts on circulation and traffic, water quality, biological resources, land use compatibility, air quality, and major utilities. In addition, the program-level analysis addresses the cumulative impacts of development of the proposed project.

The City anticipates that the proposed project will be constructed in separate phases of development as shown in **Figure 3.0-6**. In order to move forward with a specific phase, the project applicant will be required to submit a Tentative Subdivision Map and/or development site plan for each phase. At that time, the City will prepare a site-specific analysis of the development phase's impacts, particularly with respect to that phase's compliance with the analysis set forth in the DEIR (CEQA Guidelines Sections 15168 and 15183).

PROJECT EIR (PROJECT-LEVEL ENVIRONMENTAL ANALYSIS)

The EIR also includes a more detailed project-level analysis of the initial phase of the proposed project, which is a Tentative Subdivision Map creating 21 large lots and identifying the basic roadway network and infrastructure plans. (Refer to Section 3.0, Project Description, for further detail of the proposed project components.) The development proposal for this phase of the proposed project contains enough specificity to conduct a site-specific, project-level environmental review and will allow consideration of the Tentative Subdivision Map.

1.3 INTENDED USES OF THE DEIR

This DEIR has been prepared in accordance with the California Environmental Quality Act. The DEIR is intended to evaluate the environmental impacts of the Mountain Gate at Shasta Area Plan project to the greatest extent possible. This DEIR, in accordance with CEQA Guidelines Section 15126, should be used as the primary environmental document to evaluate all planning and permitting actions associated with the project. Permitting entitlements include, but are not limited to, the following:

CITY OF SHASTA LAKE DISCRETIONARY ACTIONS – CURRENTLY REQUESTED

- General Plan Amendment to change approximately 118 acres of Suburban Residential and approximately 23 acres of Urban Residential High land use designations to Mixed Use.
- Rezone from Planned Development-Specific Plan (PD-SP) to the Mountain Gate at Shasta Planned Development (PD) zone district designed to implement the Area Plan.
- Tentative Subdivision Map to divide 590 acres into 21 large parcels designed for later re-division in support of the Area Plan.
- Adoption of the Mountain Gate at Shasta Area Plan that provides a land use design and potential for up to 1,604 housing units and up to 195,584 square feet of nonresidential land uses, with a full complement of services, facilities, and utilities as well as 249 acres of open space, parks, and trails.
- Development Agreement that sets forth property owners' obligations related to the construction and financing of infrastructure and public services, including financial contributions for infrastructure maintenance.

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CITY OF SHASTA LAKE DISCRETIONARY ACTIONS – ANTICIPATED, BUT NOT CURRENTLY REQUESTED

- Subsequent Tentative Subdivision Maps
- Conditional Use Permits and Administrative Permits consistent with the Planned Development zone district
- Encroachment Permits
- Grading Permit(s)

CITY OF SHASTA LAKE ANTICIPATED FUTURE MINISTERIAL ACTIONS

- Final Map(s)
- Improvement plans including an Erosion Control Plan and Vegetation Management Fuel-Mitigation Plan
- Building Permit(s)
- Demolition Permit(s)
- Zoning / Site Development approval for permitted nonresidential and multiple-family residential uses within the Area Plan

PERMITS GRANTED BY OTHER AGENCIES AND ENTITIES

- Regional Water Quality Control Board (RWQCB) Permit, Waste Discharge Permit, National Pollutant Discharge Elimination System (NPDES) Permit, Stormwater Pollution Prevention Program (SWPPP), and Water Quality Certification or Waiver, under Sections 401 and 402 of the Clean Water Act (CWA)
- US Army Corps of Engineers (USACE) approval of permits under Section 404 of the Clean Water Act
- Encroachment Permit(s) from the California Department of Transportation (Caltrans) for work within their right-of-way
- Encroachment Permit(s) from Shasta County for work within their right-of-way or jurisdiction
- California Department of Fish and Wildlife (CDFW) Streambed Alteration Agreement
- Air Pollution Control Permits pursuant to the Shasta County Air Quality Management District's rules and regulations
- The project may require service agreements with or permits from local utility providers or special service districts, including, but not limited to, Pacific Gas and Electric (PG&E), the Shasta Lake Fire Protection District, and the Gateway Unified School District (GUSD).

KNOWN RESPONSIBLE AND TRUSTEE AGENCIES

As defined in the CEQA Guidelines, the term “responsible agency” includes all public agencies other than the lead agency that have discretionary approval power over the project or an aspect of the project. The following agencies are identified as potential responsible agencies:

- Regional Water Quality Control Board
- California Department of Fish and Wildlife
- US Fish and Wildlife Service (USFWS)
- National Marine Fisheries Service
- US Army Corps of Engineers
- Shasta County Air Quality Management District
- Shasta County Public Works Department
- California Department of Transportation

According to the State of California, a “trustee agency” is a state agency having jurisdiction by law over natural resources affected by a project. The California Department of Fish and Wildlife is the only trustee agency applicable to the proposed project.

1.4 RELATIONSHIP TO THE CITY OF SHASTA LAKE GENERAL PLAN

The City of Shasta Lake adopted and certified the City of Shasta Lake General Plan (General Plan) and Environmental Impact Report (EIR) in June of 1999 (SCH#98112019). The General Plan is the City’s overall guide for the physical use of the City’s resources, expresses the development goals of the community, and is the foundation upon which all land use decisions are made. In this DEIR, the policies that affect this project are described in the appropriate analysis section.

1.5 ORGANIZATION AND SCOPE

Sections 15120 through 15132 of the CEQA Guidelines identify the content requirements for Draft and Final EIRs. An EIR must include a brief summary of the proposed actions and its consequences, a project description, a description of the environmental setting, an environmental impact analysis of all phases of the project, mitigation measures, alternatives, significant irreversible environmental changes, growth-inducing impacts, and cumulative impacts. The environmental issues addressed in this DEIR were established through review of environmental documentation developed for the site, environmental documentation for nearby projects, public comments and public agency responses to the Notice of Preparation (NOP), and direction given by the City Council. Based on these comments, agency consultation, and review of the project application, the City determined the scope for this DEIR.

Sections 4.1 through 4.13 in this DEIR provide an integrated presentation of the setting, environmental impacts, and mitigation measures. 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. Consistent with CEQA Guidelines Section 15183, this DEIR addresses

1.0 INTRODUCTION

environmental effects that apply to the project and utilizes mitigation measures that are based on adopted City development policies and standards to mitigate anticipated impacts.

Cumulative environmental effects of the proposed project are generally based on information provided in the General Plan and General Plan EIR, with identification of the project's contribution to the cumulative condition and updated information on the cumulative setting based on currently approved and proposed development projects in the city. The DEIR also relies on other long-range planning tools, such as the Shasta County Regional Travel Demand Model, to help evaluate cumulative impacts.

1.6 ORGANIZATION OF THE DEIR

This DEIR has been organized in the following format:

- **Section 1.0, Introduction.** An introduction and overview describing the intended use of the DEIR and the review and certification process.
- **Section 2.0, Executive Summary.** An impact summary presenting the significant DEIR findings in tabular form.
- **Section 3.0, Project Description.** A description of the Mountain Gate at Shasta Area Plan, General Plan Amendment, Planned Development zone district, and Tentative Subdivision Map.
- **Section 4.0, Environmental Setting, Impacts and Mitigation Measures.** An analysis of potentially significant impacts associated with each of the identified issue areas, with mitigation measures for identified potentially adverse impacts.
- **Section 5.0, Alternatives to the Project.** CEQA Guidelines Section 15126.6 requires that an EIR describe a range of reasonable alternatives to the project that could feasibly attain the basic objectives of the project and avoid and/or lessen the environmental effects of the project.

CEQA Guidelines Section 15126.6(f)(1) states that the range of alternatives to be analyzed is governed by a “rule of reason,” which allows only those alternatives necessary to permit a reasoned choice to be examined. Factors that may be taken into account when addressing the feasibility of alternatives include site suitability, economic viability, availability of infrastructure, General Plan consistency, other plans or regulatory limitations, jurisdictional boundaries, and whether the project proponent can reasonably acquire, control, or otherwise have access to the alternative site.

The alternatives analysis provides a comparable analysis between the project and selected alternatives, which include:

- **Alternative 1 – No Project.** CEQA Guidelines Section 15126.6(e)(3) requires a discussion of the “no project” alternative, which would usually proceed along one of two lines.
 - When the project is the revision of an existing land use or regulatory plan policy or ongoing operation, the no project alternative will be the continuation of the existing plan, policy, or operation in the future.

- If the project is other than a land use or regulatory plan, the no project alternative is the circumstance under which the project does not proceed.

Under the no project alternative, development of the project site would not occur as proposed in the Area Plan. Because the City of Shasta Lake General Plan requires an Area Plan for development, another Area Plan would be required before development could occur. As with the proposed project, any Area Plan for the property would require its own environmental analysis. Approximately 118 acres of the site are designated Urban Residential and Suburban Residential, which could develop without an Area Plan. Potential buildout of the areas currently designated for development is discussed in Alternatives Eliminated from Further Consideration in Section 5.0, Alternatives, of this EIR.

- **Alternative 2 – Black Canyon Road Connection.** During the NOP comment period and scoping meeting, several residents along Black Canyon Road expressed concern about connection of the project to this roadway. They were concerned about traffic and noise on a roadway that is in poor condition. The proposed project would allow only pedestrian and emergency vehicle access and does not consider vehicle access as part of the traffic analysis. From a planning perspective, additional vehicle access would help integrate this project into the existing community. This alternative would also reduce impacts at the newly proposed Cascade Boulevard intersection at the southerly boundary of the site.
- **Alternative 3 – Reduced Wetland and Oak Tree Impact Alternative.** This alternative would reduce the development footprint of the proposed project to avoid the jurisdictional wetlands and reduce impacts to oak trees within the project boundaries. This alternative would not allow residential development in several of the development areas. As the commercial and nonresidential areas of the proposed project are located in areas that would not affect waters of the United States or oak trees, the alternative would allow for the same amount of nonresidential development as the proposed project. Overall, this alternative results in less area available for residential development and results in fewer potential residential units.
- **Alternatives Considered but Eliminated from Further Consideration.** In addition to the alternatives analyzed, alternative locations for the proposed project were considered but rejected because there are no suitable sites that the project proponent could reasonably acquire, control, or otherwise have access to which would achieve the project objectives. Including additional commercial land within the project to achieve a jobs/housing balance was rejected because other features are included within the boundaries of the project site to more effectively reduce vehicle miles traveled (VMTs) such as trails, sidewalks, bike lanes, and linkages between residential, commercial, and public uses.
- **Section 6.0, Other Evaluations Required by CEQA.** This section discusses the cumulative impacts associated with the proposed project. As required by CEQA Guidelines Section 15130, an EIR shall discuss cumulative impacts of a project when the project's incremental effect is cumulatively considerable. This section also contains required discussions and analysis of various topical issues mandated by the CEQA Guidelines, including cumulative impacts, significant environmental effects that cannot be avoided if the project is implemented, and growth-inducing impacts.

1.0 INTRODUCTION

- **Section 7.0, Report Preparers.** This section includes a listing of report preparers, contributors, and individuals and agencies consulted during the preparation of this DEIR.
- **Appendices.** This section includes all notices and other procedural documents pertinent to the DEIR, as well as all technical reports prepared to support the analysis. To save reproduction and distribution costs and to be more energy and resource efficient, the DEIR and technical appendices are included on a CD at the back of this document. Hard copies of the documents can be reviewed at City Hall, 1650 Stanton Drive, and the Shasta Lake Gateway Library, 1646 Stanton Drive, Shasta Lake, California.

1.7 ENVIRONMENTAL REVIEW PROCESS

The review and certification process for the DEIR includes the following procedural steps:

NOTICE OF PREPARATION

In accordance with Section 15082 of the CEQA Guidelines, the City of Shasta Lake prepared a Notice of Preparation (NOP) of a DEIR on April 4, 2012. The NOP is presented in **Appendix 1.0-1**. This Notice of Preparation was sent to 51 public agencies. The Office of Planning and Research assigned this project State Clearinghouse number 2012042010. The public comment period commenced on April 4, 2012, and ended on May 3, 2012. A notice was circulated to the public, local, state, and federal agencies, and other interested parties to solicit comments on the proposed project. A public scoping meeting on the Notice of Preparation was conducted on Monday, April 16, 2012, at 6:00 PM at the John Beaudet Community Center, 1525 Median Avenue, Shasta Lake, California. Concerns raised in response to the NOP were considered during preparation of the DEIR and are presented in **Appendix 1.0-2**.

DRAFT EIR

This document constitutes the Draft EIR (DEIR). The DEIR contains a description of the project, description of the environmental setting, identification of project impacts, and mitigation measures for impacts found to be significant, as well as an analysis of project alternatives. Upon completion of the DEIR, the City will file the Notice of Completion with the State Office of Planning and Research to begin the 60-day public review period (Public Resources Code Section 21161).

PUBLIC NOTICE/PUBLIC REVIEW

Concurrent with the Notice of Completion, the City will provide public notice of the availability of the DEIR for public review and will invite comment on the DEIR. All interested parties should provide the City of Shasta Lake with the contact information for any specific group or organization wishing to receive the DEIR for public review. Prior to consideration of the proposed project, the City will conduct a public hearing on the DEIR. Public comment on the DEIR will be accepted in both written and oral form at a public hearing. Notice of the time and location of the public hearing will be published in the Notice of Availability. All comments should be addressed to:

Carla L. Thompson, AICP, Development Services Director

City of Shasta Lake
1650 Stanton Drive
Shasta Lake, CA 96019
Phone: (530) 275-7460
E-mail: cthompson@cityofshastalake.org

RESPONSE TO COMMENTS/FINAL EIR

Following the public review period, a Final EIR (FEIR) will be prepared. The FEIR will respond to written comments received during the public review period and to oral comments made at the public hearing.

CERTIFICATION OF THE DRAFT EIR

The City of Shasta Lake Planning Commission and City Council will review and consider the FEIR prior to their decision to approve or conditionally approve the proposed project. If the City finds that the FEIR is “adequate and complete” and meets the requirements of CEQA Guidelines Sections 15090 and 15091, the City will certify the FEIR at the public hearing.

PROJECT CONSIDERATION

Upon review and consideration of the FEIR, the City may consider action on the proposed project. A decision on the project application will be accompanied by written findings in accordance with CEQA Guidelines Section 15091 and, if applicable, Section 15093.

MITIGATION MONITORING AND REPORTING PROGRAM

As required by the CEQA Guidelines, the City will also adopt a Mitigation Monitoring and Reporting Program (MMRP) for mitigation measures that have been incorporated into or imposed on the project to reduce or avoid significant effects on the environment. This MMRP will be designed to ensure measures are carried out during project implementation by all responsible parties.

1.8 COMMENTS RECEIVED ON THE NOTICE OF PREPARATION

The City of Shasta Lake received the following comment letters on the Notice of Preparation for the DEIR. A copy of each letter is provided in **Appendix 1.0-2**.

- California Department of Transportation
- City of Redding Development Services Department
- Northeast Information Center
- Shasta County Department of Resource Management, Air Quality District
- Shasta County Department of Resource Management, Planning Division
- Shasta Lake Fire Protection District

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- Shasta Lake Electric Utility Department
- Shasta Lake Public Works Department
- Celeste Draisner
- Ed Coleman
- Cliff Jacoby
- Stephen Morgan
- Brad Dupre
- Unknown (2)

1.9 DEFINITIONS OF COMMONLY USED TERMS

The following definitions are provided to describe components of the project and to set forth terminology used throughout this document:

TERMS

Applicant – Any person or other legal entity who applies to the City to develop or improve any portion of the real property within the project boundaries. The term “applicant” includes all successors in interest.

- **Area Plan** – As required by planned development provisions of the General Plan. The Comprehensive Master Plan for this project includes a General Development Plan and Tentative Subdivision Map. Area Plan in this context refers to the Mountain Gate at Shasta Area Plan (see **Appendix 3.0-1**).
- **CEQA** – State of California Public Resources Code Sections 21000–21189.3 (California Environmental Quality Act).
- **CEQA Guidelines** – State of California Code of Regulations, Title 14, Chapter 3, Sections 15000–15387 (Guidelines for California Environmental Quality Act).
- **Developer** – Any person or other legal entity who converts the project site to urban uses. Such activities include, but are not limited to, grading, building construction, and installation of infrastructure.
- **DEIR** – Draft Environmental Impact Report for the proposed Mountain Gate at Shasta Area Plan.
- **FEIR** – Final Environmental Impact Report for the proposed Mountain Gate at Shasta Area Plan.
- **General Plan** – City of Shasta Lake General Plan as adopted in June 1999 with goals, policies, and programs currently in effect.
- **Planned Development (PD)** – A zone district adopted pursuant to Title 17.62 of the Shasta Lake Municipal Code. The full text of the PD for this project is included as **Appendix 3.0-2**.

- **Project** – The development or improvement of the project site, as defined by the project application.
- **Project Area** – The real property described by the project applicant.
- **Tentative Subdivision Map** – A map intended to divide the property and provide a means of offering roadways and other areas for dedication to the City.

2.0 EXECUTIVE SUMMARY

This section provides an overview of the project and the environmental analysis. For additional detail regarding specific issues, please consult the appropriate chapter of Sections 4.1 through 4.13 (Environmental Setting, Impacts, and Mitigation Measures) of this DEIR.

2.1 PURPOSE AND SCOPE OF THE ENVIRONMENTAL IMPACT REPORT

This DEIR provides an analysis of the potential environmental effects associated with the approval of the Mountain Gate at Shasta Area Plan project located in the City of Shasta Lake. The project proposes an Area Plan that could eventually lead to the creation of approximately 1,604 dwelling units and up to 195,584 square feet of nonresidential development on approximately 590 acres.

The DEIR analysis focuses on potential impacts arising from development of the proposed project. The DEIR adopts this approach in order to provide a credible and conservative scenario of the impacts resulting from project implementation. Where appropriate, some impacts are analyzed under future conditions, which assume buildout of reasonably foreseeable projects in the area. Other issues that are site-specific in nature are evaluated against baseline conditions.

2.2 PROJECT CHARACTERISTICS

The City of Shasta Lake has received applications for a project that consists of the following elements: (1) General Plan Amendment, (2) rezone of the entire project site, (3) approval of a Tentative Subdivision Map, (4) Area Plan adoption, and (5) Development Agreement. A detailed project description is included in Section 3.0 of this DEIR.

Existing roadway access to the site is from Wonderland Boulevard, which dead-ends at the property gate on the east side of the property adjacent to Interstate 5 (I-5). Access to the project site would be from the Mountain Gate interchange with I-5 at the north end of the project site and via a planned roadway extension of Wonderland Boulevard to Cascade Boulevard at the south end of the site. Emergency and pedestrian access would be provided via gated access to Black Canyon Road (see **Figure 3.0-2**).

An internal circulation system, in the form of roads and trails, would link all of the uses in the Area Plan. The system has been designed to encourage walking, biking, and other non-motorized uses. The trails would be located along biologically important areas, such as drainages and wetlands, as well as at the base of slopes. The proposed trails would be separated from roadways in some areas of the project site and adjacent to roadways in others. The Area Plan contains a schematic trail plan, a typical trail design section, and policies that require trail linkages for all land uses. Policies in the Area Plan require that subsequent development connect to and extend any existing trail system. All roads would be built in compliance with City of Shasta Lake standards.

2.3 PROJECT ALTERNATIVES SUMMARY

Alternatives to the proposed project have been analyzed in this DEIR pursuant to CEQA Guidelines Section 15126.6 as detailed in Section 5.0 of this DEIR.

The alternatives analysis provides a comparable analysis between the project and selected alternatives, which include:

Alternative 1 – No Project. CEQA Guidelines Section 15126.6(e)(3) requires a discussion of the “no project” alternative, which would usually proceed along one of two lines.

2.0 EXECUTIVE SUMMARY

When the project is the revision of an existing land use or regulatory plan policy or ongoing operation, the no project alternative will be the continuation of the existing plan, policy, or operation in the future.

If the project is other than a land use or regulatory plan, the no project alternative is the circumstance under which the project does not proceed.

Under the no project alternative, development of the project site would not occur as proposed in the Area Plan. Because the City of Shasta Lake General Plan requires an Area Plan for development, another Area Plan would be required before development could occur. As with the proposed project, any Area Plan for the property would require its own environmental analysis. Approximately 118 acres of the site are designated Urban Residential and Suburban Residential which could develop without an Area Plan. Potential buildout of the areas currently designated for development is discussed in Alternatives Eliminated from Further Consideration in Section 5.0, Alternatives, of this EIR.

Alternative 2 – Black Canyon Road Connection. During the NOP comment period and scoping meeting, several residents along Black Canyon Road expressed concern about connection of the project to this roadway. They were concerned about traffic and noise on a roadway that is in poor condition. The proposed project would allow only pedestrian and emergency vehicle access and does not consider vehicle access as part of the traffic analysis. From a planning perspective, additional vehicle access would help integrate this project into the existing community. This alternative would also reduce impacts at the newly proposed Cascade Boulevard intersection at the southerly boundary of the site.

Alternative 3 – Reduced Wetland and Oak Tree Impact Alternative. This alternative would reduce the development footprint of the proposed project to avoid the jurisdictional wetlands and reduce impacts to oak trees within the project boundaries. This alternative would not allow residential development in several of the development areas. As the commercial and nonresidential areas of the proposed project are located in areas that would not affect waters of the United States or oak trees, the alternative would allow for the same amount of nonresidential development as the proposed project. Overall, this alternative results in less area available for residential development and results in fewer potential residential units.

Alternatives Considered but Eliminated from Further Consideration. In addition to the alternatives analyzed, buildout of the existing General Plan was considered but rejected because it would not further the City's goals to provide a mix of residential and commercial land use in this area of the City and would result in similar impacts as those of the proposed project. Alternative locations for the proposed project were considered but rejected because there are no suitable sites that the project proponent could reasonably acquire, control, or otherwise have access to which would achieve the project objectives. Including additional commercial land within the project to achieve a jobs/housing balance was rejected because other features are included within the boundaries of the project site to more effectively reduce vehicle miles traveled (VMTs) such as trails, sidewalks, bike lanes, and linkages between residential, commercial, and public uses.

2.4 NOTICE OF PREPARATION – COMMENTS

Concerns raised in response to the Notice of Preparation (NOP) for this project were considered during preparation of the DEIR. A copy of each letter is provided in **Appendix 1.0-2** of this DEIR. Major issues addressed in the project comments are summarized below. The list does not summarize all comments received on the project but is intended to represent commonly received comments.

TRAFFIC

- Traffic - realignment of Wonderland Boulevard
- Transit to serve project population
- Potential jobs/housing balance of the project (increased air quality impacts from car and truck travel)
- Potential impacts to freeway interchanges within the city (including and between Oasis Road and Bonnyview Road)
- Connectivity of roads (Shasta Dam Boulevard and Wonderland Boulevard)
- Accessibility of Black Canyon Road and Shasta Way
- Discuss impacts to Union School Road
- Discuss increased car and truck traffic and required facility modifications
- Parking of vehicles on vacant property during snowstorms

ROADWAY AND FIRE HAZARDS

- Potential lack of number of entrance/exit points for amount of traffic from development (one at northeast end and other at south end of project site) and for emergencies (wildfires, etc.)
- Identify fire and safety road concerns
 - Vegetation clearance from construction
 - Fire and safety code awareness
 - Emergency vehicle access

PUBLIC, PEDESTRIAN, AND BICYCLE FACILITIES

- Pedestrian and bicycle facilities in project area and at the Wonderland/Old Oregon/I-5 interchange
- Plans for additional public facilities in project area

2.0 EXECUTIVE SUMMARY

HYDROLOGY

- Additional impact to surface water (stormwater) runoff to state's highway right-of-way or to Caltrans' highway drainage facilities from construction and project development
- New increase to 100-year storm event discharge into state's highway right-of-way or to Caltrans' highway drainage facilities
- Drainage analysis necessary
- Analysis of Moody Creek necessary

ENVIRONMENTAL HAZARDS

- Analysis of agricultural impacts and identification of soils necessary
- Discuss air quality and greenhouse gas emissions; include emissions quantification and any necessary mitigation
- Analyze how extensions of water and wastewater impact existing natural habitat
- Discuss measures taken to ensure proper observation and recording methods of potentially affected species and habitat

PLANNING

- Address consistency with City's General Plan Housing Element goals, policies, and programs for low-income housing

UTILITIES

- Address underground facilities
- Address wastewater treatment plant capacity and potential upgrades
- Address water supply concerns
- Identify electrical distribution systems

OTHER

- Discuss project impacts to service facilities and service roads and from construction (water, wastewater, grading)
- Analyze direct and indirect impacts to wetlands, groundwater quality, and wildlife habitat and species
- Analyze impacts from urban sprawl and project completion at buildout

ALTERNATIVES TO CONSIDER

- Two alternative extensions connecting Wonderland Boulevard to State Route 151 via Shasta Way or via a connection to Cascade Boulevard

2.5 SUMMARY OF ENVIRONMENTAL IMPACTS

Table 2.0-1 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 timing of compliance varies with the mitigation measure. Generally, there are three different periods during which mitigation measures are applied: prior to ground-disturbing activity, during construction, and prior to occupancy. Occasionally there are ongoing mitigation measures that apply or specific timing that affects the measure (e.g., needing to survey for raptors during a specific period of the year), and these are noted in the text of the mitigation measure. The City of Shasta Lake is responsible for ensuring that all mitigation measures are applied to the project at the appropriate time. Because the project will be built in phases, the City anticipates the need to adjust the timing of mitigation.

The proposed project includes a request for a Tentative Subdivision Map that will allow the creation of large parcels intended for future subdivision. The project also includes an Area Plan that establishes the project density and design criteria. The mitigation measures contained in this DEIR will be applied to all approved aspects of the project pursuant to a mitigation monitoring and reporting program (MMRP). It is anticipated that as the proposed project is occupied, some of the mitigation measures will be fully satisfied. When this occurs, the MMRP for subsequent project phases will include the completion date of specific mitigation measures.

2.0 EXECUTIVE SUMMARY

**TABLE 2.0-1
SUMMARY OF IMPACTS AND MITIGATION MEASURES**

Impact		Level of Significance Without Mitigation	Mitigation Measure	Resulting Level of Significance
Land Use				
Impact 4.1.1	Buildout of the proposed project could physically divide, or provide an isolated portion of, the City of Shasta Lake.	LS	None required	LS
Impact 4.1.2	The proposed project has the potential to conflict with policies in the City General Plan adopted for the purpose of avoiding or mitigating an environmental effect.	LS	None required	LS
Impact 4.1.3	The project could conflict with applicable habitat conservation plan or natural community conservation plan.	NI	None required	NI
Impact 4.1.4	The division of the property could conflict with the General or Area Plan or zoning for the site.	NI	None required	NI
Impact 4.1.5	The project would introduce growth into an area that is currently undeveloped and could encourage growth on lands outside of the City.	LCC	None required	LCC
Population/Housing/Employment				
Impact 4.2.1	Buildout of the proposed project would result in population growth and the generation of employment.	LS	None required	LS
Impact 4.2.2	Development of the Mountain Gate at Shasta Area Plan along with approved and proposed development would result in increased population in the City of Shasta Lake.	LCC	None required	LCC

S – Significant
PS – Potentially Significant

LS – Less Than Significant
LCC – Less Than Cumulatively Considerable

SU – Significant and Unavoidable

NI – No Impact
CC – Cumulatively Considerable

Impact	Level of Significance Without Mitigation	Mitigation Measure	Resulting Level of Significance
Transportation and Circulation			
Impact 4.3.1 Under Near-Term Plus Project conditions, all study area intersections would meet level of service standards with the imposition of mitigation. However, there are six study intersections that are wholly outside the City of Shasta Lake's jurisdiction and the City cannot be certain that mitigation will be made.	S	MM 4.3.1a The following intersection improvements shall be completed prior to occupancy of the 50th housing unit, or earlier if directed by the City of Shasta Lake Fire Marshal: • Shasta Dam Boulevard/Shasta Way (Intersection #5) – Remove the existing median on Shasta Dam Boulevard at Shasta Way/Street. Construct a right turn lane on westbound Shasta Dam Boulevard. Construct two left turn lanes on westbound and eastbound Shasta Dam Boulevard at the intersection of Shasta Way/Street. Signalize the intersection of Shasta Dam Boulevard and Shasta Way/Street. • Shasta Dam Boulevard/Mussel Shoals Avenue (Intersection #13) – Construct a traffic signal. • Shasta Dam Boulevard/Median Avenue (Intersection #6) – Construct a traffic signal. MM 4.3.1b The following intersection improvements shall be completed prior to occupancy of the 400th housing unit, or approximately one-half of the proposed project, or earlier if directed by the City of Shasta Lake Fire Marshal: • Old Oregon Trail/Wonderland Boulevard (Intersection #1) – Construct a roundabout or traffic signal. • Old Oregon Trail/I-5 NB Ramp (Intersection #2) – Construct a roundabout or traffic signal. • Shasta Dam Boulevard/Cascade Boulevard (Intersection #15) – Construct a right turn lane on westbound Shasta Dam Boulevard at Cascade Boulevard. Construct a second left turn lane on eastbound Shasta Dam Boulevard at Cascade Boulevard. Construct a second left turn lane on southbound Cascade Boulevard at Shasta Dam Boulevard.	SU

S – Significant

PS – Potentially Significant

LS – Less Than Significant

LCC – Less Than Cumulatively Considerable

SU – Significant and Unavoidable

NI – No Impact

CC – Cumulatively Considerable

2.0 EXECUTIVE SUMMARY

Impact	Level of Significance Without Mitigation	Mitigation Measure	Resulting Level of Significance
		MM 4.3.1c Shasta Dam Boulevard/I-5 SB Ramp – Convert eastbound through lane to a shared through right turn lane. Widen on-ramp to add a second lane to the on-ramp 1,000 feet long. The proposed project shall pay its proportionate share of the cost of the following improvements: Pine Grove Avenue/Twin View Boulevard (Intersection #21) – Pay fee equal to 14 percent of the cost to relocate the intersection west of its current location. The relocated intersection shall include east- and westbound through, left, and right turn lanes. The intersection shall include north- and southbound through and left turn lanes. Construct a traffic signal. Pine Grove Avenue/I-5 NB Ramps (Intersection #20) – Pay fee equal to 14 percent of the cost of installing a traffic signal and a right turn lane on the northbound off-ramp. Pine Grove Avenue/I-5 SB Ramps (Intersection #19) – Pay fee equal to 9 percent of the cost to install a traffic signal. Pine Grove Avenue/Cascade Boulevard (Intersection #18) – Pay fee equal to 7 percent of the cost to realign the south leg of Cascade Boulevard to align with the existing signalized intersection. The south leg of intersection shall include northbound through, right, and left turn lanes and a southbound through lane. Pine Grove Avenue/Ashby Road (Intersection #17) – Pay a fee equal to 17 percent of the cost to install an all-way stop sign or traffic signal. Pine Grove Avenue/Lake Boulevard (Intersection #16) – Pay a fee equal to 15 percent of the cost to install an all-way stop sign or traffic signal.	

S – Significant

LS – Less Than Significant

SU – Significant and Unavoidable

NI – No Impact

PS – Potentially Significant

LCC – Less Than Cumulatively Considerable

CC – Cumulatively Considerable

Impact	Level of Significance Without Mitigation	Mitigation Measure	Resulting Level of Significance
		• Oasis Road/Twin View Boulevard (Intersection #25) – Pay a fee equal to 4 percent of the cost to relocate the intersection east of its current location. The intersection shall include two left turn lanes on west and eastbound Oasis Road at Twin View Boulevard and a right turn lane on southbound Twin View Boulevard at Oasis Road. • Oasis Road/I-5 NB Ramps (Intersection #24) – Pay a fee equal to 5 percent of the project's proportionate share of the traffic signal and north and eastbound turn lane improvements. • Oasis Road/I-5 SB Ramps (Intersection #23) – Pay a fee equal to 4 percent of the cost to construct a westbound left turn lane and to modify the traffic signal. • Oasis Road/Cascade Boulevard (Intersection #22) – Pay a fee equal to 3 percent of the cost to relocate the intersection west of its current location and construct a traffic signal. Intersection improvements shall include in the west and eastbound directions one left, three through, and one right turn lane; in the northbound direction one left, one right, and one through turn lane; and in the southbound direction two left, one through, and one right turn lane. MM 4.3.1d The extension of Wonderland Boulevard to Cascade Boulevard shall be constructed prior to occupancy of the 50th housing unit, or earlier if directed by the City of Shasta Lake Fire Marshal. Timing/Implementation: Implemented prior to occupancy as noted in the mitigation measure. Fees shall be collected at building permit issuance. Enforcement/Monitoring: City of Shasta Lake Development Services Department	
Impact 4.3.2 Following implementation of the proposed project,	LS	None required	LS

S – Significant

LS – Less Than Significant

SU – Significant and Unavoidable

NI – No Impact

PS – Potentially Significant

LCC – Less Than Cumulatively Considerable

CC – Cumulatively Considerable

City of Shasta Lake

April 2014

Mountain Gate at Shasta Area Plan

Draft Environmental Impact Report

2.0 EXECUTIVE SUMMARY

Impact	Level of Significance Without Mitigation	Mitigation Measure	Resulting Level of Significance
all study area roadway segments would meet level of service standards.			
Impact 4.3.3 Implementation of the proposed project would result in an increase in traffic volumes on vicinity freeways that would operate below LOS thresholds under Near-Term Plus Project conditions. While the imposition of mitigation would reduce this impact, vicinity freeways are wholly outside the City of Shasta Lake's jurisdiction and the City cannot be certain that mitigation will be made.	S	MM 4.3.3 The project applicants/ developer(s) shall contribute a fair share amount for all needed improvements to State facilities as shown in Table 4.3-18 or other facilities as mutually agreed upon by Caltrans and the City of Shasta Lake, or as identified in subsequent traffic studies for impacts both within the City of Shasta Lake and outside the City of Shasta Lake. The fair share contribution shall be determined by the City of Shasta Lake based on the traffic study or subsequent traffic monitoring studies required of the developer. The fair share calculation shall also be determined and verified in consultation with the Shasta County Regional Transportation Planning Agency, which includes Shasta County and the City of Redding. This mechanism will ensure that the collected mitigation funds will be spent on the measures identified in the TIS or on alternative improvements that will reduce the project's impacts to regional transportation. Timing/Implementation: Implemented prior to approval of subsequent tentative maps for residential development, or a site plan for non-residential development. Enforcement/Monitoring: City of Shasta Lake Development Services Department	SU
Impact 4.3.4 Implementation of the proposed project would result in an increase in traffic volumes on vicinity freeway ramp junctions that would operate below LOS thresholds under Near-Term Plus Project conditions. While the imposition of mitigation would reduce this impact, vicinity freeway ramp junctions are wholly outside the City of Shasta Lake's jurisdiction and the City cannot be certain that mitigation will be made.	S	Payment of fair-share contributions as described in mitigation measure MM 4.3.3.	SU
Impact 4.3.5 Implementation of the proposed project would not	LS	None required	LS

S – Significant

LS – Less Than Significant

SU – Significant and Unavoidable

NI – No Impact

PS – Potentially Significant

LCC – Less Than Cumulatively Considerable

CC – Cumulatively Considerable

Impact	Level of Significance Without Mitigation	Mitigation Measure	Resulting Level of Significance
result in increased traffic hazards.			
Impact 4.3.6 The Area Plan designates new streets that would provide connectivity within the Area Plan, creating new routes for all users including emergency response providers.	PS	MM 4.3.6 An all-weather surface roadway connection suitable for emergency vehicle ingress and egress shall be constructed between Cascade Boulevard and Wonderland Boulevard. Timing/Implementation: Implemented prior to occupancy of the 50th housing unit, or earlier if directed by the City of Shasta Lake Fire Marshall. Enforcement/Monitoring: City of Shasta Lake Development Services Department	PS
Impact 4.3.7 The proposed project would not conflict with adopted policies, plans, or programs supporting alternative transportation (e.g., bus turnouts, bicycle racks).	NI	None required	NI
Impact 4.3.8 Under Year 2020 Plus Project conditions, all study area intersections would meet level of service standards with the imposition of mitigation. However, there are six study intersections that are wholly outside the City of Shasta Lake's jurisdiction and the City cannot be certain that mitigation will be made.	CC	Implementation of mitigation measures MM 4.3.1 , MM 4.3.3 , and MM 4.3.5 would improve the level of service at all intersections to acceptable levels under Year 2020 Plus Project conditions. However, some of these intersections are partially or wholly outside the City of Shasta Lake's jurisdiction (see Table 4.3-2 for a listing of intersection by jurisdiction) While the City will require the proposed project to either make the identified improvement or pay the appropriate proportionate share of the cost of improvements, and will hold the fees until requested by the jurisdiction, the City cannot be certain that the other agencies will permit the improvement and therefore must assume that the impacts could remain. As such, impacts to all of the intersections that are outside the City's jurisdiction are classified as cumulatively considerable and significant and unavoidable because the City cannot be certain that improvements will be made consistent with this Draft EIR.	CC & SU
Impact 4.3.9 Following implementation of the proposed project, all study area roadway segments would meet level of service standards under Year 2020 Plus Project conditions.	LCC	None required	LCC
Impact 4.3.10 Implementation of the proposed project would result in an increase in traffic volumes on vicinity freeways	CC	Implementation of mitigation measure MM 4.3.3 , described above, would improve the level of service at all freeway mainline segments to	CC & SU

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2.0 EXECUTIVE SUMMARY

Impact	Level of Significance Without Mitigation	Mitigation Measure	Resulting Level of Significance
that would operate below LOS thresholds under Year 2020 Plus Project conditions. While the imposition of mitigation would reduce this impact, vicinity freeways are wholly outside the City of Shasta Lake's jurisdiction and the City cannot be certain that mitigation will be made.		acceptable levels under Cumulative Year 2020 Plus Project conditions. However, I-5 is wholly outside the City of Shasta Lake's jurisdiction which does not have the ability to construct improvements on I-5 or on any facility within Caltrans jurisdiction. Therefore, this EIR assumes that the improvements will not be constructed and that the impacts will remain significant and unavoidable. The City is, nonetheless, requiring that the project contribute toward freeway mainline improvements. The City, however, cannot be certain that improvements will be made consistent with this EIR.	
Impact 4.3.11 Implementation of the proposed project would result in an increase in traffic volumes on vicinity freeway ramp junctions under Year 2020 Plus Project conditions that would exacerbate an unacceptable level of service. While the imposition of mitigation would reduce this impact, vicinity freeway ramp junctions are wholly outside the City of Shasta Lake's jurisdiction, and the City cannot be certain that mitigation will be made.	CC	Payment of fair share contributions as described in MM 4.3.3 .	CC & SU
Impact 4.3.12 Implementation of the Wonderland Boulevard southern access extension conceptualized under the project would result in an exceedence of LOS thresholds under Year 2020 Plus Project conditions.	CC	Implementation of mitigation measures MM 4.3.1a through MM 4.3.1d and MM 4.3.3 , described previously, would ensure that intersection improvements were installed at various stages of project development. Construction of the intersections would result in impacts that are less than significant however some of the improvements are not within the City's jurisdiction. As these improvements are not wholly within the ability of the City to implement this EIR assumes that the improvements might not occur.	CC & SU
Impact 4.3.13 Under Year 2030 Plus Project conditions, all study area intersections would meet level of service standards with the imposition of mitigation. However, there are six study intersections that are wholly outside the City of Shasta Lake's jurisdiction and the City cannot be certain that mitigation will be made.	CC	Mitigation measures MM 4.3.1a through MM 4.3.1c and MM 4.3.3 would improve the level of service at the Mountain Gate Road/I-5 interchange; however, this facility is outside the City of Shasta Lake's jurisdiction. As such, impacts to all of the intersections that are outside the City's jurisdiction are classified as cumulatively considerable and significant and unavoidable because the City cannot be certain that improvements will be made consistent with this Draft EIR. (The intersections at Lake Boulevard/Pine Grove Avenue, Pine Grove Avenue/Cascade Boulevard,	CC & SU

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Impact	Level of Significance Without Mitigation	Mitigation Measure	Resulting Level of Significance
		Pine Grove Avenue/Twin View Boulevard, Oasis Road/Cascade Boulevard, and Cypress Avenue/Hilltop Drive are within the City's jurisdiction; therefore, impacts to those intersections can be mitigated.)	
Impact 4.3.14 Following implementation of the proposed project, all study area roadway segments would meet level of service standards under Year 2030 Plus Project conditions.	PCC	MM 4.3.14 The following improvements shall be implemented for Year 2030 Plus Project conditions: Widening of the roadway segment from Pine Grove Avenue to the west of Cascade Boulevard to four-lane arterial standards. Timing/Implementation: Implemented prior to and during construction Enforcement/Monitoring: City of Shasta Lake Development Services Department	LCC
Impact 4.3.15 Implementation of the proposed project would result in an increase in traffic volumes on vicinity freeways that would operate below LOS thresholds under Year 2030 Plus Project conditions. While the imposition of mitigation would reduce this impact, vicinity freeways are wholly outside the City of Shasta Lake's jurisdiction and the City cannot be certain that mitigation will be made.	CC	Implementation of mitigation measures MM 4.3.1a through MM 4.3.1c and MM 4.3.3 , described above, would improve the level of service at all freeway mainline segments to acceptable levels under Cumulative Year 2020 Plus Project conditions. However, Interstate 5 is wholly outside the jurisdiction of the City of Shasta Lake, which does not have the ability to construct improvements on I-5 or on any facility within Caltrans' jurisdiction. The Draft EIR must assume that the improvements are not constructed and the impacts remain significant and unavoidable. This has the unfortunate result of appearing that the impacts of the project are being ignored by the City of Shasta Lake, which is not the case. The City is requiring that the project contribute toward freeway mainline improvements. Yet because I-5 is wholly outside the City of Shasta Lake's jurisdiction, the City cannot be certain that improvements will be made consistent with this Draft EIR. If the improvement cannot be constructed, the impact is not fully mitigated, and the agency can only conclude that the impact is cumulatively considerable and significant and unavoidable .	CC & SU
Impact 4.3.16 Implementation of the proposed project would result in an increase in traffic volumes on vicinity freeway ramp junctions under Year 2030 Plus Project conditions that would exacerbate unacceptable LOS. While the imposition of mitigation would reduce this impact, vicinity freeway ramp junctions are wholly	CC	Payment of fair-share contributions as described in mitigation measure MM 4.3.3 .	CC & SU

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2.0 EXECUTIVE SUMMARY

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outside the City of Shasta Lake's jurisdiction and the City cannot be certain that mitigation will be made.			
Impact 4.3.17 Implementation of the Wonderland Boulevard southern access extension conceptualized under the project would result in an exceedence of LOS thresholds under Year 2030 Plus Project conditions.	CC	Mitigation measures MM 4.3.1a through MM 4.3.1d and MM 4.3.3 , described above, would improve the level of service at all intersections to acceptable levels under Year 2030 Plus Project conditions. However, two of the intersections are wholly outside the City of Shasta Lake's jurisdiction (SR 151 Shasta Street and SR 151/I-5 Southbound Ramps). As such, impacts to these intersections are classified as cumulatively considerable and significant and unavoidable because the City cannot be certain that improvements will be made consistent with this Draft EIR.	CC & SU
Air Quality			
Impact 4.4.1 Subsequent land use activities associated with implementation of the proposed Area Plan would potentially conflict with the City General Plan and/or obstruct implementation of the Northern Sacramento Valley Planning Area 2009 Air Quality Attainment Plan.	PS	MM 4.4.1 All development projects located within the Mountain Gate at Shasta Area Plan shall adhere to all applicable SCAQMD rules and regulations during both construction and operation. Timing/Implementation: Ongoing Enforcement/Monitoring: City of Shasta Lake Development Services Department; Shasta County Air Quality Management District	LS
Impact 4.4.2 Construction activities such as clearing, excavation and grading operations, construction vehicle traffic, and wind blowing over exposed earth would generate exhaust emissions and fugitive particulate matter emissions that would temporarily affect local air quality for adjacent land uses.	S	MM 4.4.2 Applicants of development projects located within the Mountain Gate at Shasta Area Plan shall submit to the City of Shasta Lake and receive approval for an Emissions Reduction Plan for all subsequent development projects under the Area Plan. City approval will be determined on a project-by-project basis in coordination with the Shasta County Air Quality Management District. The Emissions Reduction Plan shall include all measures recommended by the SCAQMD for the control of fugitive and mobile-source emissions associated with on-site construction activities. Timing/Implementation: Prior to approval of subsequent tentative subdivision maps or other discretionary approvals Enforcement/Monitoring: City of Shasta Lake Development Services	SU

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**Mountain Gate at Shasta Area Plan
Draft Environmental Impact Report**

**City of Shasta Lake
April 2014**

Impact	Level of Significance Without Mitigation	Mitigation Measure	Resulting Level of Significance
		<i>Department; Shasta County Air Quality Management District</i>	
Impact 4.4.3 Project-generated operational emissions would exceed applicable significance thresholds and could contribute to regional non-attainment conditions.	PS	MM 4.4.3a The installation of wood-burning fireplaces shall be prohibited in all new residential units of subsequent development projects within the Mountain Gate at Shasta Area Plan. Timing/Implementation: <i>Verified prior to issuance of building permits</i> Enforcement/Monitoring: <i>City of Shasta Lake Development Services Department</i> MM 4.4.3b Applicants for subsequent project level development approvals within the Mountain Gate at Shasta Area Plan shall submit to the Shasta County AQMD and receive approval for an Emissions Reduction Plan (ERP). Available Mitigation Measures currently recommended by the Shasta County AQMD are summarized in Table 4.4-7. Timing/Implementation: <i>Prior to approval of subsequent tentative subdivision maps or other discretionary approvals</i> Enforcement/Monitoring: <i>City of Shasta Lake Development Services Department; Shasta County Air Quality Management District</i>	SU
Impact 4.4.4 Implementation of the project would not contribute to localized concentrations of mobile-source CO that would exceed applicable ambient air quality standards.	LS	None required	LS
Impact 4.4.5 Implementation of the project would not result in increased exposure of existing or planned sensitive land uses to stationary or mobile-source TACs that would exceed applicable standards.	LS	None required	LS
Impact 4.4.6 Long-term operation of the project would result in increased emissions of ozone-precursor pollutants and PM ₁₀ that would exceed applicable significance thresholds and could contribute to future concentrations of ozone and PM ₁₀ , for which the region is currently designated non-attainment.	CS & SU	Implement mitigation measures MM 4.4.1 , MM 4.4.2 , and MM 4.4.3 .	CS & SU

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Impact	Level of Significance Without Mitigation	Mitigation Measure	Resulting Level of Significance
Impact 4.4.7 Implementation of the proposed project, in combination with existing, approved, proposed, and reasonably foreseeable development in the North Sacramento Valley Air Basin, would not contribute to localized concentrations of mobile-source CO or TACs that would exceed applicable ambient air quality standards. This impact would be considered less than cumulatively considerable .	LCC	None required	LCC
Noise			
Impact 4.5.1 Short-term construction-generated noise levels could result in a substantial increase in ambient noise levels at nearby noise-sensitive land uses, including proposed residential uses that are constructed and inhabited before other portions of the project are complete.	PS	MM 4.5.1 The City shall establish the following as conditions of approval for any permit that results in the use of construction equipment: - Construction activities (excluding activities that would result in a safety concern to the public or construction workers) shall be limited to between the daytime hours of 7 AM and 7 PM, Monday through Saturday. Construction activities shall be prohibited on Sundays and federal/state-recognized holidays. - Construction equipment shall be properly maintained and equipped with noise-reduction intake and exhaust mufflers and engine shrouds, in accordance with manufacturers' recommendations. Equipment engine shrouds shall be closed during equipment operation. - When not in use, motorized construction equipment shall not be left idling for more than 5 minutes. - Stationary equipment (power generators, compressors, etc.) shall be located at the furthest practical distance from nearby noise-sensitive land uses or sufficiently shielded to reduce noise-related impacts.	LS

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Impact	Level of Significance Without Mitigation	Mitigation Measure	Resulting Level of Significance
		Timing/Implementation: Implemented prior to approval of grading and/or building permits Enforcement/Monitoring: City of Shasta Lake Development Services Department	
Impact 4.5.2 Implementation of the proposed project would not result in substantial increases in near-term traffic noise levels along area roadways.	LS	None required	LS
Impact 4.5.3 Exposure to noise levels generated by future stationary sources associated with the proposed commercial land uses could result in a substantial increase in ambient noise levels that could exceed the City's noise standards at noise-sensitive land uses.	PS	MM 4.5.3a The following mitigation measures shall be applied to all residential development within the Area Plan: - Residential dwellings shall be equipped with central heating and air conditioning systems to allow closure of windows during inclement weather conditions. - Exterior air conditioning units located within 10 feet of adjacent residential dwellings shall be low-noise-rated and shielded from direct line of sight to adjacent residential dwellings. Shielding may include, but is not limited to, the use of wood fencing, provided no visible air gaps are detectable between individual panels. Use of tongue-and-groove or overlapping panels is recommended. - The Development Services Director or his/her designee may allow alternative design based on the recommendations of an acoustical consultant. Timing/Implementation: Verified prior to issuance of a building permit Enforcement/Monitoring: City of Shasta Lake Development Services Department MM 4.5.3b The following mitigation measures shall be applied to all commercial development within the Area Plan: - The City shall require an acoustical assessment to be performed prior to construction of the proposed commercial land uses. Where acoustical analysis determines that stationary source noise levels would	LS

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2.0 EXECUTIVE SUMMARY

Impact	Level of Significance Without Mitigation	Mitigation Measure	Resulting Level of Significance
		exceed applicable noise standards as set forth in this Draft EIR, the City shall require the implementation of noise attenuation measures sufficient to achieve compliance with applicable noise standards at nearby noise-sensitive land uses. Such measures may include, but are not limited to, the incorporation of setbacks, sound barriers, berms, or equipment enclosures. Timing/Implementation: Prior to issuance of building permit Enforcement/Monitoring: City of Shasta Lake Development Services Department	
Impact 4.5.4 Projected onsite transportation noise levels at nearby proposed onsite development would exceed the City's noise-sensitivity standards for land use compatibility.	PS	MM 4.5.4 Applicants for subsequent project level development approvals within the Mountain Gate at Shasta Area Plan shall be required to prepare an acoustical assessment evaluating on-site noise levels at proposed residential dwellings. The assessment shall address residential land uses located within 855 feet of the UPRR centerline, residential land uses located within 819 feet of the I-5 centerline, commercial land uses located within 382 feet of the I-5 centerline, and residential dwellings located along proposed on-site major roadways (i.e., 5,000 ADT or greater). Mitigation measures shall be identified to reduce predicted transportation noise levels at on-site receptors to below the City's acceptable exterior and interior noise sensitivity standards. Mitigation measures commonly applied to reduce transportation noise levels may include, but are not limited to, the following: • Construction of sound barriers to shield on-site land uses from line of sight of the noise source. • Orientation of on-site structures to shield more noise-sensitive land uses from line of sight of the noise source or use of open-space areas to provide increased setback distances to noise-sensitive land uses.	LS

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		Incorporation of increased insulation and noise-reduction features (e.g., sound-rated windows and doors) in building design and construction. Timing/Implementation: Prior to approval of subsequent tentative subdivision maps or other discretionary permits and/or issuance of grading or building permits as applicable. Enforcement/Monitoring: City of Shasta Lake Development Services Department	
Impact 4.5.5 Short-term construction and long-term operation of the proposed land uses would not exceed commonly applied thresholds for the prevention of structural damage or human annoyance.	LS	None required	LS
Impact 4.5.6 Implementation of the proposed project would not result in a substantial contribution to future cumulative traffic noise levels.	LCC	None required	LCC
Biological Resources			
Impact 4.6.1 Development of the proposed project could result in adverse impacts to nesting special-status birds, raptors, and migratory birds.	PS	MM 4.6.1a To the extent practicable, removal of vegetation, grading, and other construction activities shall be initiated outside of the nesting season (i.e. initiated from October through February). Timing/Implementation: Prior to initiating construction of each subsequent development allowed under the Area Plan Enforcement/Monitoring: City of Shasta Lake Development Services Department MM 4.6.1b In areas where suitable raptor nesting habitat (e.g. large trees) will be removed during the nesting season (approximately September through February) or where construction activities will occur within 500 feet of suitable raptor nesting habitat or within 660 feet of suitable bald eagle nesting habitat during the nesting season, a qualified biologist shall conduct pre-construction surveys for nesting raptors and bald eagles.	LS

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		At least one survey shall be conducted no more than two weeks prior to the anticipated onset of construction activity at each phase of development and all surveys shall cover a minimum of a 660 foot buffer around the proposed construction zones. If vegetation removal or other construction activities are delayed or suspended for more than two weeks after the pre-construction survey, the site shall be resurveyed. If no active raptor or bald eagle nests are identified, no further measures are necessary. If active raptor nests are identified within the 500 foot buffer, or active bald eagle nests are identified within the 660 buffer, the following measures shall be implemented: 1. If feasible, avoid construction activities within 500 feet of active raptor nests and 660 feet of active bald eagle nests until nesting activity has ceased, as determined by a qualified biologist. 2. If avoidance of all construction activities within 500 feet of active raptor nests and/or 660 feet of active bald eagle nests is not feasible, a qualified biologist, in consultation with the CDWF, shall identify measures necessary to avoid "take" of active nests. These measures shall include, but are not limited to, maintaining a minimum distance from active nesting sites and monitoring by a qualified biologist. The monitoring biologist shall have authority to stop any work determined to be adversely affecting nesting activity. The monitoring biologist shall report any "take" of active raptor nests to the CDWF. Timing/Implementation: Prior to issuance of a grading permit for each subsequent development allowed under the Area Plan Enforcement/Monitoring: City of Shasta Lake Development Services Department	

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Impact	Level of Significance Without Mitigation	Mitigation Measure	Resulting Level of Significance
		MM 4.6.1c In areas where suitable nesting habitat for migratory birds, such as purple martins, will be removed during the nesting season (approximately March to September), a qualified biologist shall conduct pre-construction surveys for active nest sites. At least one survey shall be conducted no more than two weeks prior to the anticipated onset of construction activity. Surveys shall cover all areas where suitable nesting habitat will be removed, as well as the surrounding 250 foot buffer area. If vegetation removal activities are delayed or suspended for more than two weeks after the pre-construction survey, the site shall be resurveyed. If no active nests are identified, no further measures are necessary. If an active nest is found during the pre-construction survey, a 250 foot buffer shall be established around the nesting site to avoid inadvertent disturbance of the nest and potential abandonment. The nesting site and buffer shall remain undisturbed until after the young have fledged. The width of the buffer should be determined by the biologist in coordination with CDFW and would be dependent on the types of activities planned with the vicinity of the nest. Timing/Implementation: Prior to issuance of a grading permit for each subsequent development allowed under the Area Plan Enforcement/Monitoring: City of Shasta Lake Development Services Department	
Impact 4.6.2 Direct disturbance (e.g. removal, trimming) to elderberry shrubs or activities within 100 feet of the elderberry shrubs could result in adverse impacts to valley elderberry longhorn beetle (VELB), if this species is present.	PS	MM 4.6.2a Prior to any ground disturbing activities, pre-construction surveys for elderberry shrubs shall be conducted by a qualified biologist. If no elderberry shrubs are located, no further measures are necessary. Timing/Implementation: Prior to issuance of a grading permit for each subsequent development allowed under the Area Plan Enforcement/Monitoring: City of Shasta Lake Development Services Department	LS

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		MM 4.6.2b If practicable, avoid construction activities within 100 feet of any identified elderberry shrubs and provide fencing or signage as necessary to keep people and equipment outside of the 100-foot buffer throughout construction. Provide for the preservation of the elderberry shrubs and maintenance of the 100-foot buffer throughout the life of the project. Timing/Implementation: Prior to issuance of a grading permit for each subsequent development within 100 feet of elderberry shrubs Enforcement/Monitoring: City of Shasta Lake Development Services Department MM 4.6.2c If avoidance of the elderberry shrubs and 100-foot buffer is not practicable, a USFWS protocol-level survey for valley elderberry longhorn beetles shall be conducted by a qualified biologist. If no evidence of the presence of the species is detected during the survey, and in the professional opinion of the biologist, valley elderberry longhorn beetles are not likely to occur within the proposed project site, the USFWS shall be contacted with a request for concurrence with a “no effect” or “not likely to adversely effect” determination. If the USFWS concurs that the project will not affect valley elderberry longhorn beetles, no further measures are required. If evidence of the species is detected during the protocol-level survey or the USFWS will not concur with a “no effect” or “not likely to adversely effect” determination: 1. Formal consultation with the USFWS shall be initiated under Section 7 or Section 10 of the Endangered Species Act, as appropriate. No activities shall occur within 100 feet of the elderberry shrubs until Incidental Take authorization has been obtained from the USFWS. Timing/Implementation: Prior to issuance of a grading permit for each subsequent development within 100 feet of elderberry shrubs	

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		<i>Enforcement/Monitoring: City of Shasta Lake Development Services Department</i>	
Impact 4.6.3 Development of the proposed project could result in impacts to waters of the U.S., including wetland habitats.	PS	MM 4.6.3a Prior to initiating construction within 100 feet of “waters of the U.S.”, including wetlands, the preliminary wetland delineation report shall be submitted to and verified by the USACE. <i>Timing/Implementation: Prior to issuance of a grading permit</i> <i>Enforcement/Monitoring: City of Shasta Lake Development Services Department</i> MM 4.6.3b Authorization under a Nationwide Permit or Individual Permit shall be obtained from the USACE. For fill requiring a USACE permit, water quality certification shall be obtained from the RWQCB prior to discharge of dredged or fill material. All mitigation required by USACE shall be satisfied, including any replacement requirement at a ratio intended to fulfill the no net loss policy. Prior to any activities that would obstruct the flow of, or alter the bed, channel, or bank of any intermittent or ephemeral creeks, notification of streambed alteration shall be submitted to the CDFW; and, if required, a streambed alteration agreement shall be obtained <i>Timing/Implementation: Prior to issuance of a grading permit</i> <i>Enforcement/Monitoring: City of Shasta Lake Development Services Department</i>	LS
Impact 4.6.4 Development of the proposed project would result in the reduction of oak woodland habitat and loss of annual grassland.	S	MM 4.6.4 Three fifteen (15) gallon trees shall be planted for each protected tree removed that exceeds ten inches DBH, in compliance with the City’s Tree Preservation Ordinance. <i>Timing/Implementation: Prior to final completion of the large lot circulation plan improvements.</i> <i>Enforcement/Monitoring: City of Shasta Lake Development Services Department</i>	LS

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Impact 4.6.5 Development of the proposed project would result in the loss of breeding and foraging habitat for common and special-status wildlife species; and may result in indirect impacts to these species.	PS	MM 4.6.5 Streetlights shall be shielded and directed downward to the street, away from open space areas to the extent practicable. Implementation of mitigation measure MM 4.12.3 for additional mitigation to reduce nighttime lighting impacts has been included. <i>Timing/Implementation: Prior to improvement plan approval</i> <i>Enforcement/Monitoring: City of Shasta Lake Development Services Department</i>	LS
Impact 4.6.6 Construction associated with the proposed Mountain Gate at Shasta Area Plan could block or disrupt a major wildlife migration or a travel corridor.	LS	None required	LS
Impact 4.6.7 Development of the proposed project could conflict with the City of Shasta Lake tree conservation policies and ordinances.	LS	Implementation of mitigation measure MM 4.6.4 would reduce this impact to a less than cumulatively considerable level.	LCC
Impact 4.6.8 Buildout of the proposed project may affect wetland resources.	PCC	Implementation of mitigation measures MM 4.6.1a through MM 4.6.3 would reduce this impact to a less than cumulatively considerable level.	LCC
Impact 4.6.9 Buildout of the proposed project will result in the loss of oak woodland habitat.	PCC	MM 4.6.9 In addition to the minimum planting standards in the City's Tree Conservation Ordinance, future development shall be required to comply with the requirements in the Area Plan, which include the following tree replacement planting and preservation requirements: • All future roadways within parcels A-U shall incorporate street trees and a setback sidewalk design. Street trees shall be planted 30' on-center (O.C.) where feasible within the landscaped parkways taking into account necessary setbacks from fire hydrants, intersections, driveways, etc. • All protected trees shall remain within parcels B, T & U (open space) except where those trees interfere with utility extensions or other improvements required as part of the Mountain Gate development. • Protected trees shall remain within parcels C & K	CC & SU

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		(park areas) and additional 15-gallon trees shall be planted as part of the park improvements. • Single family parcels within Parcel F, Q & S (very low density residential) shall have two additional 15-gallon trees planted per parcel in addition to the required three 15-gallon oak trees to be planted for each proposed single-family unit/lot and any required replacement trees. • Pavement and base shall be removed from the southern terminus of the existing Wonderland Boulevard (south of proposed parcel A); a tree mitigation planting area shall be created and vegetated with small rooted stock. • 15-gallon trees approximately 50' O.C., shall be planted adjacent to the pedestrian trails (in non-forested areas) within the open space corridors. Timing/Implementation: Prior to improvement plan approval or occupancy of any residential or commercial use as applicable. Enforcement/Monitoring: City of Shasta Lake Development Services Department	
Impact 4.6.10 Buildout of the proposed project would result in the loss of heritage oak trees.	PCC	MM 4.6.10 The following measures shall apply to construction in the vicinity of heritage oak trees: 1. Fencing shall be provided at least 6 feet outside of the dripline of all trees to be preserved. The fencing is to remain during construction. 2. No construction activities, including vehicle parking or materials stockpiling, shall occur within the fenced area. 3. No grading, cutting, or trenching shall occur within the protected area. 4. Any pruning of the tree for safety or tree health shall only be done under the supervision of a City-approved arborist.	LCC

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		5. Irrigation systems proposed adjacent to the trees shall be reviewed and approved by a City-approved arborist. 6. Prior to occupancy of any home or business adjacent to a heritage tree, tree maintenance information shall be provided to the City for review and comment. The maintenance information shall inform the homeowner or business owner of the importance of how to ensure the longevity of the tree. The information shall be reviewed by a City-approved arborist. Timing/Implementation: Prior to and during construction and prior to occupancy of any residential or commercial use as applicable. Enforcement/Monitoring: City of Shasta Lake Development Services Department	
Hydrology and Water Quality			
Impact 4.7.1 Soil and slope disturbance associated with construction activities for the proposed project could cause accelerated soil erosion and sedimentation or the release of other construction-related pollutants into adjacent waterways.	LS	None required	LS
Impact 4.7.2 Development and operation of the proposed project could increase surface runoff, which may contain contaminants that could enter surface waters and possibly groundwater.	PS	MM 4.7.2a Water Quality Control Plan: The project applicant shall submit a water quality control plan for operation of the project site. Permanent water quality features will be incorporated into project development plans and will include best management practices (BMPs) to minimize and control pollutants in stormwater runoff. Water quality control measures identified in the water quality control plan can include, but are not limited to, the following: • Sediment will be retained on-site by a system of sediment basins, traps, or other appropriate measures. • Description of measure to reduce "first flush"	LS

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Impact	Level of Significance Without Mitigation	Mitigation Measure	Resulting Level of Significance
		contaminants after construction, as well as plans for maintenance, funding, and scheduling for servicing the drainage system. Timing/Implementation: Prior to approval of subsequent tentative subdivision maps or other discretionary permits, and/or issuance of grading permits Enforcement/Monitoring: City of Shasta Lake Public Works Department and Central Valley Regional Water Quality Control Board. MM 4.7.2b The development plans of future development under the proposed project shall contain specific structural and non-structural post-construction BMPs, such as grassed swales, bioretention, porous pavement, treatment vaults, retention of buffer strips, minimization of impervious surfaces, and approximate locations of each BMP. Timing/Implementation: Prior to approval of subsequent tentative subdivision maps or other discretionary permits, and/or issuance of grading permits Enforcement/Monitoring: City of Shasta Lake Public Works Department and Central Valley Regional Water Quality Control Board. MM 4.7.2c The overall design and development of the Mountain Gate at Shasta Area Plan shall include post-construction stormwater BMPs to mitigate for stormwater discharges associated with the post-development of the site. The BMPs shall be incorporated into the project, as described in the application package, to treat stormwater runoff from the site. Timing/Implementation: Prior to approval of subsequent tentative subdivision maps or other discretionary permits, and/or issuance of grading permits Enforcement/Monitoring: City of Shasta Lake Public Works Department and Central Valley Regional Water Quality Control Board. MM 4.7.2d Prior to approval of a final subdivision or parcel map, the project applicant shall develop a landscaping plan to	

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2.0 EXECUTIVE SUMMARY

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		include provisions for the use of slow release fertilizers for common landscape areas. The landscape plans shall be submitted to the City of Shasta Lake Development Services Department for review and approval. Timing/Implementation: Prior to approval of subsequent tentative subdivision maps or other discretionary permits, and/or issuance of grading permits Enforcement/Monitoring: City of Shasta Lake Development Services Department and Central Valley Regional Water Quality Control Board. MM 4.7.2e As part of the submittal of improvement plans for each phase of the project, the project applicant shall submit and obtain approval of a final drainage plan. The plan shall be prepared by a registered civil engineer and shall, at a minimum, include the following: • A written text addressing existing conditions, the effects of project improvements, all appropriate calculations, a watershed map, changes in downstream flows and flood elevations, proposed on- and off-site improvements, features to protect downstream uses and property, and if any drainage easements are needed to accommodate downstream flows from the project. Project drainage features shall be designed to ensure that no change in downstream flow conditions would result in new or increased severity of flooding for each phase of development. • The drainage details shall address storm drainage management during construction and thereafter and shall propose best management practice measures to reduce erosion, water quality degradation, etc. Permanent water quality control features shall demonstrate that the water quality controls would ensure that stormwater discharges would not result in pollutant levels or concentrations that would have a detrimental effect to aquatic life in	

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		ephemeral or intermittent creek drainages. Stormwater discharges shall be in compliance with all current requirements of the Central Valley Regional Water Quality Control Board. - Storm drainage from on-site impervious surfaces shall be collected and treated to protect existing water quality. The maintenance of facilities shall be the responsibility of the project applicant. When the community is under control of a homeowners association, it is the association's obligation to provide facility maintenance. Where facilities are the responsibility of the City, easements for access to and maintenance of these facilities shall be created and offered for dedication to the City. When the facilities are located on property owned by a homeowners association, it shall be the association's obligation to provide facility maintenance. - Conformance with applicable City of Shasta Lake drainage requirements shall be demonstrated. - All related underground and surface drainage systems must be addressed in order to ensure full integration of areas that would generate runoff. These areas would include rooftops, sidewalks, cut/fill slopes, patio areas, streets, parking lots, up-gradient off-site source areas, and impervious landscaping areas. Seepage from underground sources must also be addressed. - The report shall show that post-project flows would not exceed pre-project flows and the associated drainage improvements required to meet these standards. Timing/Implementation: Prior to approval of subsequent tentative subdivision maps or other discretionary permits, and/or issuance of grading permits and included in a final drainage report.	

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		Enforcement/Monitoring: City of Shasta Lake Public Works Department.	
Impact 4.7.3 The proposed project could potentially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volumes or a lowering of the local groundwater table level.	LS	None required	LS
Impact 4.7.4 The proposed project could substantially alter the existing drainage pattern of the site or area, or could increase the amount of surface water, in a manner which could result in flooding on- or off-site.	PS	MM 4.7.4 The final site drainage plan shall include detention ponds designed to store and attenuate stormwater runoff as shown in Figure 4.7-2. Each of the detention ponds will have restricted outlets that will “calm” the velocity of runoff rates of storm events on the upstream side of the restricted outlets and provide for settlement of sediments. Also, the final site drainage plan shall include adequate provisions for erosion control at points of discharge for runoff generated within development areas. Timing/Implementation: Prior to approval of grading permits and/or improvement plans Enforcement/Monitoring: City of Shasta Lake Public Works Department	LS
Impact 4.7.5 Implementation of the project at buildout would increase the amount of impervious surfaces and increase drainage rates and runoff over existing conditions.	PS	Implement mitigation measures MM 4.7.2e and MM 4.7.4. MM 4.7.5 The project applicant shall provide to the City a final set of proposed improvement plans and calculations accepted by the City including but not limited to the following: Quantification of anticipated runoff rates during appropriate design storms. A comprehensive storm drain system design, including inlets, outlets, conveyance systems, and detention systems. Appropriate pipe sizing to accommodate design storm flows and sizing of stormwater detention facilities. Identification of pipe sizing, pipe location, and the location of the inlet and outlet structures.	LS

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Impact	Level of Significance Without Mitigation	Mitigation Measure	Resulting Level of Significance
		Timing/Implementation: Prior to approval of a grading permit and/or improvement plans Enforcement/Monitoring: City of Shasta Lake Development Services Department; City of Shasta Lake Department of Public Works; Central Valley Regional Water Quality Control Board	
Impact 4.7.6 Development of the proposed project will not place housing or other types of structures within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map.	LS	None required	LS
Impact 4.7.7 The proposed project is not expected to expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam, nor will the project expose people or structures to a hazard of inundation by seiche, tsunami, or mudflow.	LS	None required	LS
Impact 4.7.8 The proposed project in combination with planned and proposed development in the City of Shasta Lake would alter drainage conditions and rates, which could result in potential flooding impacts.	LCC	Implementation of mitigation measures MM 4.7.2e, MM 4.7.4, and MM 4.7.5 would ensure that the project's contribution to increases to drainage and flooding would not result in new or increased severity of flooding, which would ensure that this impact is less than cumulatively considerable.	LCC
Impact 4.7.9 The proposed project in combination with planned and proposed development in the City of Shasta Lake would contribute to potential impacts to surface and groundwater quality from construction and operation activities.	LCC	Implementation of mitigation measures MM 4.7.2a through 4.7.2e .	LCC
Geology and Soils			
Impact 4.8.1 Buildout of the project would require extensive grading and site preparation, which may increase soil erosion and affect slope stability.	PS	MM 4.8.1a The developer shall submit a final grading plan and an Erosion and Sediment Control Plan, prepared by a licensed engineer, to the City of Shasta Lake, pursuant to the specifications of the Grading, Erosion Control, and Hillside Development Ordinance (Chapter 15.08 in the	PS

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		City of Shasta Lake Municipal Code). The plan shall incorporate measures for erosion control as recommended in future geotechnical studies completed to assess design and construction of future project elements. Timing/Implementation: Prior to approval of subsequent tentative subdivision maps or other discretionary permits, and/or issuance of grading permits. Enforcement/Monitoring: City of Shasta Lake Development Services Department, City of Shasta Lake Public Works Department MM 4.8.1b The developer shall submit an engineered geotechnical report during the design of the project grading plan to ensure compatibility with the engineering characteristics of underlying soils pursuant to Municipal Code Chapter 15.08 and as recommended in the Preliminary Geotechnical Report prepared by CGi (2011). The geotechnical report shall include chemical analysis of soils as recommended by the City Engineer to assess the potential for corrosion and reactivity with concrete. In areas where hillside slopes exceed 30 percent, the layout of proposed improvements, including roadways and structures, shall allow for adjacent usable space to ensure that all cut and fill slopes will not be steeper than 2 feet horizontal to 1 foot vertical. Timing/Implementation: Prior to approval of subsequent tentative subdivision maps or other discretionary permits, and/or issuance of grading permits. Enforcement/Monitoring: City of Shasta Lake Development Services Department, City of Shasta Lake Public Works Department	
Impact 4.8.2 Structures constructed as part of the project may be subject to lateral spreading.	LS	None required.	LS
Impact 4.8.3 The project site may contain a potential liquefaction hazard.	LS	None required.	LS

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Impact 4.8.4	Structures constructed as part of the project may be subject to landslides.	LS	None required.	LS
Impact 4.8.5	The project site may contain a potential subsidence hazard.	LS	None required.	LS
Impact 4.8.6	The project site may contain the potential for expansive soils.	LS	None required.	LS
Impact 4.8.7	Implementation of the proposed project in combination with reasonably foreseeable development would not contribute to cumulative geologic and soil impacts, as the impacts would be site-specific.	LCC	Implementation of mitigation measures MM 4.8.1a and MM 4.8.1b , as well as mitigation measures identified in Section 4.7, Hydrology and Water Quality, would ensure that the proposed project would not significantly contribute to cumulative geologic and soil impacts in the region.	LCC
Cultural Resources				
Impact 4.9.1	The proposed project at buildout could result in the potential disturbance of previously undiscovered cultural resources (e.g., prehistoric sites, historical sites, and isolated prehistoric and/or historic features or artifacts) and human remains.	PS	MM 4.9.1 Should any cultural resources, such as structural features, unusual amounts of bone or shell, artifacts, or architectural remains, be encountered during development activities, work shall be suspended and the City of Shasta Lake Development Services Department shall be immediately notified. At that time, the City will coordinate any necessary investigation of the discovery with an appropriate specialist (e.g., archaeologist, architectural historian, Native American tribe). The project applicant shall be required to implement any mitigation necessary for the protection of cultural resources. The City of Shasta Lake and the project applicant shall consider mitigation recommendations presented by a qualified archeologist for any unanticipated discoveries. The City and the project applicant shall consult and agree on implementation of a measure or measures that the City and the project applicant deem feasible and appropriate. Such measures may include avoidance, preservation in place, excavation, documentation, curation, data	LS

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		recovery, or other appropriate measures. Timing/Implementation: As a condition of project approval and implemented during construction activities Enforcement/Monitoring: City of Shasta Lake Development Services Department	
Impact 4.9.2 Implementation of the proposed project could result in the potential disturbance or destruction of sites CA-SHA-1082 and CA-SHA-1086.	LS	None required	LS
Impact 4.9.3 Implementation of the proposed project could result in the potential disturbance or destruction of site CA-SHA-1823.	PS	MM 4.9.3a Preservation of site CA-SHA-1823 is required through avoidance measures, including a 50-foot buffer distance around the site, from lands that will be directly impacted by buildout of the proposed project. Timing/Implementation: Prior to and during grading and construction activities Monitoring/Enforcement: City of Shasta Lake Development Services Department MM 4.9.3b Implementation of a long-term monitoring plan is required to ensure that impacts to the site will not accompany proposed buildout of and subsequent activities within the project area. The monitoring plan shall include the following information: Baseline Data: Take photographs of the site prior to any construction activity (road and commercial construction activities). These photographs will provide the baseline data for subsequent site inspections and monitoring of site conditions. A copy of the photographs shall be delivered to the landowner for permanent curation. Field Inspections and Reports: A professional archaeologist shall conduct field inspections at the site/preservation area, using the photographs taken in the baseline year as representing the “pristine” condition of the site, as follows:	LS

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		- The initial inspection shall be undertaken at the beginning of construction work, including road grading and land re-contour, and will continue for five years. The selected archaeologist shall prepare a summary report following each annual field inspection, in which the condition of the site and any observed impacts to it shall be summarized. If impacts to the site have occurred, the report shall detail appropriate treatment changes, based on specific findings and field observations. "Treatment changes" could include, but are not necessarily limited to, such actions as depositing boulders or other cover over or around the site deposit. - On the fifth annual inspection, the archaeologist shall render a conclusion as to whether additional annual inspections are necessary, or alternatively whether or not the program of annual inspections shall be terminated. In reaching a conclusion, the archaeologist shall consider several factors, including (1) the extent of any impacts to the site that have accompanied buildout and use of nearby lands, and (2) whether or not indigenous or other (exotic) vegetation might be adversely affecting the preservation area for which some specialized treatment might be recommended. 3. <u>Native American Consultation:</u> Prior to commencement of the initial field inspection and each annual inspection identified under MM 4.9.3b(2) above, affected/interested local tribal governments shall be notified to allow the tribes to provide their own on-site cultural resource	

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2.0 EXECUTIVE SUMMARY

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		monitor(s) during grading and activities. 4. Responsibility for implementing the long-term monitoring plan shall reside with the developer at the time of initial construction activity, transferring thereafter to the final property owner(s). Timing/Implementation: Prior to and during grading and construction activities Monitoring/Enforcement: City of Shasta Lake Development Services Department	
Impact 4.9.4 Implementation of the proposed project could result in the potential disturbance or destruction of sites CA-SHA-1085 and CA-SHA-1822.	PS	MM 4.9.4 1. Sites CA-SHA-1085 and -1822 shall be subjected to a focused data recovery effort with the primary goal of recovering dating samples (charcoal). In the process of recovering datable charcoal, additional cultural materials recovered shall be analyzed in comparison with previously recovered cultural material from the sites. The focused data recovery program shall proceed as identified in the Archaeological Inventory Survey for "Testing and Data Recovery Approach" as follows: - Excavation utilizing 1-meter-square exposures and in arbitrarily defined 10-centimeter levels, with all recovered material screened through ¼-inch mesh, unless very small objects (e.g., beads) are observed, in which case screening would shift to 1/8-inch mesh. - Submission of charcoal samples for radiocarbon analysis if material is recovered in suitable quantities and in sufficiently undisturbed contexts to warrant evaluation. - Evaluation of recovered cultural material in relation to local and regional typologies for various types of formed artifacts that might be exposed. - Preparation of a final report, to proceed in conformity with standard professional practices, designed to detail the information and research values of recovered cultural material. - For all sites subjected to data recovery excavation, recovered	LS

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		cultural material would be accessioned and the final report would include illustration of representative examples of formed artifact types, including especially diagnostic projectile points, beads, and other artifact types. All materials recovered during the project would be considered the real property of the property owner/project proponent, and would be returned to the property owner along with the final report for permanent curation. 2. <u>Native American Consultation:</u> Prior to commencement of the data recovery effort identified under MM 4.9.4a (1) above, affected/interested local tribal governments shall be notified to allow the tribes to provide their own on-site cultural resource monitor(s) during grading and activities. 3. Responsibility for implementing the long-term monitoring plan shall reside with the developer at the time of initial construction activity, transferring thereafter to the final property owner(s). Timing/Implementation: Prior to grading and construction activities Monitoring/Enforcement: City of Shasta Lake Development Services Department	
Impact 4.9.5 Implementation of the proposed project could result in potential disturbance or destruction of historic site CA-SHA-1824-H.	LS	None required	LS
Impact 4.9.6 Implementation of the proposed project could result in potential disturbance or destruction of historic site CA-SHA-1447-H.	LS	None required	LS
Impact 4.9.7 Implementation of the proposed project, along with any foreseeable development in the project vicinity, could result in cumulative impacts to cultural resources.	LCC	Implementation of mitigation measures MM 4.9.1 , MM 4.9.3a and MM 4.9.3b , and MM 4.9.4 would mitigate the project's contribution to the cumulative destruction of cultural resources to a less than cumulatively considerable level.	LCC
Utilities and Service Systems			
Impact 4.10.1.1 Buildout of the project would require the use of water supplies, which may exceed the City of Shasta	PS	MM 4.10.1.1 Prior to approval of subsequent development (i.e., further division of the property, conditional use permit, etc.), the	SU

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2.0 EXECUTIVE SUMMARY

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Lake's current water allotment during drought conditions.		project applicant must demonstrate water supply availability. The City may delay or deny subsequent projects based on water availability or drought conditions in effect at the time of project consideration. Timing/Implementation: Prior to approval of subsequent tentative subdivision maps or other discretionary approvals. Enforcement/Monitoring: City of Shasta Lake Development Services Department	
Impact 4.10.1.2 Buildout of the project would require water system upgrades, the construction of a reservoir, booster pump station and other improvements to serve the project site.	LS	None required	LS
Impact 4.10.1.3 Implementation of the proposed project, in combination with cumulative development, would increase the current demand for water supply service.	CC	Implementation of mitigation measure MM 4.10.1.1 .	CC & SU
Impact 4.10.2.1 Implementation of the proposed Mountain Gate at Shasta Area Plan would require the expansion or alteration of existing wastewater facilities to meet the Area Plan demand. Any future development in the areas of the proposed project may require the extension or alteration of existing wastewater treatment facilities.	PS	MM 4.10.2.1a Subsequent development under the Area Plan shall be responsible for all sewer infrastructure necessary to serve the proposed development. All sewer infrastructure shall be designed and constructed in accordance with City of Shasta Lake design criteria. Timing/Implementation: Prior to the issuance of building permits for each subsequent development project Enforcement/Monitoring: City of Shasta Lake Development Services Department MM 4.10.2.1b Project applicants shall be required to ensure wastewater service to future development within the Area Plan through the following means: Contribute a fair-share contribution toward the planning, engineering, and construction of all necessary off-site collection system improvements to serve the Area Plan. These improvements include, but may not be limited to:	LS

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		- Construction of a new lift station near the southerly boundary of the site, with a connection to the existing force main in Cascade Boulevard, north of Shasta Dam Boulevard. - Additional expansion of the Salt Creek Lift Station beyond that currently planned by the City to handle proposed development under the Area Plan. - Construction of a new force main from the Salt Creek Lift Station to the treatment plant, most likely following Pine Grove Boulevard from the Salt Creek Lift Station to the treatment plant. - Other improvements determined by the City Engineer to be required in order to serve future development. Timing/Implementation: Prior to recordation of subsequent tentative maps and/or prior to issuance of a building permit for any commercial development Enforcement/Monitoring: City of Shasta Lake Development Services Department	
Impact 4.10.2.2 Implementation of the proposed Mountain Gate at Shasta Area Plan would not result in the violation of wastewater treatment requirements.	LS	None required	LS
Impact 4.10.2.3 Implementation of proposed project in combination with other developments within the Shasta Lake Community Services District service area would increase wastewater flows and the current demand	CC	Implementation of mitigation measures MM 4.10.2.1a through 4.10.2.1c would not directly result in the needed wastewater disposal capacity to serve the Area Plan at buildout. However, it would guarantee that development could not be constructed without first obtaining a verification of wastewater disposal capability prior to the issuance of	LCC

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2.0 EXECUTIVE SUMMARY

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for wastewater treatment services.		building permits. Therefore, this impact is considered less than cumulatively considerable .	
Impact 4.10.3.1 Buildout of the project would cause a substantial increase in demand for solid waste disposal services.	PS	None required	LS
Impact 4.10.3.2 Buildout of the project would not increase the potential of non-compliance of AB 939 by the City by introducing additional waste into the solid waste stream.	LS	None required	LS
Impact 4.10.3.3 The division of the project site would cause a substantial increase in demand for solid waste disposal services.	LCC	None required	LCC
Impact 4.10.4.1 Implementation of the proposed project would increase demand for electric, propane, and telephone/cable services and require the extension of existing infrastructure.	PS	MM 4.10.4.1 The developer shall dedicate a minimum of 2 acres of land on the west side of the development for the placement of an electrical substation by the City of Shasta Lake to serve the project. Timing/Implementation: Identified prior to approval of subsequent tentative subdivision maps or other discretionary approvals. Enforcement/Monitoring: City of Shasta Lake Electric Department	LS
Impact 4.10.4.2 Implementation of the proposed project in addition to reasonably foreseeable developments would include the extension of existing infrastructure and require new facilities to accommodate the anticipated growth.	LCC	None required	LCC
Public Services			
Impact 4.11.1.1 Buildout of the proposed project would increase the demand for additional fire protection services and emergency medical services.	S	MM 4.11.1 Prior to occupancy of the 500th residential unit, applicant shall dedicate two (2) acres located within either Area H or Area I to the Shasta Lake Fire Protection District. The cost of construction of the fire station shall be borne by the Shasta Lake Fire Protection District (SLFPD). Timing/Implementation: Prior to issuance of a building permit for the 500th dwelling unit or construction of 50 percent of the commercial	LS

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		<i>development, or a combination of both as determined by the SLFPD during review of subsequent tentative subdivision map or other discretionary permits.</i> Enforcement/Monitoring: City of Shasta Lake Development Services Department; Shasta Lake Fire Protection District	
Impact 4.11.1.2 Buildout of the proposed project would locate homes and structures in an area identified by SLFPD as a hazard severity zone, which would expose residents to wildland fire hazards.	LS	None required	LS
Impact 4.11.1.3 The proposed project, in addition to foreseeable development, would increase the population within SLFPD service areas and require additional fire and emergency medical services.	LCC	None required	LS
Impact 4.11.2.1 Build-out of the proposed project would require additional police protection services.	PS	MM 4.11.2.1 In coordination with the City of Shasta Lake, all future development projects within the Area Plan shall participate in funding mechanisms designed to maintain the ratio of public safety officers to population, or population equivalent, at 1.5 officers per 1,000 residents. Timing/Implementation: Verification prior to approval of subsequent tentative subdivision maps or other discretionary permits. Enforcement/Monitoring: City of Shasta Lake Development Services Department	LS
Impact 4.11.2.2 The proposed project, in addition to foreseeable development, would increase the population within the City of Shasta Lake and require additional law enforcement services.	PCC	None required	LCC
Impact 4.11.3.1 Build-out of the proposed project will increase the number of school aged children and attendance to the Grand Oaks Elementary School.	LS	MM 4.11.3.1 The applicant shall set aside 10 acres within the Area Plan for potential future development of a new school by the Gateway Unified School District (GUSD). The 10 acres shall be made available for purchase by the GUSD for a period of three years from the date of the approval of the first small-lot tentative map. In the event the GUSD elects	LS

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City of Shasta Lake
April 2014

Mountain Gate at Shasta Area Plan
Draft Environmental Impact Report

2.0 EXECUTIVE SUMMARY

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		not to purchase the site, the applicant shall be permitted to subdivide the site for future development consistent with the Area Plan. Timing/Implementation: Reviewed prior to approval of any subsequent tentative subdivision maps Enforcement/Monitoring: City of Shasta Lake Development Services Department	
Impact 4.11.3.2 The proposed project, in combination with foreseeable development proposed in the City, would result in a cumulative increase in student enrollment.	LCC	None required	LCC
Impact 4.11.4.1 Build-out of the proposed project would increase the demand for additional park and recreational facilities.	LS	None required	LS
Impact 4.11.4.2 The proposed project and other foreseeable development would require additional park and recreation facilities in the City of Shasta Lake.	LCC	None required	LCC
Aesthetics			
Impact 4.12.1 Buildout of the proposed project could substantially alter scenic vistas of the surrounding natural area.	PS	MM 4.12.1 The project developer shall be required to ensure adequate screening of the proposed water storage tank with existing and/or newly planted vegetation. Timing/Implementation: Prior to approval of water storage tank improvement plan Enforcement/Monitoring: City of Shasta Lake Development Services Department	LS
Impact 4.12.2 Buildout of the proposed project would alter the existing landscape characteristics of the project site, as scene from Interstate 5, from primarily vacant to urban.	PS	MM 4.12.2a The proposed project shall be required to submit design guidelines that will regulate the design of all building and landscaping for the project. Residential and other building designs shall be required to utilize earth-tone colors and materials in their architectural design in order to complement the existing landscape features of the project area. No aboveground structures shall be allowed along	LS

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**Mountain Gate at Shasta Area Plan
Draft Environmental Impact Report**

**City of Shasta Lake
April 2014**

Impact	Level of Significance Without Mitigation	Mitigation Measure	Resulting Level of Significance
		ridgelines or hilltops on the project site in conformance with Municipal Code Section 15.08. The design guidelines shall be reviewed and approved by the City of Shasta Lake Development Services Department. Timing/Implementation: Prior to improvement plan submittal Enforcement/Monitoring: City of Shasta Lake Development Services Department MM 4.12.2b All project hardscape features, such as parking lots, shall be designed to blend with existing landscape characteristics. Such features shall be screened from off-site views through the use of native vegetation, landscaping, natural features, and other appropriate screening measures. Timing/Implementation: Prior to improvement plan approval Enforcement/Monitoring: City of Shasta Lake Development Services Department; City of Shasta Lake Department of Public Works MM 4.12.2c A landscape plan shall be submitted to the City of Shasta Lake. Landscaping shall consist of vegetation and features characteristic of the area and shall be installed prior to completion of the project. This screening is intended to blend development features into the landscaped characteristics of the area so as to not dominate the view. Timing/Implementation: Prior to improvement plan approval Enforcement/Monitoring: City of Shasta Lake Development Services Department, City of Shasta Lake Department of Public Works	
Impact 4.12.3 Buildout of the proposed project would convert approximately 354 acres of the project site from moderately disturbed land to a mixed-use urban development.	LS	None required	LS
Impact 4.12.4 Buildout of the proposed project would introduce some urban uses to a primarily undeveloped and rural area that currently includes few existing sources	PS	MM 4.12.4 Project design guidelines shall prohibit the use of reflective material and shall encourage the use of landscaping and other design features to minimize the	LS

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2.0 EXECUTIVE SUMMARY

Impact	Level of Significance Without Mitigation	Mitigation Measure	Resulting Level of Significance
of glare.		potential for glare. Timing/Implementation: Prior to improvement plan submittal/Included in the project design guidelines Enforcement/Monitoring: City of Shasta Lake Development Services Department; City of Shasta Lake Department of Public Works	
Impact 4.12.5 The proposed project at buildout would introduce new sources of nighttime lighting and glare, resulting in an increase to ambient nighttime lighting levels. Required street lighting will increase the source of night lighting within the area.	PS	MM 4.12.5a Outdoor light fixtures for nonresidential areas (such as the commercial center) shall be low-intensity, shielded, and/or directed away from residential areas and the night sky. All light fixtures shall be designed, installed, and shielded in such a manner that no light rays are emitted from the fixture at angles above the horizontal plane. Lighting plans shall be provided as part of facility improvement plans to the City that identify that illumination levels at adjacent residential areas will not exceed one foot-candle. Timing/Implementation: Prior to approval of building permits and/or improvement plans Enforcement/Monitoring: City of Shasta Lake Development Services Department; City of Shasta Department of Public Works MM 4.12.5b Outdoor lighting for nonresidential uses (i.e., commercial center) shall be designed to be turned off when not in use where security and safety is not a concern. This requirement shall be included in lighting plans submitted to the City as part of the facility improvement plans. Timing/Implementation: Prior to approval of building permits and/or improvement plans Enforcement/Monitoring: City of Shasta Lake Development Services Department; City of Shasta Department of Public Works MM 4.12.5c For outdoor lighting fixtures installed on residences and nonresidential buildings, project design guidelines shall restrict the installation of flood and/or spot lighting fixtures, except when used as part of landscaping. All light fixtures shall be shielded away from adjoining	LS

S – Significant

LS – Less Than Significant

SU – Significant and Unavoidable

NI – No Impact

PS – Potentially Significant

LCC – Less Than Cumulatively Considerable

CC – Cumulatively Considerable

Impact	Level of Significance Without Mitigation	Mitigation Measure	Resulting Level of Significance
		residents and the night sky. Project design guidelines shall be submitted to the City of Shasta Lake Planning Department for review and approval to verify that the lighting standards are in place. Timing/Implementation: Prior to issuance of building permits Enforcement/Monitoring: City of Shasta Lake Development Services Department	
Impact 4.12.6 Implementation of the proposed project would contribute to the cumulative conversion of the area from moderately disturbed open space to other urban uses.	LCC	None required	LCC
Greenhouse Gases and Climate Change			
Impact 4.13.1 Implementation of the proposed project would result in a net increase in GHG emissions, yet would not result in a significant impact on the environment.	LCC	None required	LCC
Impact 4.13.2 Implementation of the proposed project would result in a net increase in greenhouse gas emissions and could conflict with the goals of AB 32.	PCC	MM 4.13.2 Subsequent development projects within the Mountain Gate at Shasta Area Plan shall submit to the Shasta County Air Quality Management District and receive approval for a GHG Emissions Reduction Plan prior to issuance of building permits for the development project in question. The GHG Emissions Reduction Plan shall demonstrate adherence to the following measures, or alternative measures equaling the same or greater emission reduction values: - Indoor water conservation measures shall be incorporated, such as use of low-flow toilets, showers, and faucets (kitchen and bathroom), in each residential unit. (74 metric ton reduction) - The proposed project shall be designed to exceed state energy efficiency standards by 15 percent (to Tier 1 Title 24 Standards) as directed by Appendix A5 of the 2010 California Green Building Standards	LCC

S – Significant

LS – Less Than Significant

SU – Significant and Unavoidable

NI – No Impact

PS – Potentially Significant

LCC – Less Than Cumulatively Considerable

CC – Cumulatively Considerable

2.0 EXECUTIVE SUMMARY

Impact	Level of Significance Without Mitigation	Mitigation Measure	Resulting Level of Significance
		(CBSC 2011). This measure helps to reduce emissions associated with energy consumption. (347 metric ton reduction) • Low-water-use landscaping (i.e., drought-tolerant plants and drip irrigation) shall be installed. At least 75 percent of all landscaping plants shall be drought-tolerant as determined by a licensed landscape architect or contractor. (7 metric ton reduction) • The installation of wood-burning fireplaces shall be prohibited in all new residential units. (1,329 metric ton reduction. Required per mitigation measure MM 4.4.3a in Section 4.4) Timing/Implementation: Implemented prior to and during construction activities Enforcement/Monitoring: City of Shasta Lake Development Services Department; Shasta County Air Quality Management District	

S – Significant
PS – Potentially Significant

LS – Less Than Significant
LCC – Less Than Cumulatively Considerable

SU – Significant and Unavoidable

NI – No Impact
CC – Cumulatively Considerable

3.0 PROJECT DESCRIPTION

3.1 PROJECT LOCATION

PROJECT LOCATION

The proposed project is located in the northeastern corner of the City of Shasta Lake due west of Interstate 5 (I-5) between the Shasta Dam Boulevard interchange (Exit #685) and the Mountain Gate interchange (Exit #687). The City of Shasta Lake is located immediately south of Shasta Lake in western Shasta County. The project site, which is known locally as the Peri property, is located in Sections 20 and 29, Township 31 North, Range 5 West, of the Mount Diablo Meridian (see **Figure 3.0-1**).

SITE DESCRIPTION

Existing topography within the project site generally consists of relatively flat areas adjacent to I-5, with rolling hills and drainages at the south and western edges of the property. Existing site vegetation includes meadow with natural vegetation including valley oaks, foothill pine, manzanita, and grassland. Seasonal wetlands occur throughout the project site (see **Photos 3.0-1** and **3.0-2**). Except for informal trails and freeway-oriented advertising, the property is undeveloped.

PHOTO 3.0-1:
VIEW OF SHASTA BALLY PEAK LOOKING SOUTHWEST FROM
THE CENTER OF THE PROJECT AREA



PHOTO 3.0-2:
VIEW FACING WEST FROM
CENTER OF PROJECT AREA



3.2 PROJECT SETTING

The City of Shasta Lake is located at the northernmost extent of the central valley at the foothills of the Klamath Mountains and the Cascade mountain range. The project is located in the northeast portion of the city. The project site is bounded to the east by I-5, to the south and southwest by existing low-density residential development, and to the north and west by the city limits boundary. Lands to the west and north of the project area, located within the county, are currently vacant. The 2013 population of the city is estimated at 10,100, with approximately 4,178 housing units (DOF 2013) (see **Figure 3.0-1**).

3.0 PROJECT DESCRIPTION

Existing roadway access to the site is from Wonderland Boulevard, which dead-ends at the property gate adjacent to I-5. Access to the project site would be from the Mountain Gate interchange with I-5 at the north end of the project site and via a planned roadway extension of Wonderland Boulevard to Cascade Boulevard at the south end of the site. Emergency access would be provided via gated access to Black Canyon Road (see **Figure 3.0-2**).

3.3 PROPOSED PROJECT

SUMMARY

The City of Shasta Lake has received applications for a project that consists of the following elements: (1) General Plan Amendment, (2) rezone of entire project site, (3) approval of a Tentative Subdivision Map, (4) Area Plan adoption, and (5) Development Agreement.

General Plan Amendment

The project proposes a General Plan Amendment (GPA 11-01) that would redesignate approximately 141 acres of the project area as Mixed Use (MU) consistent with the remaining 449 acres of the site. This would entail redesignating approximately 23 acres of the site currently designated Urban Residential High (URH) and approximately 118 acres of the site currently designated Suburban Residential (SR). The remaining project area is currently designated MU consistent with the proposed use of the site. The General Plan Amendment would result in the entire 590-acre project area being designated MU (see **Table 3.0-5**). In addition, a Circulation Element Plan Line Amendment is proposed to change the location of the southerly General Plan road extension to Cascade Boulevard as shown in **Figure 3.0-7**.

Rezone

The project proposes a rezone (Z 11-02) to change the zoning of the entire 590-acre project site to Planned Development (PD) to reflect the proposed project.

The majority of the subject property is currently zoned Planned Development-Specific Plan (PD/SP). A 4.5-acre parcel at the southerly boundary of the site is currently zoned Multiple-Family Residential-Office (R-4) (see **Table 3.0-5**). This 4.5-acre property, identified in the Area Plan as Area R, was rezoned to R-4 in 2010 as part of the Shasta Lake Housing Element Implementation Program. Housing Element Implementation Measure 1.12 required the City to rezone land in the city to meet the Regional Housing Needs Allocation (RHNA). As identified in the Area Plan, Area R is designated for very high density development of up to 30 units per acre. This is consistent with the City's Housing Element.

Tentative Subdivision Map

The project proposes a Tentative Subdivision Map (SD 05-03) to allow the creation of 21 parcels (see **Figure 3.0-5**).

Area Plan

The project proposes adoption of the Mountain Gate at Shasta Area Plan, which is included as **Appendix 3.0-1** to this Draft EIR. The Area Plan could eventually lead to the creation of

approximately 1,604 dwelling units and up to 195,584 square feet of nonresidential development on approximately 590 acres (proposed project) (see **Figure 3.0-3**).¹

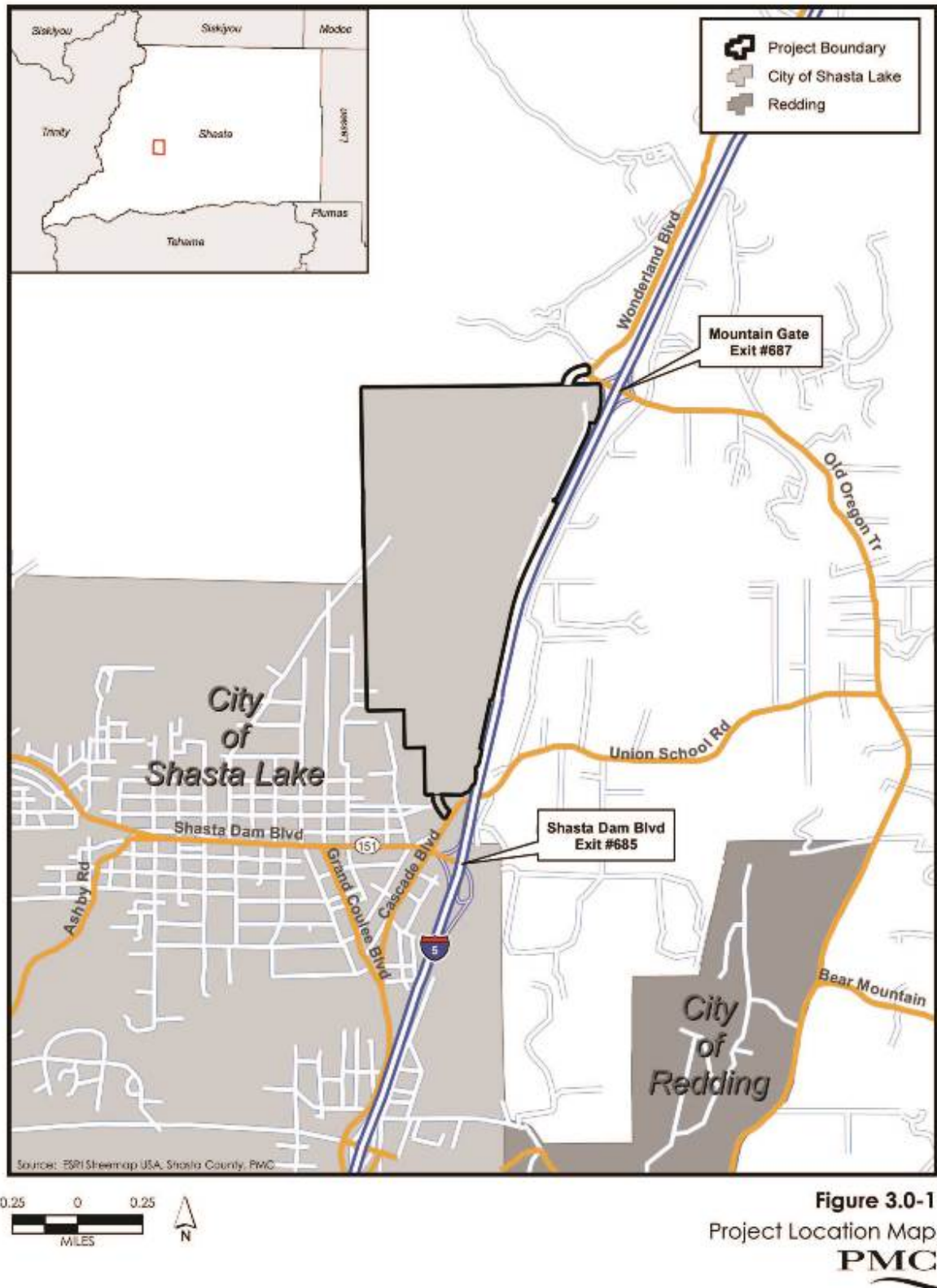
The Area Plan establishes land use designations and a circulation pattern for the project site. The Area Plan provides for different land use patterns and divides the property into areas A through U. As shown in **Table 3.0-1**, the Area Plan also provides for a mix of residential and nonresidential uses with differing densities.

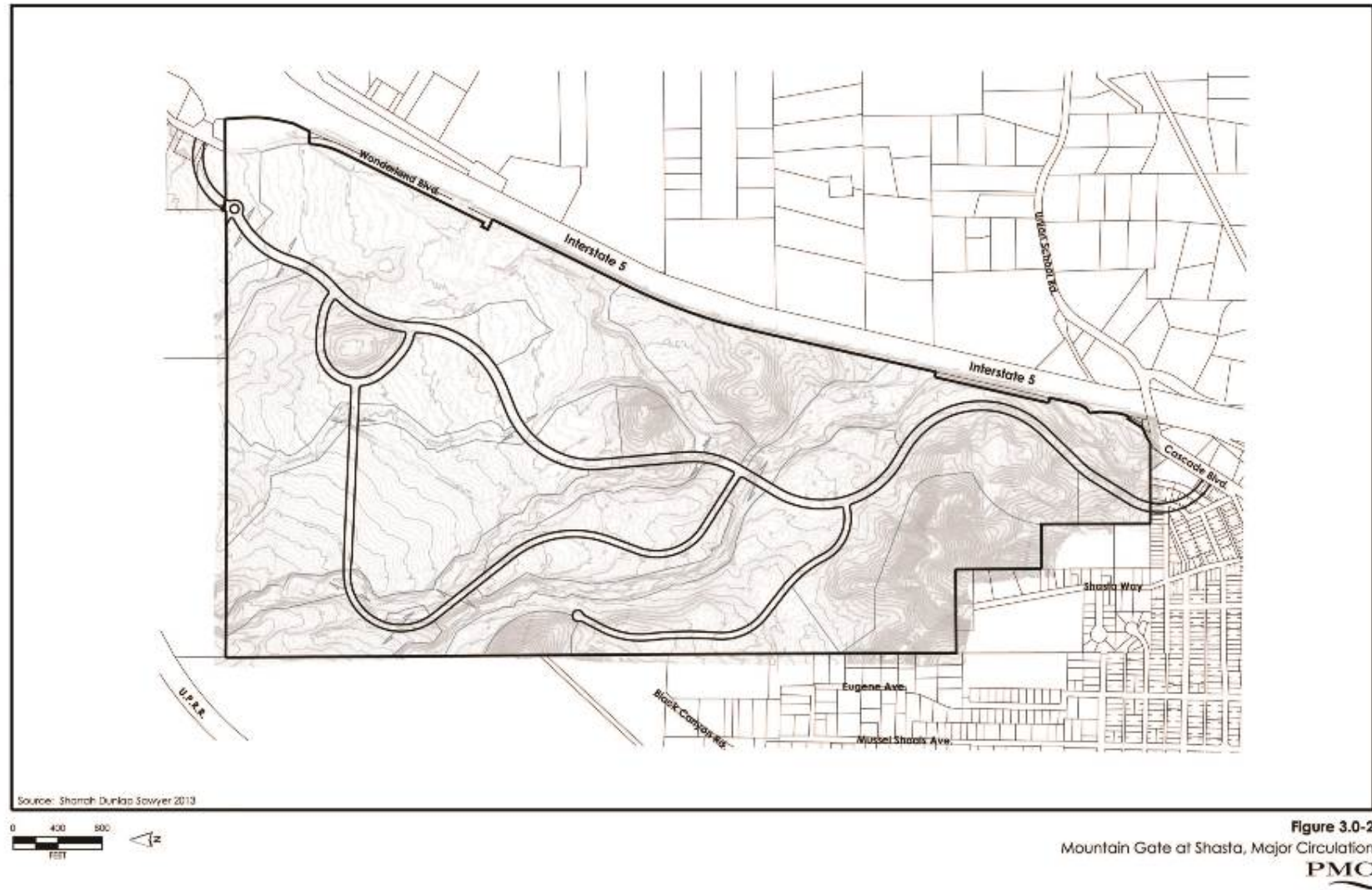
Development Agreement

A Development Agreement is proposed that sets forth the property owner's obligations related to the construction and financing of infrastructure and public services, including financial contributions for infrastructure maintenance.

¹ Zoning density is flexible and would allow for a theoretical maximum of 1,787 units. However, topography and site constraints would limit the overall density. Approximately 1,604 units is considered the development limit of the site in this Draft EIR.

3.0 PROJECT DESCRIPTION





3.0 PROJECT DESCRIPTION

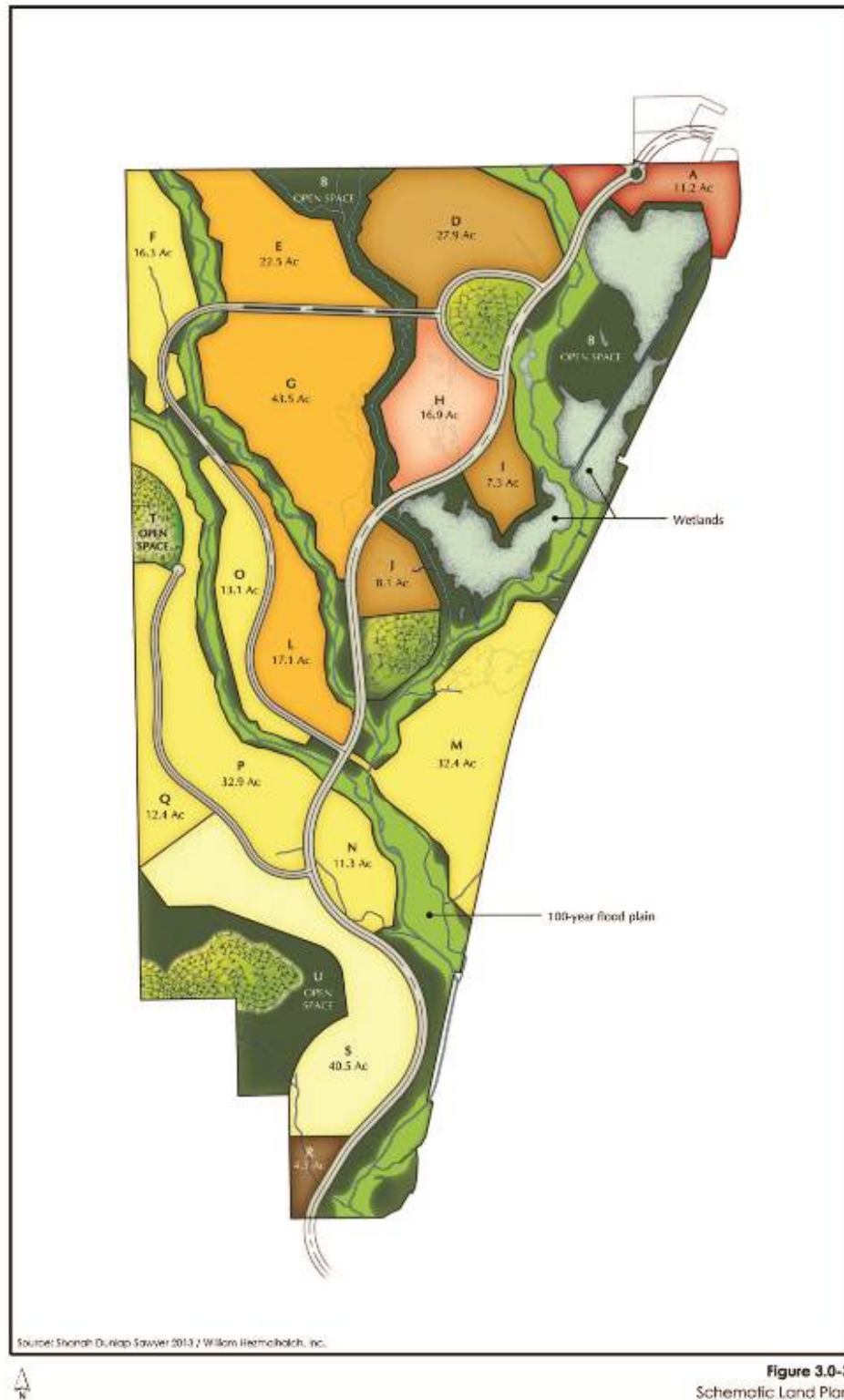


Figure 3.0-3
Schematic Land Plan
Mountain Gate at Shasta
PMC

Residential Uses

Housing types are expected to vary in each of the plan areas as project design incorporates the project site topography and site amenities. **Table 3.0-2** provides examples of possible housing types that will be constructed within the project boundaries. Several different housing types can occur in each of the plan areas; however, the Area Plan limits overall density in each area. Housing types for each of the areas will be determined at the time of submittal of subsequent subdivision maps.

Nonresidential Uses

Nonresidential land uses are concentrated in areas A and H as shown in **Figure 3.0-3** and **Table 3.0-1**. Area A allows for traditional commercial development; however, the uses in this area would be limited by the Planned Development zone proposed for the proposed project. Area H is intended as a mixed-use urban center and would contain both residential and nonresidential uses. This area may also contain live-work units with commercial and residential uses in the same building(s). Neighborhood Parks are identified for areas C and K as shown in **Figure 3.0-3**. A Community Park is identified in Area M as indicated in **Table 3.0-1**.

Table 3.0-3 provides an illustration of the nonresidential development areas and how these properties might be developed. The Area Plan requires that the architectural theme of these sites be consistent with the surrounding development. Development of parks would be consistent with the City of Shasta Lake Park System Master Plan, may include ball fields and playgrounds, and would be accessible by both roadways and trails.

Circulation

Access to the property is from Wonderland Boulevard and the Mountain Gate interchange with Interstate 5 from the north, and Cascade Boulevard intersecting with Shasta Dam Boulevard (State Route 151) from the south. A pedestrian and/or emergency roadway connection is proposed to allow access to Black Canyon Road to the west. The southerly extension of Wonderland Boulevard will involve the construction of improvements outside of the main development area of the proposed project.

An internal circulation system, in the form of roads and trails, would link all of the uses in the Area Plan. The system has been designed to encourage walking, biking, and other non-motorized uses. The trails would be located along biologically important areas, such as drainages and wetlands, as well as at the base of slopes. The proposed trails would be separated from roadways in some areas of the project site and adjacent to roadways in others. The Area Plan contains a schematic trail plan, a typical trail design section, and policies that require trail linkages for all land uses (see **Figure 3.0-4**). Policies in the Area Plan require that subsequent development connect to and extend any existing trail system.

The road network has been designed with a number of different street widths and designs so as to minimize the amount of grading and pavement needed to serve the Area Plan. Roadways within the Area Plan would generally be constructed as shown in **Table 3.0-4**, but may be modified as needed and approved by the City. All roads would be built in compliance with City of Shasta Lake standards.

Other design components of the Area Plan are discussed throughout the Draft EIR in sections appropriate for the environmental context.

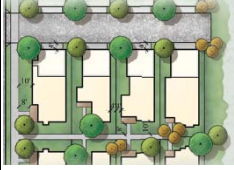
3.0 PROJECT DESCRIPTION

**TABLE 3.0-1
MOUNTAIN GATE AT SHASTA AREA PLAN LAND USE**

Area1	Primary Land Use2	Acres3	Max. Building Coverage or FAR4	Potential Sq.Ft.5	Density Range	Unit Range	Probable Maximum Units6
A	Commercial	11.2	0.25	121,968	–	–	0
B	Open Space	181.5	0.1	–	–	–	0
C	Park	7.3	0.1	–	–	–	0
D	Medium Density Residential	27.9	0.7	–	4–7	112–195	176
E	Medium Density Residential	22.5	0.7	–	4–7	90–158	142
F	Very Low Density Residential	16.3	0.5	–	1–2	16–33	30
G	Medium Density Residential	43.5	0.7	–	4–10	174–435	392
H	Mixed Use Commercial	14.9	0.1	73,616	–	–	0
	High Density Mixed Use		0.7	–	11–20	131–238	215
	Fire Station	2	0.7	–	–	–	0
I	Medium Density Residential	7.3	0.7	–	4–7	29–51	46
J	Medium Density Residential	8.1	0.7	–	4–7	32–57	51
K	Park	7.6	0.1	–	–	–	0
L	Low Density Residential	17.1	0.5	–	2–4	34–68	61
M	Community Park	13	1.5		2–4	39–78	0
	Low Density Residential	19.4	0.5				70
N	Low Density Residential	11.3	0.5	–	2–4	23–45	41
O	Low Density Residential	13.1	0.5	–	2–4	26–52	47
P	Low Density Residential	32.9	0.5	–	2–4	66–132	119
Q	Very Low Density Residential	10.4	0.5		1–2	10–21	19
	Electric Substation	2	0.7				0
R	High Density Residential	4.5	0.7	–	11–30	50–135	122
S	Very Low Density Residential	40.5	0.5	–	1–2	41–81	73
T	Open Space	5.9	0.1	–	–	–	0
U	Open Space	33.6	0.1	–	–	–	0
R.O.W.	Rights-of-Way	36.2	–	–	–	–	0
Totals		590.0	–	195,584	–	873–1,779	1,604

1. See Figure 3.0-3 for location of land use areas.
2. Several identified public uses (i.e., parks, fire station, electric substation) are likely to occur as indicated; however, it is possible that public uses will be located in other development areas, other land in the city, or removed from the Area Plan. In this instance, the development potential of the property formerly intended for the public use shall be equal to that of the lowest density in the same development area, provided the overall number of units does not exceed 1,604 as shown in the table.
3. All acreages are estimates.
4. Floor area ratio for nonresidential uses only, Maximum building coverage for residential uses.
5. Maximum potential square footage of all structures within the land use designation.
6. Topography and site constraints would limit the overall density. Approximately 1,604 units is considered the development limit of the site in this Draft EIR

**TABLE 3.0-2
MOUNTAIN GATE AT SHASTA RESIDENTIAL DESIGN SUMMARY**

Housing Type	Typical Site Placement	Possible Elevations
Small Lot Medium Density		
Medium Lot Low-Medium Density		
Large Lot Low-Very Low Density		
Town Home Medium-High Density		
Multi-Family High-Very High Density		
Alley Loaded Medium Density		
Green Court Medium Density		
High-Very High Density		

Areas designated as parkland would not have residential or commercial development, but may have structures designed to enhance the recreational uses.

3.0 PROJECT DESCRIPTION

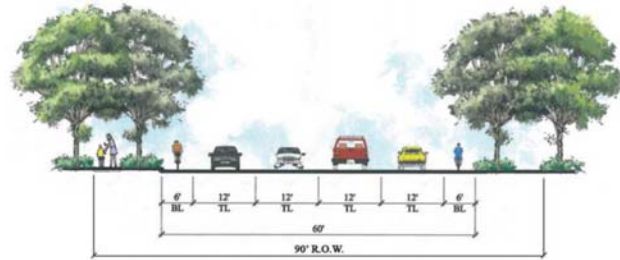
TABLE 3.0-3
MOUNTAIN GATE AT SHASTA NONRESIDENTIAL DESIGN SUMMARY

Use Type	Potential Site Plan	Possible Elevations
Parkland		
Mixed Use High Density		
Neighborhood Retail		

TABLE 3.0-4
MOUNTAIN GATE AT SHASTA ROADWAY SECTIONS

Arterial Road –

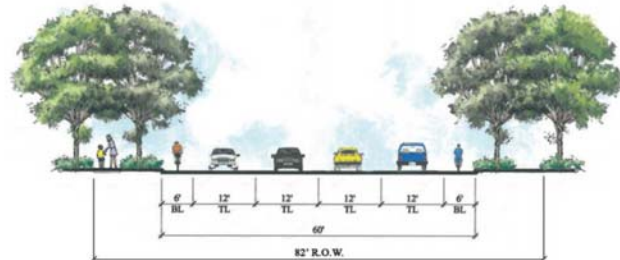
Includes separated sidewalks, street trees and bike lanes; can be modified to include a landscaped center median.



90' Right-of-Way Arterial Road

Arterial Road –

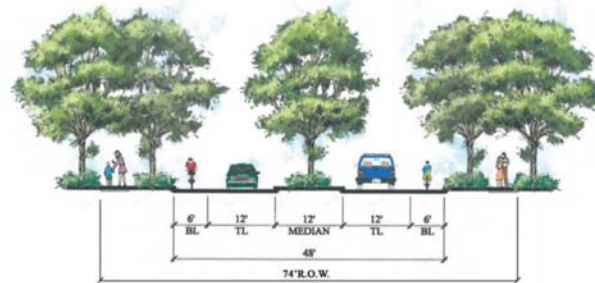
Includes separated sidewalks, street trees and bike lanes; can be modified to include a landscaped center median.



82' Right-of-Way Arterial Road

Residential Street –

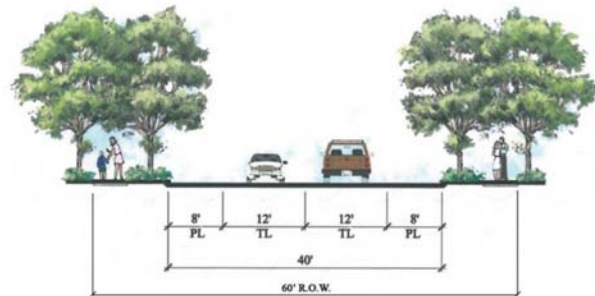
Includes landscaped center median, separated sidewalks, street trees and bike lanes.



74' Residential Collector with Median

Residential Street –

Includes separated sidewalk; can be modified to include bike lanes and restrict on-street parking



60' Residential Collector

3.0 PROJECT DESCRIPTION



Figure 3.0-4
Neighborhood Trail Map
Mountain Gate at Shasta



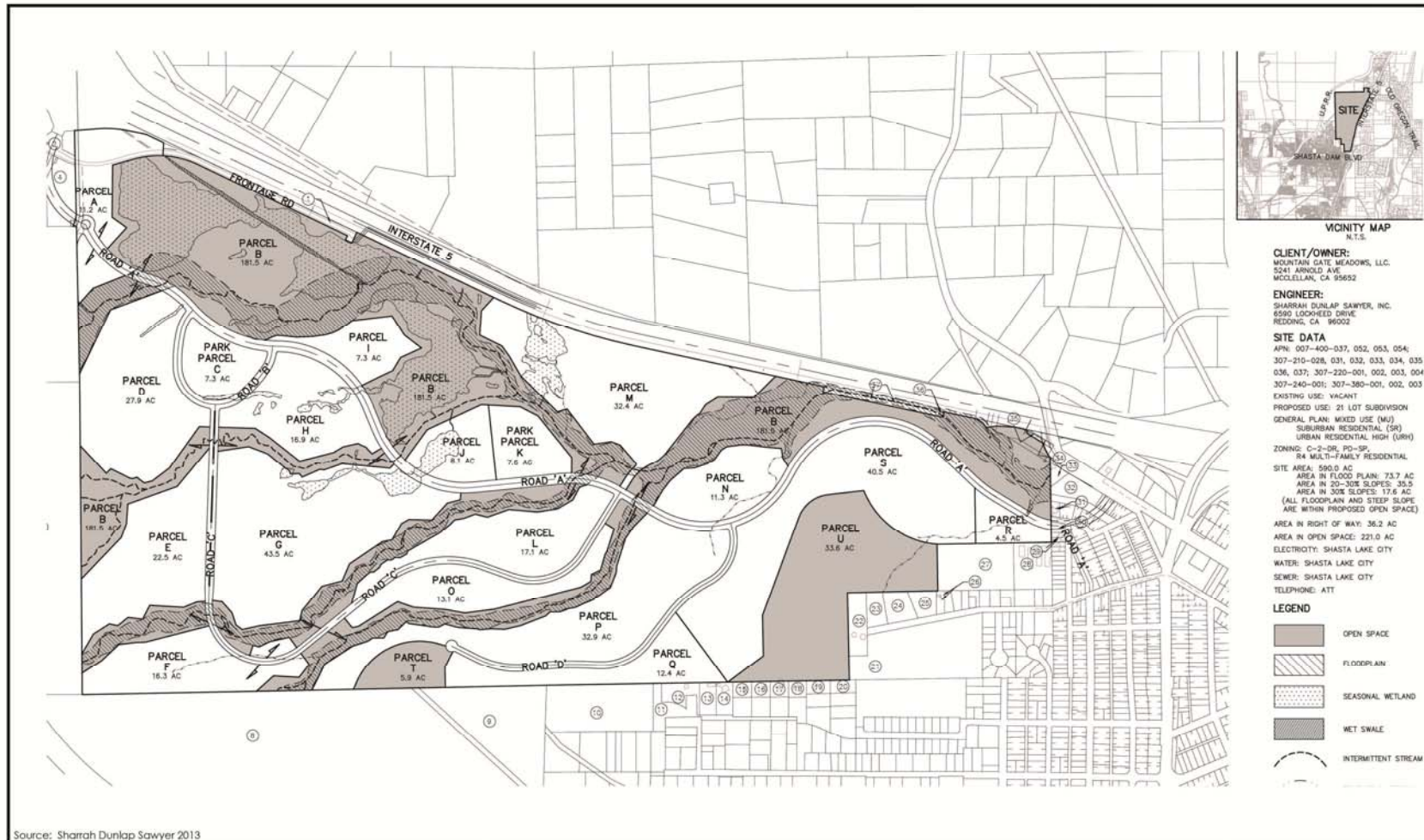


Figure 3.0-5
Tentative Map
PMC

3.0 PROJECT DESCRIPTION

3.4 PROGRAM-LEVEL COMPONENTS

RESIDENTIAL UNITS

Buildout of the project is expected to result in approximately 1,604 housing units and approximately 195,584 square feet of nonresidential space. If the current occupancy factor of 2.58 persons per household is assumed and all residents are new to the city, the proposed project could result in approximately 4,138 new residents. This would result in an increase of approximately 41 percent over the current population in the city. Construction of the project is anticipated to be phased, and buildout may take between 15 and 25 years.

PHASED DEVELOPMENT

Phasing of the project, as shown in **Figure 3.0-6**, is expected to start at the north end of the project site and proceed south. The utilities, and at least a portion of the roadway that will form the primary access through the site, would be constructed as part of the first phase. The phase boundaries are intended to be conceptual and may be amended, revised or combined as development progresses.

The project design does not currently include the division of land for single development purposes. The project applicant would be required to submit tentative subdivision maps for future development of residential areas in all phases of the development for City consideration and would be subject to future environmental review for project-level details in addition to the analysis provided in this Draft EIR.

3.5 PROJECT-LEVEL COMPONENTS

PLANNED DEVELOPMENT ZONE DISTRICT (PD)

The proposed Planned Development (PD) zone district for the project site is intended to implement the policies of the Area Plan and provide a single code for development review. The PD is included in its entirety in this Draft EIR as **Appendix 3.0-2** and will be referenced in appropriate sections of the document. The PD addresses issues such as allowable uses, setbacks, parking, and other development-oriented regulations. **Table 3.0-5** summarizes the proposed land use and zone change by parcel number within the Area Plan.

Table 3.0-6 identifies the permitted and conditionally permitted uses as set forth in the PD zone district proposed for the project site. The uses are based on the City's General Plan and Zoning Ordinance, but have been modified to permit a wider variety of housing types and mixed use consistent with the Area Plan.

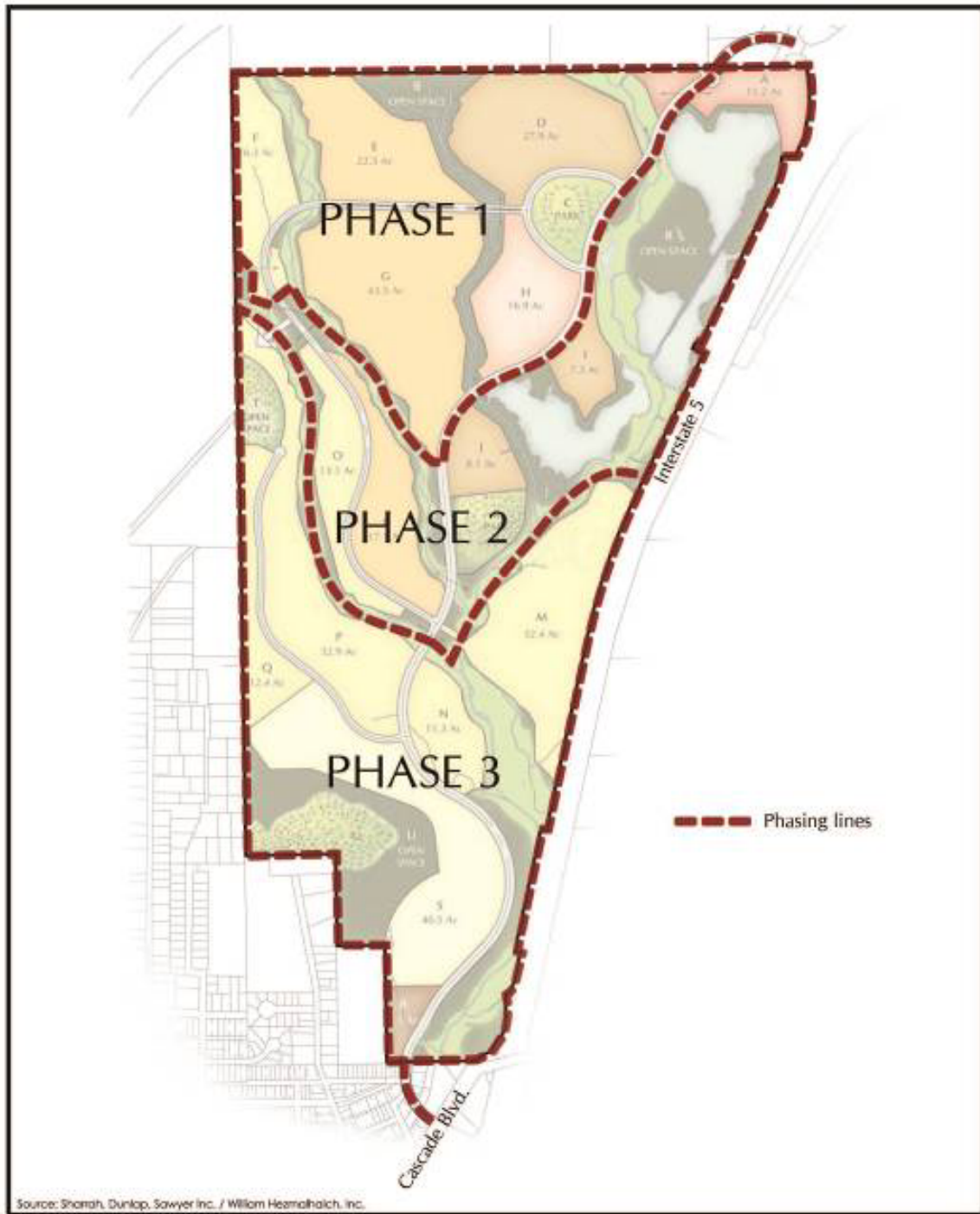


Figure 3.0-6
Phasing Plan
Mountain Gate at Shasta
PMC

3.0 PROJECT DESCRIPTION

**TABLE 3.0-5
GENERAL PLAN/ZONE CHANGE REQUEST**

Assessor's Parcel Number	Acres	Current General Plan Land Use Designation	Proposed General Plan Land Use Designation	Current Zoning	Proposed Zoning
007-400-037 (Portion)	18.5	Urban Residential High	Mixed Use	Planned Development Specific Plan	Planned Development
007-400-037 (Portion)	4.5	Urban Residential High	Mixed Use	Multiple-Family - Office	Planned Development
007-400-053	118	Suburban Residential	Mixed Use	Planned Development Specific Plan	Planned Development
007-400-052, 054	75	Mixed Use	Mixed Use	Planned Development Specific Plan	Planned Development
307-210-028, 031, 032, 033, 034, 035, 036, 037	230	Mixed Use	Mixed Use	Planned Development Specific Plan	Planned Development
307-220-001, 002, 003, 004	56	Mixed Use	Mixed Use	Planned Development Specific Plan	Planned Development
307-240-001	3	Mixed Use	Mixed Use	Planned Development Specific Plan	Planned Development
307-380-001, 002, 003	79	Mixed Use	Mixed Use	Planned Development Specific Plan	Planned Development
Rights-of-Way	6	–	–	–	–
Total Acreage: 590 acres					

TENTATIVE SUBDIVISION MAP

A large-lot Tentative Subdivision Map is requested as part of the approval process for the proposed project (see **Figure 3.0-5**). This map would provide a single roadway connection between the Mountain Gate/Wonderland Boulevard interchange to the north and Cascade Boulevard to the south. The alignment of the roadway would also contain the major water and sewer conduits connecting the proposed project to the existing City of Shasta Lake utilities. The proposed map divides the property into 21 large parcels intended for future division consistent with the Area Plan.

**TABLE 3.0-6
PLANNED DEVELOPMENT ZONE DISTRICT
PERMITTED AND CONDITIONALLY PERMITTED USES**

P: Use permitted outright

AD: Use permitted after review and approval of an Administrative Permit by the Development Services Director or his/her designee

UP: Use permitted after review and approval of a Use Permit by the Planning Commission

Z: Use permitted after review and approval of a Zoning/Site Development Permit by the Development Services Director or his/her designee

– Use not permitted

Accessory dwelling units (second units) are allowed pursuant to SLMC Chapter 17.81, Affordable Housing

Land Use	Area A	Areas F, Q, S	Areas L, N, O, P	Area M	Areas D, E, G, I, J	Area R	Area H
	Commercial	Very-Low Density	Low Density	Low Density, Community Park	Medium Density	High Density	Mixed Use
Residential							
Single-Family	-	P	P	P	P	-	-
Two-Family	-	-	-	-	-	AD	Z
Multiple-Family (apartments)	-	-	-	-	-	AD	AD
Condominiums	-	-	-	-	-	AD	AD
Live-Work Units	-	-	-	-	-	-	Z
Non-dwelling accessory structures appurtenant to the permitted use	P	P	P	P	P	P	P
Small Family Daycare Home (six or fewer)	-	P	P	P	P	P	P
Large Family Daycare Home (seven or more)	-	AD	AD	AD	AD	AD	AD
Bed and Breakfast Guest Facility	-	AD	AD	AD	AD	-	AD
Home Occupation Business per SLMC 17.88.220	-	Z	Z	Z	Z	Z	Z

3.0 PROJECT DESCRIPTION

Land Use	Area A	Areas F, Q, S	Areas L, N, O, P	Area M	Areas D, E, G, I, J	Area R	Area H
	Commercial	Very-Low Density	Low Density	Low Density, Community Park	Medium Density	High Density	Mixed Use
Commercial							
Automobile/Vehicle Service and Repair: Gasoline, diesel, propane, butane, fuel oil dealers/stations Gasoline station convenience mini-marts Oil, tune-up, brake and muffler shops Tire sales and installation Self-serve and non-self-serve auto wash Small engine repair (excludes body and fender work, vehicle painting, towing, vehicle dismantling, or repair of heavy trucks or construction vehicles)	UP	-	-	-	-	-	-
Automobile Sales and Leasing: automobiles, trucks, motorcycles, lawn and garden-type tractors	AD	-	-	-	-	-	-
Bars, Nightclubs, Wine Tasting, Brewery	UP	-	-	-	-	-	-
Eating and Drinking Establishment (no drive-thru)	P	-	-	-	-	-	AD
Eating and Drinking Establishment (with drive-thru)	Z	-	-	-	-	-	-
Hotel/Motel	UP	-	-	-	-	-	-
Instructional Services or Facilities: health/fitness club, dance or music studio, driving school, photography, arts and crafts	Z	-	-	-	-	-	Z
Offices: administrative, executive, insurance, legal, medical, professional, real estate, travel agency, etc.	P	-	-	-	-	-	P
Personal Service Uses: barber, beauty salon, day spa, tattoo parlor, locksmith, shoe repair, computer repair, print shop, laundromat	P	-	-	-	-	-	P
Recreation/Entertainment: movie theater, miniature golf, bowling alley, ice/roller skating rink, tennis/racquetball courts, pinball arcades/electronic games centers, pool/card rooms	AD	-	-	-	-	-	UP

Land Use	Area A	Areas F, Q, S	Areas L, N, O, P	Area M	Areas D, E, G, I, J	Area R	Area H
	Commercial	Very-Low Density	Low Density	Low Density, Community Park	Medium Density	High Density	Mixed Use
Small Retail Sales (under 15,000 square feet for single tenant): grocery/food/beverage market, florist, bookstore, drug store, pet store, hardware store, furniture, appliances, electronics, variety store	Z	-	-	-	-	-	Z
Large Retail Sales (over 15,000 square feet): grocery store, home improvement center, discount or wholesale retail sales	AD	-	-	-	-	-	UP
Temporary Uses: farmers markets, produce sales, carnivals, Christmas tree or pumpkin sales	Z	-	-	Z	-	-	Z
Veterinarian/Animal Hospital (no outdoor kennels)	Z	-	-	-	-	-	UP
Public and Semi-Public Facilities							
Public Government Offices	P	-	-	-	-	-	P
Fire Station*	AD	-	-	*	*	-	AD
Law Enforcement Substation (no jail)	UP	-	-	-	-	-	UP
Public utility substations, structures, facilities, water tanks, etc.	Z	Z	Z	Z	Z	Z	Z
Park and Recreation Facilities: public park, playground, sports fields, gymnasiums, swimming pools, picnic facilities, including related food concessions*	AD	-	-	P	-	Z	AD
College and Trade School, public or private	P	-	-	-	-	-	P
Schools, K-12, public or private *	AD	-	-	AD	AD	-	AD
Nursery School, Preschool (licensed or certified by the state)	P	-	-	-	-	AD	P
Day Care Center (licensed or certified by the state for 14 or more) for children or adults	P	-	-	-	-	-	P
Clubs and Lodges	AD	AD	AD	AD	AD	AD	AD

3.0 PROJECT DESCRIPTION

Land Use	Area A	Areas F, Q, S	Areas L, N, O, P	Area M	Areas D, E, G, I, J	Area R	Area H
	Commercial	Very-Low Density	Low Density	Low Density, Community Park	Medium Density	High Density	Mixed Use
Conference Center, Meeting Hall	AD	AD	AD	AD	AD	AD	AD
Community Center, Youth Center, Senior Center	AD	AD	AD	AD	AD	AD	AD
Religious Facilities (church, temple, synagogue, shrine, mosque, etc.) used exclusively for religious worship and incidental accessory uses	AD	AD	AD	AD	AD	AD	AD
Cultural Institution: library, museum, art gallery, performance art center, amphitheater	P	-	-	AD	-	-	P
Amphitheater/Performance Center – Outdoor	P	-	-	P	-	-	AD
Commuter Parking Lot	P	-	-	-	-	-	P
Electric Charging Station	P	-	-	P	P	P	P

* Several identified public uses (i.e., parks, fire station, electric substation) are likely to occur as indicated in Table 3.0-1; however, it is possible that public uses will be located in other development areas as reviewed and approved by the Development Services Director or his/her designee if found to be consistent with the intent of the Area Plan.

OFF-SITE IMPROVEMENTS

The proposed project would involve work outside of the Area Plan boundaries.

A roadway extension will be required at the southerly boundary of the site. The current General Plan shows the roadway extension connecting to Shasta Way; however, due to traffic safety concerns at the intersection of Shasta Way/Shasta Street and Shasta Dam Boulevard, the project proposes to connect to Cascade Boulevard as shown in **Figure 3.0-7**. The proposed alignment also impacts fewer privately owned parcels than the current General Plan alignment, which is also shown on **Figure 3.0-7**. The project includes a Plan Line Amendment to designate the extension to Cascade Boulevard as the new General Plan roadway.

The existing Wonderland Boulevard roadway located parallel to I-5 would be abandoned and replaced with a new main roadway proposed in the Area Plan (see **Figure 3.0-2**). This new roadway would provide the primary access to the Mountain Gate interchange with I-5. While the property across which the new roadway must be constructed is owned by the project applicant, the property is outside of the City of Shasta Lake and is within the jurisdiction of Shasta County. Work on the roadway may require an encroachment permit and maintenance agreement between the City of Shasta Lake and Shasta County.

Extension of water and wastewater collection systems to the site would be required and would involve work to tie the water and sewer to existing infrastructure south of the project. The proposed project would require the construction of a 1.0 million gallon (mg) water storage tank (see **Figure 4.10-1, Mountain Gate at Shasta Water Delivery System**) and a trunk main from the tank, west to the project site. The proposed water system would also be required to connect to the existing 10" water main located in Shasta Dam Blvd. The likely route of this main from the south end of the project site would follow the General Plan alignment of the street to Shasta Dam Blvd and Shasta Way, regardless of whether a road is required in that location or not. The proposed project would also require the extension of a sanitary sewer main from the south end of the site and construction of a new lift station in the southerly section of the site as shown on **Figure 4.10-2**.

The required 1.0-million-gallon reservoir is proposed to be constructed on a knoll northwest of the project boundary at an elevation of approximately 1010 feet above mean sea level. According to the City of Shasta Lake's Master Water Plan the bottom of the tank must be constructed at a minimum elevation of 985 in order to operate as a gravity system. This off-site tank location is on land currently owned by 3M. In the event the developer and/or City of Shasta Lake is unable to acquire the land for the tank site and easements for water mains to provide water to the tank as well as a water main from the tank to the Mt. Gate property an alternative tank location on-site has been considered.

The alternative on-site water tank would be located just south of the project's north boundary line as shown on Figure 4.10.1. The proposed on-site tank would be located on a knoll with an elevation of only 895, approximately 90 feet below the required minimum location for the tank to operate as a gravity tank. Due to the lower elevation of this alternative site this location would require the construction of a booster pump system in order to provide adequate pressure to the zone which it will serve. This alternative tank location can be fed with water mains through the project site avoiding the need to obtain easements for the system to serve the Mt. Gate project.

3.0 PROJECT DESCRIPTION

The project will require a new substation converting 115 kilovolts (kV) to 12 kV to properly service the development. This station would require the dedication of 2 acres on the west side of the development. The City of Shasta Lake proposes to build a looped 115 kV line up the railroad right-of-way and into the station. All distribution lines at 12 kV would be undergrounded.

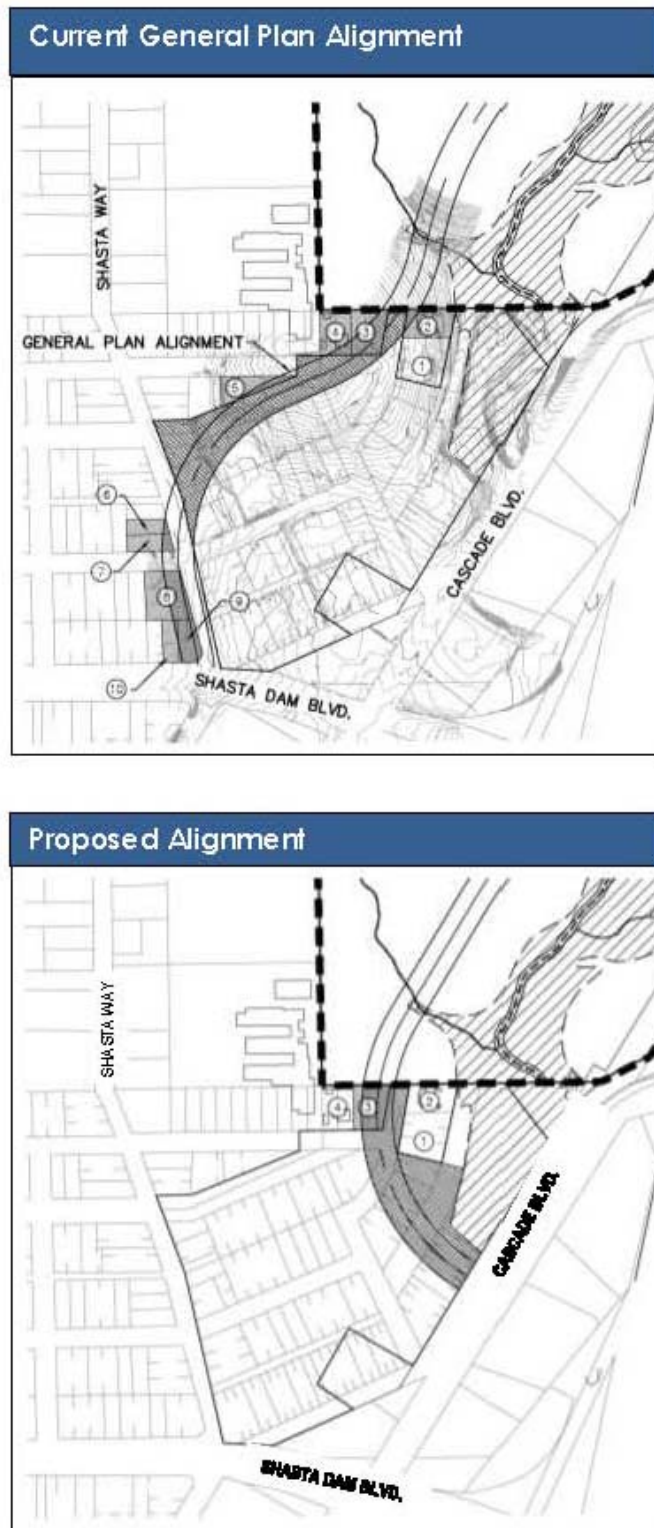


Figure 3.0-7
 Southerly Roadway Connection
 Mountain Gate at Shasta

3.0 PROJECT DESCRIPTION

DEVELOPMENT AGREEMENT

The applicant will enter into a Development Agreement with the City, as permitted pursuant to Government Code 65864 et seq. The Development Agreement sets forth the property owner's obligations related to the construction and financing of infrastructure and public services, including financial contributions for infrastructure maintenance and other obligations that may be imposed by the City as a condition of development. The Development Agreement would vest the property with the right to proceed with development subject to the limitations and obligations of the Development Agreement and the Area Plan as approved by the City Council.

3.6 PROJECT OBJECTIVES

The following project objectives have been identified:

- Provide a comprehensively planned project that is sensitive to environmental issues including wetlands, flood protection, the City's hillside grading concerns, and tree preservation.
- Protect the highest quality natural features and resources of the site.
- Conform to General Plan policies that designate the project site for urban development through implementation of an Area Plan.
- Promote compact mixed-use development that strives to provide a balance of uses, diverse housing and transportation choices, and contributes to a jobs-to-housing balance within the region.
- Provide a balanced mix of land uses that will allow a self-sufficient community, thereby reducing demands on regional roadways and services.
- Provide for a full range of housing densities and product choices affordable to a broad spectrum of income levels.
- Provide a master-planned community on a suitable site of sufficient size in proximity to an existing freeway, with access from existing interchange facilities.
- Establish a circulation system that meets local and regional transportation needs and accommodates a variety of transportation modes, including off-street trail systems and on-street bicycle lanes.
- Establish a pedestrian-friendly community that provides a continuous system of trails to link neighborhoods together and provide safe routes to parks and community-serving areas.
- Provide required park facilities sized to meet the needs of residents in the Area Plan and located as neighborhood focal elements.
- Provide a comprehensively planned infrastructure system (e.g., water treatment and distribution systems, sewer treatment and collection systems, electrical distribution systems, fire suppression facilities, general government facilities) to serve the needs of future residents of the development area.

- Provide adequate infrastructure improvements without adversely affecting existing levels of service.
- Phase development and infrastructure to respond to market demand while requiring new development to provide the infrastructure and public facilities necessary to serve the developing area.
- Establish financial mechanisms to ensure that the full range of services needed to serve the Area Plan are funded by the community and not by existing city residents.
- Provide revenue for the maintenance of public open space areas and park facilities, infrastructure, and public services within the development area.

3.0 PROJECT DESCRIPTION

REFERENCES

DOF (California Department of Finance). 2013. *E-5 City/County Population and Housing Estimates*. <http://www.dof.ca.gov/research/demographic/reports/view.php>.

4.0 INTRODUCTION TO THE ENVIRONMENTAL IMPACT ANALYSIS

4.0 INTRODUCTION TO THE ENVIRONMENTAL IMPACT ANALYSIS

4.0.1 FORMAT OF ISSUE SECTIONS

Sections in this chapter describe, for each environmental issue area, (1) the environmental setting as it relates to the specific issue; (2) the regulatory framework for the issue as applicable to the project; (3) significance criteria and the methodology used to assess impacts; and (4) an evaluation of project-specific and cumulative impacts, identification of mitigation measures, and a determination of the level of significance after mitigation measures are implemented. Each section is organized into five parts: Existing Setting; Regulatory Framework; Impacts and Mitigation Measures; Cumulative Setting, Impacts, and Mitigation Measures; and References.

The **Existing Setting** subsection describes the existing conditions pertaining to the issue at the regional, local, and project site levels, as appropriate.

The **Regulatory Framework** identifies plans, policies, laws, and regulations at the federal, state, and local levels that are applicable to the particular issue.

The **Impacts and Mitigation Measures** subsection begins with a description of the significance criteria used to evaluate project impacts, followed by a description of the methodology used to assess impacts. Next are the individual impact statements, which include explanatory text and technical information necessary to formulate a conclusion, followed by a discussion of potential project-specific impacts. Where necessary, each impact discussed is followed by a description of the proposed mitigation and a statement of the level of impact following mitigation.

The **Cumulative Setting, Impacts, and Mitigation Measures** subsection describes the cumulative setting appropriate to that subject area. For example, some air quality impacts are of a regional nature and the cumulative setting includes the entire air basin, while stormwater impacts would be specific to the local drainage basin. Next are individual impact statements, which include explanatory text and technical information necessary to formulate a conclusion, followed by a discussion of potential cumulative impacts. Where necessary, each cumulative impact is discussed and the project's contribution to that cumulative impact is identified, followed by a description of the proposed mitigation and a statement of the level of impact following mitigation.

The **References** subsection lists the documents, personal communications, and other sources of information cited or otherwise used in the preparation of the section.

4.0.2 DETERMINING LEVEL OF SIGNIFICANCE

Determining the severity of project impacts is fundamental to achieving the objectives of the California Environmental Quality Act (CEQA). CEQA Guidelines Section 15091 requires that decision-makers make findings that significant impacts identified in the Final EIR have been mitigated as completely as feasible. If the EIR identifies any significant unmitigated impacts and the agency decides to approve the project, CEQA Guidelines Section 15093 requires decision-makers to adopt a statement of overriding considerations, which explains why the benefits of the project outweigh the adverse environmental consequences identified by the EIR.

The level of significance for each impact examined in this EIR was determined by considering the predicted magnitude of the impact against a threshold. Thresholds were developed using criteria from the CEQA Guidelines, local/regional plans and ordinances, and/or consultation with recognized experts. Thresholds are identified in each chapter under Standards of Significance.

4.0 INTRODUCTION TO THE ENVIRONMENTAL IMPACT ANALYSIS

Four levels of impact significance are recognized by this Draft EIR:

- **Less than significant** impacts would not cause a substantial change in the environment or are not disruptive enough to require mitigation.
- **Potentially significant** impacts may cause a significant effect on the environment, but information is lacking regarding the extent of the impact. This designation may be applied to impacts for which information is incomplete or unavailable or to impacts that are qualitative in nature and cannot be readily quantified. For CEQA purposes, a potentially significant impact is treated as if it were a significant impact. Mitigation measures are identified to reduce potential impacts to a level that is less than significant.
- **Significant** impacts would cause a substantial adverse change in the physical conditions of the environment. Significant impacts are identified by the evaluation of the project effects using specified significance criteria. Mitigation measures are identified to reduce impacts to a level that is less than significant.
- **Significant and unavoidable** impacts are significant adverse impacts that cannot be avoided or mitigated to a less than significant level. This designation can be given to impacts for which there is no feasible mitigation or to impacts for which mitigation measures can be applied but are not sufficient to reduce impacts to a level that is less than significant.

4.0.3 IMPACT AND MITIGATION FORMAT

The standard format used to present the evaluation of impacts is as follows:

Impact 4.0.1 The impact number identifies the section of the report and the sequential order of the impact within that section. Following the impact number is the impact statement, which identifies the potential impact.

The identified impact is then discussed in more detail. At the end of the discussion, a level of significance is assigned to the impact. If the impact is identified as **less than significant**, there will be no further evaluation of the impact. If the impact is identified as **potentially significant** or **significant**, proposed mitigation measures will follow. **Significant and unavoidable** impacts may or may not have proposed mitigation measures.

In some cases, following the impact discussion, reference is made to state and federal regulations and agency policies that would fully or partially mitigate the impact. Also, policies and programs from applicable local land use plans that partially or fully mitigate the impact may be cited.

Mitigation measures are described in the format presented below.

Mitigation Measures

MM 4.0.1a Mitigation is identified that would reduce the impact to the lowest degree possible. The mitigation number links the mitigation to the impact; the letter identifies the sequential order of the mitigation for that impact.

4.0 INTRODUCTION TO THE ENVIRONMENTAL IMPACT ANALYSIS

<i>Timing/Implementation:</i>	<i>Gives the time when the mitigation measure is to be implemented (e.g., upon submission of final map, prior to issuance of building permit)</i>
<i>Enforcement/Monitoring:</i>	<i>Identifies the department or agency with the responsibility for implementing the mitigation measure</i>

The discussion concludes by describing how the mitigation measures presented above will reduce the impact. It then identifies the resulting level of significance of the impact following mitigation.

4.1 LAND USE

This section of the DEIR analyzes the project's consistency with the City's adopted planning and zoning regulations.

4.1.1 EXISTING SETTING

The project site is vacant with very few improvements. There are several dirt roads on the property and a perimeter fence around most of the site. The property also contains a number of off-premise/billboard signs oriented toward Interstate 5 (I-5), as well as trash and debris. Existing vegetation comprises both native and introduced species, including valley oak, gray pine, manzanita, and native and introduced grasses. The site is undeveloped with the exception of vehicle tracks and foot trails. Seasonal wetlands occur throughout the project site. Existing site topography generally consists of relatively flat areas adjacent to I-5, with rolling hills and drainages toward the southern and western edges of the property.

SURROUNDING USES

Parcels located immediately north and northwest of the project site are designated for mixed use and commercial development and are largely undeveloped. Low-density residential development exists beyond these properties approximately 0.24 miles north of the project site. I-5 borders the project site to the east. A variety of commercial and residential uses, including a mobile home park, are located beyond the freeway and are generally developed at very low densities. Land to the west and south of the project site is developed with homes at very low and low densities. Properties farther south, toward Shasta Dam Boulevard, are developed with commercial uses and the Grand Oaks Elementary School.

CITY OF SHASTA LAKE GENERAL PLAN LAND USE DESIGNATIONS

The City of Shasta Lake General Plan land use designations on and around the project site include Mixed Use, Suburban Residential, and Urban Residential High. The two residential categories include a maximum density as described below.

Mixed Use (MU) – Provides for residential, commercial, industrial, and recreation uses integrated in a master planned designed fashion with a full complement of services, facilities, and utilities. Applied primarily to vacant lands in excess of 200 acres held under single ownership.

Suburban Residential (SR) – Provides urban services, but is characterized by lower population densities. Maximum density: 3 units per acre.

Urban Residential High (URH) – Provides high-density living and office commercial environments, or a combination thereof, receiving a full range of urban services. Maximum density: 20 units per acre.

CITY OF SHASTA LAKE ZONING DESIGNATIONS

The City of Shasta Lake Zoning Code provides for Planned Development zoning. The purpose of Planned Development (PD) zoning is to provide for developments that, due to a mix of building types, land uses, or residential lot sizes, do not fit within the parameters of standard zone districts. Planned Development zone districts are under unified control, comprehensively planned, and can provide a mix of uses that could otherwise create land use conflicts. Planned Development zone districts often provide common areas and other amenities not normally found in standard types of development. This zoning district is consistent with all General Plan land use designations

4.1 LAND USE

that provide for substantial residential, commercial, or industrial development, as long as the proposed uses are consistent with the General Plan designation(s) within which the project is located.

4.1.2 REGULATORY FRAMEWORK

LOCAL

City of Shasta Lake General Plan

The City of Shasta Lake General Plan provides goals and policies related to land uses. Table 4.1-1 analyzes the project's consistency with the relevant policies. While this Draft EIR analyzes the project's consistency with the General Plan pursuant to California Environmental Quality Act (CEQA) Section 15125(d), it is the City of Shasta Lake Planning Commission and/or City Council that will make the determination of the project's consistency with the identified General Plan policies.

**TABLE 4.1-1
PROJECT CONSISTENCY WITH CITY OF SHASTA LAKE
GENERAL PLAN: LAND USE**

General Plan Goals & Policies	Consistent with General Plan?	Analysis
LU-2 Guide development in a pattern that will provide opportunities for present and future City residents to enjoy the variety of living environments, which currently exist within the City, which are served by the full range of urban services.	Yes	The Area Plan provides for a variety of housing types, including attached and detached single-family dwellings and apartments. Housing types are connected via trails to commercial and open space uses. A mixed commercial use forms the focus of the plan.
LU-3 Guide development in a pattern that will minimize land use conflicts between adjacent land users.	Yes	Adjacent land uses to the west are residential and similar to those of the plan, and thus no conflicts among adjacent land uses are anticipated.
LU-8 To establish a sense of community "village" quality and character throughout the City.	Yes	The design theme for the site is included in the plan, which creates an integrated series of villages. Implementation of the Area Plan as proposed will advance this goal.
LU-x Prior to any approval of any entitlements, Area Plans shall be developed for those vacant lands referenced as the Peri Property... Costs shall be borne by the property owner/developer.	Yes	The proposed project includes an Area Plan, a Planned Development rezone, and a Tentative Subdivision Map.
LU-(3) Ensure that the Zoning Ordinance provides for: • Minimum and maximum densities consistent with the Plan's land use classifications. (In order to promote compact development, and ensure the availability of adequate sites in transit-accessible corridors for high-density housing and development of the proposed neighborhood centers, sites designated for Urban Residential High residential uses should be reserved for the intended use).	Yes	The proposed PD rezone establishes densities, and the plan establishes minimum densities for each area on the land use diagram. Zero lot line, attached, and nontraditional housing types are included in the Area Plan and provided for in the PD zone.

General Plan Goals & Policies	Consistent with General Plan?	Analysis
Developing standards that permit zero-lot line attached or detached single-family dwellings on sites designated for Urban Residential and Urban Residential High densities in the General Plan.		
LU-(11) Prepare Area Plans for those areas identified in Policies LU-w and LU-x that will specifically address the following in a narrative and diagram form: - Master Development Plan - The services and facilities necessary to serve the identified area based on ultimate development. Services and facilities include, but are not limited to roads, water, sewer, storm drainage, power, law enforcement, fire protection, schools, parks and trail system. - Construction, maintenance and operation costs. - Financing mechanisms to provide the necessary services and facilities. - Maintenance finance mechanisms. - A fiscal impact analysis of public services and facilities over a 20-year time period. - A schedule of the phasing of public improvements and anticipated development. - Preliminary grading and tree removal and replacement. - The design and character of development must be identified including, but not limited to parcel sizes, building types, general architecture, scale, landscaping and amenities. - Compatibility with adjacent land uses.	Yes	The Area Plan includes: - A Master Development plan and development standards implemented by the PD zone district. - A public services plan for all services within the Plan Area. - A financial plan estimating costs of the project to the City. - A recommendation for a community financing district (CFD) to ensure proper maintenance of services and facilities. - A fiscal impact analysis showing potential revenue/expenditure for 20 years. - A phasing plan for both development and infrastructure. - A preliminary grading plan and tree removal plan. - Design guidelines. - Residential uses consistent with the adjacent existing residential land uses.

In addition to the policies, the General Plan Land Use Element also states:

Mixed Use: Provides for residential, commercial, industrial and recreation uses integrated in a master planned designed fashion with a full complement of services, facilities and utilities. Applies primarily to vacant lands in excess of 200 acres held under single ownership.

City of Shasta Lake Zoning Regulations

Chapter 17.62.010, Planned Development (PD) District, in the City of Shasta Lake Municipal Code states the following purpose for a planned development:

The purpose of the Planned Development (PD) district is to provide for developments that, because of a mix of building types, land uses or residential lot sizes, do not fit within the parameter of standard zone districts. Planned developments are under

4.1 LAND USE

unified control, comprehensively planned and can provide a mix of uses that could otherwise create land use conflicts. Planned developments often provide common areas and other amenities not normally found in standard types of development. This district is consistent with all General Plan designations that provide for substantial residential, commercial or industrial development, provided the proposed uses are consistent with the General Plan designation(s) within which the project is located. (Ord. 97-99 §1 part)

Per Chapter 17.62.030, Planned Development (PD) District, in the City of Shasta Lake Municipal Code:

If a proposed residential project is located in an area designated by the General Plan as Urban Residential (UR) or Suburban Residential (SR), and meets the Planned Development concept described in the General Plan, including a mix of housing types, up to a twenty-five (25) percent residential density bonus over that permitted by the General Plan designation(s) may be permitted. [Ord. 97-99 §1(part)]

4.1.3 IMPACTS AND MITIGATION MEASURES

STANDARDS OF SIGNIFICANCE

An impact would be considered significant under the following circumstances:

- 1) If buildout of the proposed project could physically divide, or provide an isolated portion of, the City of Shasta Lake.
- 2) If the project would conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project (including, but not limited to, the General Plan, specific plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect.
- 3) If the project would conflict with any applicable habitat conservation plan or natural community conservation plan.
- 4) If division of the property would conflict with the proposed Area Plan or PD zoning for the site.

METHODOLOGY

Evaluation of potential land use impacts of the proposed Mountain Gate at Shasta Area Plan project was based on review of planning documents pertaining to the Area Plan and the Planned Development Ordinance, including the City of Shasta Lake General Plan and Zoning Code, consultation with appropriate agencies, and field review of the project site and surroundings.

IMPACTS AND MITIGATION MEASURES

Division of the City and/or Isolation of Any Portion of the City (Standard of Significance 1)

Impact 4.1.1 Buildout of the proposed project could physically divide, or provide an isolated portion of, the City of Shasta Lake. This is considered to be a **less than significant** impact.

The proposed project would extend the city along the I-5 corridor north of the main developed portions of the community. As the General Plan designates a mixed-use development pattern on the project site and on lands west of the site to the Union Pacific Railroad, the City has planned for growth in this area for some time (see **Figure 3.0-3**). Eventually, as development occurs in other areas of the Area Plan, this project will form a part of a much larger development area north of Shasta Dam Boulevard and west of I-5.

Phasing of the project, as shown in **Figure 3.0-6**, is planned to start at the north end of the project site and proceed south. The utilities, and a roadway that will form the primary access through the site, would be constructed as part of the first phase. While a roadway would connect from the Mountain Gate Interchange to the southerly boundary of the site with a connection to Cascade Boulevard as part of Phase 1 of the project, the initial roadway may not include full roadway improvements (e.g., pavement width, sidewalks, landscaped medians) until future phases of development. This will be reviewed and considered with each subsequent tentative subdivision map or land use proposal.

Initially, the development at the north end of the property may appear as if it is more a part of the community of Mountain Gate than of the City of Shasta Lake. Although vehicular access to the city from within the boundaries of the project site will be provided, the main access to this phase of the development will be from the Mountain Gate interchange with I-5, further reinforcing the visual separation between the first phase of the new development and the existing city. While development of a roadway connection to the city to the south, and a pedestrian/bicycle connection to Black Canyon Road, would help develop a sense of connection with the existing city in Phase 1, the bulk of the development will still appear disconnected from the city. This is considered a temporary situation that will diminish substantially as the other phases are completed, and the impact is considered **less than significant**.

The topography of the project site, with rolling hills and drainages along the western boundary, limits the potential to provide road connections to the existing road network. Existing residential development and parcelization of the land west of the site further restrict the connection potential. The eventual extension of the primary roadway south to Shasta Dam Boulevard, and the development of commercial uses at the intersection of Shasta Way and Shasta Dam Boulevard, may encourage some of the residents to seek goods and services in the city and draw residents toward the developed portions of the city. There is a potential that if grocery and similar retail commercial uses are developed in areas A or H of the Area Plan, residents of the project could shop there, leading to the appearance of an isolated portion of the community and discouraging connectivity to the existing commercial and city core. As shown in **Table 3.0-6** of Section 3.0, Project Description, the proposed Area Plan establishes grocery uses as allowable in areas A and H with either a Zoning / Site Development, Administrative or Use Permit, allowing the City to evaluate the use in the context of other development in the area if a grocery use is proposed.

There is no guarantee that residents of the new development will walk or drive into the existing city and shop there. However, by providing this ability through roadway and trail connectivity,

4.1 LAND USE

and by encouraging commercial uses nearer to town that will be used on a regular basis, the design of the project is intended to foster community and connectivity. This impact is considered **less than significant**.

Mitigation Measures

None required.

Conflict with Applicable City of Shasta Lake Land Use Plans, Policies, or Regulations Adopted to Avoid/Mitigate an Environmental Effect (Standard of Significance 2)

Impact 4.1.2 The proposed project has the potential to conflict with policies in the City General Plan adopted for the purpose of avoiding or mitigating an environmental effect. This impact is considered to be **less than significant**.

The City has several policies and ordinances that are designed to minimize impacts on the environment. Among these are the tree conservation ordinance (see Section 4.6, Biological Resources) and the hillside development ordinance (see Section 4.8, Geology and Soils). The City's General Plan includes numerous policies that address noise, air quality, recreation, and public service impacts with the intent to reduce or eliminate the potential for growth impacts. The Area Plan also includes policies intended to apply specifically to the proposed project. The design of the proposed project is intended to avoid many of the biologically significant features on the site. By placing the development on the ridgeline and out of identified wetland areas, the drainages and most of the wetland areas are preserved. Large wetland areas are incorporated into the open space areas of the site and are linked by trails. The Area Plan also provides for clustering of housing units and nontraditional housing design, including alley-access and green-court styles, which enable development to make efficient use of the available land while preserving sensitive areas.

Development envisioned by the plan provides for a mix of housing types and densities, which allows subsequent development to avoid natural features, yet keeps the density reasonable. The Area Plan provides for both conventional commercial and mixed commercial uses surrounded by higher-density residential and linked via trails to the remainder of the Area Plan. Open space and hillsides are preserved consistent with the City's hillside development ordinance (see Section 4.8, Geology and Soils).

The CEQA Guidelines require an EIR to "discuss" any potential inconsistencies with applicable plans, but they do not explicitly require that an EIR reach a conclusion on whether a conflict exists (see CEQA Guidelines Section 15125[d]). Because the policy language found in any local agency's general plan and other applicable land use plans is susceptible to varying interpretations, it is often difficult to determine, in the context of an EIR, whether a proposed project is consistent or inconsistent with applicable plan policies. The analysis of General Plan consistency serves to present decision-makers and the public with information and background regarding the relationship of the proposed project to applicable land use plans, in this case the City of Shasta Lake General Plan. It is recognized that not every General Plan policy is applicable to or affected by implementation of the proposed project. For this reason, the analysis below is limited to those General Plan policies that govern or inform development of the proposed land uses at the project site.

Case law interpreting planning and zoning law (Government Code Section 65000 et seq.) makes it clear (i) that the meaning of land use plan policies is to be determined by the city council, as opposed to city staff, EIR consultants, applicants, or members of the public, and (ii) that the city

council's interpretations of applicable plan policies will prevail if they are "reasonable," even though other reasonable interpretations are also possible (see *No Oil, Inc. v. City of Los Angeles* (1987) 196 Cal.App.3d 223, 245–246, 249). Consistency does not require full compliance with all plan policies. Courts have recognized that a general plan must try to accommodate a wide range of competing interests—including those of developers, neighboring homeowners, prospective homebuyers, environmentalists, current and prospective business owners, jobseekers, taxpayers, and providers and recipients of all types of municipal services—and to present a clear and comprehensive set of principles to guide development decisions. Once a general plan is in place, it is the province of elected officials to examine the specifics of a proposed project to determine whether it would be "in harmony" with the policies stated in the plan (see *Sequoyah Hills Homeowners Association v. City of Oakland* (1993) 23 Cal.App.4th 704, 719).

Courts have further recognized that, because general plans often contain numerous policies emphasizing differing and at times contrasting legislative goals, a development project may be "consistent" with a general plan, taken as a whole, even though the project appears to be inconsistent or arguably inconsistent with some individual policies (see *Sequoyah Hills Homeowners Association*, supra). Furthermore, courts strive to "reconcile" or "harmonize" seemingly disparate general plan policies (see *No Oil*, supra, 196 Cal.App.3d at p. 244).

An inconsistency between a proposed project and an applicable plan is a legal determination, not a physical impact on the environment. However, to the extent to which physical effects could occur with development of the proposed project, as facilitated by the proposed Area Plan, those effects are addressed throughout the DEIR.

Table 4.1-1 lists the policies and implementation measures in the Land Use Element of the City's General Plan that apply to the proposed project. As shown in the table, the Area Plan is consistent with the General Plan and meets the requirements of the City's General Plan for this property.

As proposed, the Area Plan is consistent with the policies of the City of Shasta Lake General Plan regarding development requirements for this property, identified in the General Plan as the Peri Property. The Area Plan provides for a mix of housing densities and allows for mixed-use commercial-residential potential. Open space and recreational amenities are integrated into the project design, as is the avoidance of many of the biological features on the site. As such, this impact is considered **less than significant**.

Mitigation Measures

None required.

Conflict with an Applicable Habitat Conservation Plan or Natural Community Conservation Plan (Standard of Significance 3)

Impact 4.1.3 The project would not conflict with an applicable habitat conservation plan or natural community conservation plan. There is **no impact**.

Section 4.6, Biological Resources, of this DEIR evaluates the biological impacts associated with the proposed projects. There are no habitat conservation plans (HCP) or natural community conservation plans (NCCPs) within the City of Shasta Lake or Shasta County. As such, the proposed project cannot conflict with these plan types. The project does require the fill of some wetlands; the extent of fill and mitigation is evaluated and fully described in Section 4.6 of this Draft EIR.

4.1 LAND USE

Mitigation Measures

None required.

Conflict with the Proposed Area Plan and/or Zone Designation Resulting from the Division of Property (Standard of Significance 4)

Impact 4.1.4 The division of the property would not conflict with the Area Plan or zoning for the site. There is **no impact**.

Future development under the proposed project would establish land uses and development standards consistent with the Area Plan. The intent of the PD zoning district is to provide flexibility in development to encourage a more compact urban design and increased densities. The PD zoning allows any use or combination of uses that are arranged and designed in such a manner so as to result in a development that is internally compatible, compatible with surrounding uses, and consistent with the General Plan to be permitted outright in the PD district (see **Appendix 3.0-2**).

The proposed subdivision would create 21 parcels and establish the primary roadway network for the project. The proposed parcels divide the property consistent with the development areas proposed in the schematic land plan (see **Figure 3.0-3**). The proposed parcels are considered an interim phase of the project, as the parcels created by the Tentative Subdivision Map are intended for future subdivision prior to development. The large-lot parcels, ranging in size from 4.5 to 181.5 acres, will be further subdivided consistent with the proposed Area Plan and PD district. To ensure consistency, the City requires that the Area Plan and Planned Development zone be adopted before the filing of any final map.

The City has a Grading, Erosion Control and Hillside Development ordinance that will apply to development within the proposed project. The topography of the site varies, with site grades ranging from approximately 800 to 950 feet (mean sea level) in elevation. Terrain consists of mountain meadowland, surrounded by steep hill terrain to the north, west, and across I-5 to the east. Three-quarters of the property slopes gently from north to south with little topographic relief (see **Figure 4.8-1** in Section 4.8). The southern quarter of the property, as well as small portions of the western boundary, has steep-dipping hills with up to 150 feet of relief. A total of 17.6 acres of the project site has slopes in excess of 30 percent. For the most part, slopes over 30 percent are contained in low-density residential and open spaces. Therefore, the project site is not significantly affected by slope. Other topographic features of the site that will limit development of the parcels are discussed throughout this Draft EIR.

The proposed Area Plan and accompanying PD zone district are consistent with the City's General Plan policies established for development of this property. There is **no impact** to land use.

Mitigation Measures

None required.

4.1.4 CUMULATIVE SETTING, IMPACTS, AND MITIGATION MEASURES

CUMULATIVE SETTING

The cumulative setting includes all existing, approved, proposed, and reasonably foreseeable development in southern Shasta County surrounding the I-5 corridor from Shasta Lake City south to the county line. The majority of lands along the I-5 corridor are designated for urban uses by the Cities of Redding and Anderson, but there are also unincorporated lands in Shasta County primarily in use for agricultural purposes or suburban residential.

Cumulative Development

Impact 4.1.5 The project would introduce growth into an area that is currently undeveloped and could encourage growth on lands outside of the city. This impact is **less than cumulatively considerable**.

The proposed project will provide for development in an area of the city that is currently vacant. The land has been designated for development since adoption of the City's General Plan. The City has anticipated that the proposed project site will be developed with a mix of uses and implemented with an Area Plan. Properties to the west are developed with lower-density single-family residential uses; however, topography to the west limits the ability of adjacent land to develop at an increased density. Extension of utilities, in particular water, could aid in the future development of this area. Because the City knows of no development plans for the area to the west and this area would itself require environmental analysis, and since the proposed project, including the extension of utilities, is consistent with the expectations of the City's General Plan, this impact is considered **less than cumulatively considerable**.

Development of the proposed project site will extend utilities to the Mountain Gate interchange to the north, which could allow property just outside of the city limits to develop in the future. The most likely development type at this location would be commercial and oriented toward Interstate 5. The City's General Plan recognizes this area as Commercial, and there is an existing gasoline station northwest of the Mountain Gate interchange. Because the potential uses are consistent with the City's plan for uses in this area, this impact is considered **less than cumulatively considerable**. It should be noted approval by the Local Agency Formation Commission (LAFCO) and Bureau of Reclamation would be required in order to provide utility services outside the city limits.

Development to the east is constrained by I-5. The project could encourage development to the south, along the extension of the main roadway and in particular along Cascade Boulevard and Shasta Dam Boulevard. The City's General Plan and zoning also support commercial growth along Shasta Dam Boulevard. Therefore, this impact is considered **less than cumulatively considerable** and could be regarded as a positive influence, inasmuch as it could contribute to economic revitalization efforts.

While the proposed project may encourage development of adjacent lands, a stronger influence on future development of these lands is the fact that they are designated for development in the City's General Plan. If and when future development proposals are brought forward to the City, such plans will be subject to their own environmental review during the entitlement process. It would be speculative to characterize specific developments that could occur on adjacent lands or the timing of such development. The proposed project is consistent with the General Plan, and the future development possibly encouraged by the project would

4.1 LAND USE

be evaluated for consistency with the City's General Plan prior to approval. This impact is considered **less than cumulatively considerable**.

Mitigation Measures

None required.

REFERENCES

- City of Shasta Lake. 1998. *City of Shasta Lake Municipal Code; Chapter 17.62 Planned Development District*.
- . 1999. *City of Shasta Lake General Plan Land Use and Circulation Map and the Land Use Policies*. Revised June 15, 1999.

4.2 POPULATION/HOUSING/EMPLOYMENT

4.2 POPULATION/HOUSING/EMPLOYMENT

This section describes existing conditions in the project area with respect to population, housing, and employment and evaluates potential impacts that could occur with implementation of the Mountain Gate at Shasta Area Plan.

4.2.1 EXISTING SETTING

REGIONAL SETTING

The City of Shasta Lake is the northernmost incorporated community in Shasta County. Situated along the Interstate 5 (I-5) corridor, the city is located south of Shasta Dam/Lake Shasta and north of the City of Redding. Being the county seat, Redding is the largest of the three cities in the county and the primary economic driver in the region. Approximately 13.5 miles farther south along the I-5 corridor is the City of Anderson, a city that is similar in size to the City of Shasta Lake. As shown in **Table 4.2-1**, these three cities comprise approximately 62 percent of the total county population.

TABLE 4.2-1
SHASTA COUNTY POPULATION, 2013

Shasta County	Population	Percentage of County Total
Anderson	10,267	5.75
Redding	90,670	50.77
Shasta Lake	10,100	5.65
Balance of County	67,564	37.83
Incorporated	111,037	62.17
County Total	178,601	100.00

Source: DOF 2013a

I-5 serves as the primary transportation corridor in the county, connecting the residents of Shasta Lake with these other communities, as well as with the majority of jobs and services in the region.

POPULATION GROWTH TRENDS

There are several methods of projecting population growth for small communities. Most of the methods rely on an analysis of historic population levels and an educated guess as to the future growth potential of the community. The guess is an educated one because it is based on availability of vacant land, knowledge of building permit activity, and an understanding of the region within which the community is located. In addition to estimating the degree to which population growth will occur, it is also important to understand where this growth will likely take place in order to plan for essential services.

The California Department of Finance (DOF) estimates population each year based on the number of building permits issued, residential units destroyed, requests for new electrical connections, etc. These estimates are published in May of each year in a spreadsheet known as the E-5 City/County Population and Housing Estimates and are validated against the US Census every ten years.

4.2 POPULATION/HOUSING/EMPLOYMENT

Upon the city's incorporation on July 2, 1993, the DOF extrapolated data from the 1990 Census and calculated the city's population at 8,783. The 2000 US Census determined that the population of the city was 9,008 in April 2000.

According to Census data, between 1990 and 2000, the population increased by 2.21 percent, or an average annual growth rate of 0.22 percent. During this same period, Shasta County as a whole grew by 11 percent. **Table 4.2-2** shows population data for the city between 2004 and 2013.

The population numbers shown in **Table 4.2-2** reflect positive annual growth until the beginning of 2008, due in part to the rising cost of development in Redding and the strong housing market affecting much of the nation. This was followed by a negative annual average growth rate of approximately 0.23 percent from 2008 to 2013. This negative annual growth rate is roughly equivalent to that experienced by Shasta County as a whole during the same period (0.27 percent).

TABLE 4.2-2
CITY OF SHASTA LAKE HISTORIC POPULATION GROWTH,
2004–2013

Year	Population	Population Change (Persons)	Population Percentage Change
2004	10,038	163	1.62
2005	10,180	142	1.39
2006	10,195	15	0.15
2007	10,237	42	0.41
2008	10,243	6	0.06
2009	10,269	26	0.25
2010	10,164	-105	-1.03
2011	10,102	-62	-0.61
2012	10,077	-25	-0.25
2013	10,100	23	0.23
Totals		225	2.22

Source: City of Shasta Lake 2010; DOF 2013a

Areas of the city that have experienced and will continue to experience the most growth are located adjacent to those transportation corridors leading to I-5. This is because many residents of the city commute to employment centers that are, at least for now, predominantly located in and around the city of Redding. The recent subdivisions south of Pine Grove Avenue and the proposed project reflect the desire to be situated near these transportation corridors.

The Shasta Lake General Plan projects population of the city at buildout (2050) based on an average growth rate of 1.58 percent. The most current population projections from the DOF indicate that the State anticipates Shasta County will experience an annual average growth

rate of approximately 0.95 percent between 2010 and 2050, with a total estimated population of 259,167 by the year 2050 (see **Table 4.2-3**).

The recent decline in population as shown in **Table 4.2-2** is directly related to the economic downturn of 2008, and the economy now shows signs of improving. Based on trends over the past ten years and recent economic indications, a slow to moderate growth rate of 0.5–1 percent is estimated for the city over the next ten years. If this proves correct, and assuming the current occupancy rate of 2.58 persons per household continues, the city can expect to add up to 1,055 housing units over the next ten years, including both single-family and multi-family units (see **Table 4.2-4**).

All things being equal, the city would also be expected to gain commercial and industrial development over the same period. The problem with estimates of nonresidential growth is that they rely on a variety of factors which are outside a simple population model. These include market demand, interest rates, local competition, growth of existing industry, development of new sites, etc. These factors are not easy to model on smaller scales such as the City of Shasta Lake.

TABLE 4.2-3
SHASTA COUNTY POPULATION PROJECTIONS, 2010–2050

Year	Population	Annual Percentage Change
2010	177,472	--
2020	199,814	1.2
2030	220,019	0.96
2040	242,016	0.96
2050	259,167	0.69

Source: DOF 2013b

4.2 POPULATION/HOUSING/EMPLOYMENT

TABLE 4.2-4
CITY OF SHASTA LAKE POPULATION PROJECTIONS, 2014–2023

Year	Growth Rate 0.50%			Growth Rate 0.75%			Growth Rate 1.00%		
	Population	Change	HU	Population	Change	HU	Population	Change	HU
2013	10,100			10,100			10,100		
2014	10,151	51	20	10,176	76	29	10,201	101	39
2015	10,201	51	20	10,252	76	30	10,303	102	40
2016	10,252	51	20	10,329	77	30	10,406	103	40
2017	10,304	51	20	10,406	77	30	10,510	104	40
2018	10,355	52	20	10,484	78	30	10,615	105	41
2019	10,407	52	20	10,563	79	30	10,721	106	41
2020	10,459	52	20	10,642	79	31	10,829	107	42
2021	10,511	52	20	10,722	80	31	10,937	108	42
2022	10,564	53	20	10,803	80	31	11,046	109	42
2023	10,617	53	20	10,884	81	31	11,157	110	43
Totals		518	200		783	303		1,055	410

Source: City of Shasta Lake

HU = housing unit

HOUSING CHARACTERISTICS

Housing

As stated in the Shasta Lake General Plan Housing Element for the planning period 2009–2014, the city has a variety of housing types and tenure to suit all income levels. The primary housing unit in Shasta Lake in 2010, when the current Housing Element was prepared, was single-family in nature and owner-occupied. This remains true for the year 2013, as shown in **Table 4.2-5**.

TABLE 4.2-5
OCCUPIED HOUSING UNITS, 2010–2013

Housing Type	City of Shasta Lake		Shasta County	
	2010	2013	2010	2013
Single-Family	3,355	3,290	55,624	56,389
Multi-Family	325	321	12,271	12,568
Mobile Homes	552	567	8,682	8,896
Boat, RV, Van, etc.	30	–	205	–
Total	4,262	4,178	76,782	77,853
Owner-Occupied	2,787	–	45,277	–
Renter-Occupied	956	–	25,069	–

Source: US Census Bureau 2010; DOF 2013a

Table 4.2-6 shows an increase in the number of housing units in the City of Shasta Lake and Shasta County between 1990 and 2010. Housing units increased by 10 percent between 1990 and 2000 in the city and by 8.2 percent in the county as a whole. Between 2000 and 2010, the number of housing units increased by 19.2 percent in the City of Shasta Lake and by 26.8 percent in Shasta County.

TABLE 4.2-6
HOUSING UNITS, 1990–2010

Year	City of Shasta Lake	Change	Shasta County	Change
1990	3,234	–	55,966	–
2000	3,577	10.0%	60,552	8.2%
2010	4,262	19.2%	76,782	26.8%

Source: US Census Bureau, 1990, 2000, 2010

Employment

According to the Shasta Lake Housing Element, employment trends for the working segments of the population have been favorable for both Shasta County and the City of Shasta Lake. The city is adjacent to the larger population and employment center of Redding. According to the California Employment Development Department (EDD), Labor Market Information Division, the 2012 annual average employment/unemployment rates for Shasta County and the City of Shasta Lake were as shown in **Table 4.2-7**.

TABLE 4.2-7
LABOR FORCE DATA – 2012 ANNUAL AVERAGE

Area	Labor Force	Employment	Unemployment Number	Unemployment Rate
Shasta County	81,200	70,400	10,900	13.4%
Anderson	4,400	3,700	700	16.6%
Redding	40,700	35,900	4,800	11.7%
Shasta Lake	4,400	3,600	800	18.1%

Source: EDD 2012

The unemployment rate for Shasta County was 10.9 percent in July 2013, below the estimated 13.4 percent from the previous year. The unemployment rate for the City of Shasta Lake was 14.8 percent in July 2013, down from the 2012 annual average of 18.1 percent. According to the US Census Bureau, the median household income for the City of Shasta Lake is \$42,901, 69 percent of the state average of \$61,632.

Table 4.2-8 provides information on employment by occupation in Shasta County and the City of Shasta Lake.

4.2 POPULATION/HOUSING/EMPLOYMENT

According to the US Census Bureau, most people employed in Shasta County in 2010 were employed in educational, health, and social services, followed by retail trade and arts, entertainment, recreation, accommodation, and food service occupations. The city's top three employers were educational, health, and social services; retail trade; and construction.

**TABLE 4.2-8
OCCUPATIONS IN 2010**

Employment	City of Shasta Lake	Shasta County
Agriculture, forestry, fishing and hunting, mining	45	1,924
Construction	432	5,606
Manufacturing	262	3,967
Wholesale trade	112	1,528
Retail trade	488	9,532
Transportation and warehousing, utilities	214	3,176
Information	39	1,366
Finance, insurance, real estate	262	4,344
Professional, scientific, management, administrative and waste management services	331	6,541
Educational, health and social services	888	17,804
Arts, entertainment, recreation, accommodation and food services	356	6,089
Other services except public administration	185	3,638
Public administration	226	3,905

Source: US Census Bureau 2010

There are also several vacant commercially zoned parcels along Cascade Boulevard and Shasta Dam Boulevard, which will ultimately be developed, creating additional jobs within walking and bicycling distance of the project site. **Table 4.2-9** indicates the companies in the city with the highest number of jobs based on telephone interviews conducted by the City in November 2013.

**TABLE 4.2-9
TOP EMPLOYERS IN THE CITY OF SHASTA LAKE, NOVEMBER 2013**

Employer	Number of Employees
Gateway Unified School District	220
Sierra Pacific	138
Knauf Insulation	123
City of Shasta Lake	49
McDonald's	44
Fresenius Medical Care	42
Farmers Market Place	32
Premiere Brand Meats	27
Rite Aid	22
Lawrence & Associates	18
Total	715

Employment Generation within the Project Boundaries

The Traffic Impact Analysis (see Section 4.3, Transportation and Circulation), based on information obtained from the Shasta Regional Transportation Agency, assumes 2.0 employees per thousand square feet of retail sales space and 3.3 employees per thousand square feet of office space. The Traffic Impact Analysis also assumes that approximately 15,000 square feet of the commercial area may be ultimately considered office space, with 180,584 square feet of retail space. The Traffic Impact Analysis also projects an additional 40 employees for community and neighborhood parks and maintenance of public landscaped areas. With these assumptions, approximately 450 jobs could be anticipated within the project site at buildout of the project.

Jobs-Housing Balance

As stated in Section 5.0, Alternatives, the jobs-housing balance is a ratio between a measure of employment and a measure of housing in a given area. There are different methods for calculating a jobs-housing ratio, with the most basic being the ratio of the number of jobs to the number of housing units in an area. A ratio of 1.0 indicates a balance. A ratio less than 1.0 indicates residents are traveling out of the area for work; a ratio greater than 1.0 indicates people are coming from out of the area to work.

The DOF estimates the number of housing units in Shasta County at 70,846 (adjusted for vacancy rate) as of January 1, 2013. According to the EDD, 72,200 Shasta County residents were employed in August 2013. This reflects a jobs-housing balance of 1.02.

The DOF estimates the number of housing units in Shasta Lake at 3,915 (adjusted for vacancy rate) as of January 1, 2013. According to the EDD, 3,700 Shasta Lake residents were employed in August 2013. This reflects a jobs-housing balance of 0.95.

4.2 POPULATION/HOUSING/EMPLOYMENT

Whereas it is not known how many of the jobs in the City of Shasta Lake are held by residents of the city, the 2010 US Census reports that the average commute time for city residents is 19.2 minutes, which would allow a commute almost anywhere in the northern portion of Shasta County.

Based on a total of 1,604 dwelling units, the jobs-housing ratio within the project boundaries would be approximately 0.28–0.32, depending on the number of live-work units in the development. However, there is no means of ensuring the residents within the project boundaries will opt to work within the project site or that the jobs provided near the housing will be granted to local residents.

In addition to jobs within the project boundaries, several vacant commercial sites within the city will be ultimately developed, creating additional jobs in the community. For example, directly south of the subject property is an approximately 9.5-acre site proposed for future commercial development. A recent development proposal included approximately 135,000 square feet of general commercial uses. Using the same projection assumptions as above, approximately 270 jobs would be created for that project alone. This site is within walking distance of the Mountain Gate at Shasta site.

4.2.2 REGULATORY FRAMEWORK

LOCAL

City of Shasta Lake General Plan

The City of Shasta Lake General Plan provides long-term guidance and policies for maintaining and improving the quality of life of the community and natural resources within the community. The General Plan provides direction for the city's growth and development and serves as a guide for the adoption of regulations necessary to implement the goals, policies, and implementation measures. While this Draft EIR analyzes the project's consistency with the General Plan pursuant to California Environmental Quality Act (CEQA) Section 15125(d), it is the City of Shasta Lake Planning Commission and/or City Council that will make the determination of the project's consistency with the identified General Plan policies.

TABLE 4.2-10
PROJECT CONSISTENCY WITH CITY OF SHASTA LAKE
GENERAL PLAN: HOUSING

General Plan Goals & Policies	Consistent with General Plan?	Analysis
Goal HE-1 Provide adequate land for a balanced range of housing.	Yes	The Mountain Gate at Shasta project provides a wide range of densities for residential development. Densities include Very Low (1–2 units per acre), Low (2–4 units per acre), Medium (4–6 units per acre), and High (20–30 units per acre).
Policy H-P-6 The City shall strive to ensure that affordable units are located in suitable locations throughout the city close to retail services, parks, schools, public facilities, and public	Yes	A 4.5-acre parcel designated for high-density housing (20–30 units per acre) at the southerly boundary of the site is located adjacent to Grand Oaks Elementary school and within walking

4.2 POPULATION/HOUSING/EMPLOYMENT

General Plan Goals & Policies	Consistent with General Plan?	Analysis
transit, and other amenities.		distance of a future commercial center development. A new community park is included in the proposed development, also within walking distance of this parcel. The site is located along a major residential collector, which will include public transit stops. Additional properties within the project boundaries are also designated for higher-density residential development in residential-commercial mixed-use areas, also within walking distance of the community park, neighborhood commercial uses, and transit stops.
Policy H-P-18 The City shall ensure that amenities, transit, and other essential services are provided at appropriate distances from residential development to serve the surrounding neighborhoods without the use of automobiles (pedestrian-oriented development transit-oriented development, traditional neighborhood development).	Yes	See consistency analysis for Goal HE-4 and Policy H-P-19.
Policy H-P-19 The City shall ensure that street and subdivision layout encourages connectivity and livable neighborhoods.	Yes	An internal circulation system, in the form of roads and trails, would link all of the uses in the Area Plan. The system has been designed to encourage walking, biking, and other non-motorized uses. The trails would be located along biologically important areas, such as drainages and wetlands, as well as at the base of slopes. The proposed trails would be separated from roadways in some areas of the project site and adjacent to roadways in others. The Area Plan contains a schematic trail plan, a typical trail design section, and policies that require trail linkages for all land uses. Policies in the Area Plan require that subsequent development connect to and extend any existing trail system.
Goal HE-3 Provide adequate services for residential development.	Yes	The developer will be required to finance and install all infrastructure required to serve development within the project boundaries. Also see consistency analysis for Policy H-P-28.
Policy H-P-28 The City shall ensure that housing developments pay their own way in terms of financing public facilities and services. For affordable housing, the City/Agency shall secure funding wherever possible for the replacement or installation of off-site infrastructure.	Yes	All developments within the project boundaries will be required to pay impact and connection fees for water, wastewater, electric, parks and recreation, and traffic. These fees are established based on Master Plans/Capital Improvement Plans and fee studies prepared by the City, which determine the cost to improve and maintain city infrastructure systems. Assessment districts or other funding mechanisms are required to provide long-term maintenance of open space areas, drainage facilities, public

4.2 POPULATION/HOUSING/EMPLOYMENT

General Plan Goals & Policies	Consistent with General Plan?	Analysis
		lighting, and landscaping improvements.
Goal HE-4 Provide a balance of employment and housing.	Yes	The project site has been identified as an appropriate location for mixed-use development. The project proposes residential units of varying densities and types, from large-lot single-family detached to townhomes and apartments. An 11.2-acre parcel at the northerly boundary of the site is designated for retail and service-commercial uses, with a potential square footage of 121,968. A 14.9-acre parcel at the northerly portion of the property is designated for high-density mixed use, with the potential for an additional 73,616 square feet of commercial uses.
Goal HE-5 Energy Efficiency	Yes	See consistency analysis under Policy H-P-30.
Policy H-P-30 The City shall enforce State requirements, including Title 24 requirements, for energy conservation in new residential projects and encourage residential developers to employ additional energy conservation measures with respect to the following: • Street and driveway design • Lot pattern and configuration • Siting of buildings • Landscaping • Solar access	Yes	The proposed project includes a Tentative Subdivision Map for 21 large lots, which will be further subdivided at a future date. Each future subdivision will include a lotting pattern, which will be analyzed to ensure consistency with Title 24 and other adopted state and City regulations related to energy efficiency.

In addition to the Housing Element goals and policies, the General Plan Land Use Element states the following in terms of Mixed Use land designations:

Mixed Use: Provides for residential, commercial, industrial and recreation uses integrated in a master planned designed fashion with a full complement of services, facilities and utilities. Applies primarily to vacant lands in excess of 200 acres held under single ownership.

4.2.3 IMPACTS AND MITIGATION MEASURES

STANDARDS OF SIGNIFICANCE

A population, housing, and employment impact is considered significant if implementation of the project would result in any of the following:

- 1) Induce substantial growth or concentration of population in an area either directly or indirectly (e.g., through projects in an undeveloped area or extension of major infrastructure) that would be inconsistent with the City of Shasta Lake General Plan.
- 2) Displace existing housing, especially affordable housing.

- 3) Displace a large number of people.

METHODOLOGY

Research was conducted on demographic and housing conditions using existing documents and other information sources. Information was obtained from governmental agencies through their websites. Among these agencies were the US Census Bureau, the California Department of Finance, and the California Employment Development Department.

For the purposes of determining population and housing impacts, a factor of 2.58 persons per household, as established by the DOF for the City of Shasta Lake in 2013, was used to determine the potential growth in population as a result of the proposed project. Growth inducement and its associated environmental effects are discussed in Section 6.0, Other Evaluations Required by CEQA, of this DEIR.

As determined in the Initial Study prepared for the proposed project, implementation of the proposed project would not result in impacts associated with the displacement of existing housing or a large number of people. Therefore, these impacts (Standards of Significance 2 and 3) will not be addressed further in this Draft EIR.

IMPACTS AND MITIGATION MEASURES

Substantial Population Growth or Concentration of Population Inconsistent with the City General Plan (Standard of Significance 1)

Impact 4.2.1 Buildout of the proposed project would result in population growth and the generation of employment. This is considered to be a **less than significant impact**.

The proposed subdivision would create 21 parcels intended for future re-division and establish the primary roadway network for the project. This action would not result in the addition of population and employment. A large-lot Tentative Subdivision Map, Area Plan, and Planned Development rezone are requested as part of the approval process. The map provides a single roadway connection between the Mountain Gate/Wonderland Boulevard interchange to the north and Cascade Boulevard to the south. The alignment of the roadway also contains the major water and sewer conduits connecting the proposed project to City utilities.

The proposed project's land use mix would result in the addition of approximately 1,604 housing units and approximately 4,138 new residents at buildout (assuming an average of 2.58 persons per household as reported by the DOF). Further, because of the proposed commercial areas, the project could generate a limited number of full-time equivalent employees, some of whom could relocate to the area from outside of the city. This would be equivalent to a 41 percent increase in the city's current population. This increase in population could also result in direct and indirect environmental effects (such as noise, public services, and traffic), which are discussed in the relevant sections of this Draft EIR.

However, the proposed project would extend the city along the I-5 corridor north of the main developed portions of the community in an area of the city that has been designated for development since adoption of the City's General Plan. The City anticipated that the proposed project site will be developed with a mix of uses and implemented with an Area Plan.

4.2 POPULATION/HOUSING/EMPLOYMENT

By directing future development in this area, the City of Shasta Lake would meet future city needs for these uses, including accommodation of population, housing, and employment needs, while avoiding the potential for “leapfrog” development through the rest of Shasta County.

Further, the project itself proposes to provide self-contained features that would reduce common population and housing impacts. The environmental impacts of population growth associated with the proposed project are addressed in the various technical sections of this Draft EIR, with mitigation measures identified as necessary. In addition, indirect effects on existing facilities that could occur as a result of the project would be dealt with through the project’s provision of commercial sites, recreational and open space facilities, roadway improvements, and new infrastructure. As such, the project’s impacts to housing and population are considered **less than significant**.

Mitigation Measures

None required.

4.2.4 CUMULATIVE SETTING, IMPACTS, AND MITIGATION MEASURES

CUMULATIVE SETTING

The City of Shasta Lake is located in the northernmost extent of California’s Central Valley. The entire 590-acre project site is located within the northern limits of the city. The cumulative setting for population, housing, and employment includes approved and proposed development in the region as well as development anticipated by the City of Shasta Lake as identified in the General Plan. **Table 4.2-4** provides population projections for the City of Shasta Lake over the next ten years, through the year 2023. Regional population, housing, and employment demographics are detailed in subsection 4.2.1, Existing Setting.

CUMULATIVE IMPACTS AND MITIGATION MEASURES

Cumulative Population Growth

Impact 4.2.2 Development of the Mountain Gate at Shasta project, along with approved and proposed development, would result in increased population in the City of Shasta Lake. This is considered a **less than cumulatively considerable** impact.

Cumulative development in the vicinity of the project would increase the population and number of housing units in the City of Shasta Lake and Shasta County. However, development of the project site has been planned since adoption of the City’s General Plan. The City anticipated that the proposed project site will be developed with a mix of uses and implemented with an Area Plan. By directing future development in this area, the City would meet future city needs for these uses, including accommodation of population, housing, and employment needs, while avoiding the potential for leapfrog development through the rest of the county. The environmental impacts of population growth associated with the proposed project are addressed in the various technical sections of this Draft EIR, with mitigation measures identified as necessary. In addition, indirect effects on existing facilities that could occur as a result of the project would be dealt with through the project’s provision of commercial sites, recreational and open space facilities, roadway improvements, and new infrastructure. As such,

the project's impacts to housing and population are considered **less than cumulatively considerable**. See Section 6.0 for a detailed analysis of the growth effects of the project.

Mitigation Measures

None required.

4.2 POPULATION/HOUSING/EMPLOYMENT

REFERENCES

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4.3 TRANSPORTATION AND CIRCULATION

This section analyzes the existing transportation system in the vicinity of the project area and addresses the potential transportation and circulation impacts resulting from the development of the Mountain Gate at Shasta Area Plan. This analysis is based on a Traffic Impact Analysis Report (2008) (**Appendix 4.3-1**) and the associated technical memorandum (2012) (**Appendix 4.3-2**), prepared by Omni-Means.

4.3.1 EXISTING SETTING

CALTRANS FACILITIES

Interstate 5 (I-5) is the main north–south facility through Shasta County. It extends the entire length of Shasta County, from its southern border with Tehama County to its northern border with Siskiyou County. West of the project site, I-5 is a four-lane freeway with interchanges at State Route (SR) 151 and Mountain Gate Boulevard. I-5 has a divided six-lane cross section in the vicinity of the project study area.

SR 151 is a major east–west arterial that traverses the heart of City of Shasta Lake. It begins at Shasta Lake and has its terminus at I-5. SR 151 is maintained by the California Department of Transportation (Caltrans).

SR 273 operates as an arterial from the northern end of the Center Business District to Benton Drive and as an expressway from Benton Drive to I-5. SR 273 merges/diverges with I-5 in north Redding and continues south through downtown Redding to the City of Anderson, where it again connects directly to I-5. The facility is primarily a four-lane divided roadway north and south of the downtown core with a speed limit ranging from 55 to 60 miles per hour (mph) at its northern and southern sections near I-5, reducing incrementally to 25–35 mph within the downtown core. In the vicinity of the project, the roadway operates as a four-lane and six-lane arterial with low access control (over four stops per mile).

CITY OF SHASTA LAKE ROADWAYS

Ashby Road is a north–south collector that connects SR 151 to the north and Pine Grove Avenue to the south in the City of Shasta Lake.

Montana Avenue is a north–south collector that facilitates traffic flow between the residential neighborhoods and SR 151 in the City of Shasta Lake.

Red Bluff Avenue and **Main Street** are east–west collectors that facilitate traffic flow between the residential neighborhoods and SR 151 in the City of Shasta Lake.

Mussel Shoals Avenue is a north–south collector that connects residential streets north of and parallel to SR 151 to SR 151. South of SR 151, the roadway names changes to Grand Coulee Boulevard, which eventually ties into Cascade Boulevard in the City of Shasta Lake.

Shasta Street is a north–south collector that traverses north and south of SR 151, connecting residential and retail development to SR 151. South of SR 151, it terminates at Cascade Boulevard in the City of Shasta Lake.

4.3 TRANSPORTATION AND CIRCULATION

Cascade Boulevard is a major north–south arterial parallel to I-5 along SR 151, running from the Pine Grove interchange in the City of Shasta Lake and the Oasis Road interchange in the City of Redding.

Pine Grove Avenue is an east–west collector street that extends east from Lake Boulevard to Leona Avenue in the City of Shasta Lake. The overpass has a three-lane cross section, two travel lanes with a center left turn lane.

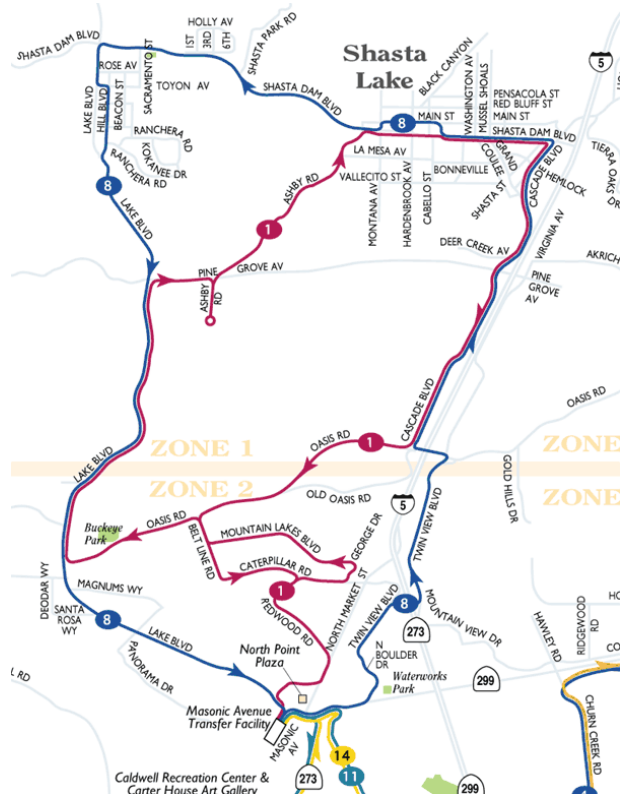
CITY OF REDDING ROADWAYS

Oasis Road is a two-lane arterial, generally in a northeast–southwest alignment in the northernmost sections of Redding. The roadway begins approximately 2.5 miles west of I-5 at Lake Boulevard and continues northeast through the I-5 interchange approximately 2 more miles before terminating at Old Oregon Trail. Old Oregon Trail serves as the continuation of the roadway northward. Oasis Road thus provides a direct continuation of Old Oregon Trail traffic to the south with access to I-5 and a direct route for traffic as it continues to or arrives from areas of downtown Redding or other locations to the south.

BICYCLE, PEDESTRIAN, AND TRANSIT SYSTEM

Although work-related bicycle activity is limited in the area, recreational bicycling is very popular. The segment of Shasta Dam Boulevard passing through the City of Shasta Lake is part of the popular Shasta Lake Bikeway route for cyclists. This route runs through the City of Shasta Lake along Pine Grove Avenue, Lake Boulevard, Ashby Road, and Shasta Dam Boulevard. The route is identified in the City of Redding (2004) *Parks, Trails, and Open Space Master Plan*. A proposed multipurpose trail would run parallel to Churn Creek. Currently, the City of Shasta Lake is working on the Shasta Dam Boulevard Concept Plan, which includes 6-foot-wide bike lanes in both street directions.

The commercial and office uses along Shasta Dam Boulevard, Pine Grove Avenue, and Cascade Boulevard are the primary areas of pedestrian travel. Crosswalks are located along the corridor in the downtown area, providing pedestrian access to businesses and neighborhoods on the north and south side of Shasta Dam Boulevard. The Land Use and Circulation elements of the City's General Plan include a trail system along Cascade Boulevard that would provide additional connectivity for pedestrian transport in the vicinity of the project site.



Public transit in the area is provided by the Redding Area Bus Authority (RABA), which offers both fixed-route and demand-response transit services. RABA provides bus service throughout Redding, as well as in Shasta Lake's downtown area. RABA currently operates 12 fixed routes for the cities of Redding, Shasta Lake, and Anderson, and 12 paratransit vehicles for demand-response service. All fixed routes operate Monday through Friday on one-hour headways. There are no bus stops that would serve the project site. According to the RABA (2001) Master Transit Plan Study, Routes 1 and 8 carry 77 percent of RABA's total passenger trips. A new route (Route 15) is being proposed at the southern end of the project site along Mountain View Boulevard, Twin View Boulevard, and North Boulder Drive.

OTHER TRANSPORTATION INFRASTRUCTURE

Shasta County is served by the Union Pacific Railroad (UPRR), a single-track mainline that parallels I-5. The UPRR extends along the western boundary of the Area Plan in a general north-south direction. On average, approximately 25 freight trains travel along this track on a daily basis. The UPRR rail line carries both passengers and freight. The Shasta Regional Transportation Agency's (2010) Regional Transportation Plan for Shasta County states that 6,781 boardings were made at the Amtrak station in Redding for the 2007/2008 fiscal year, with an additional 12,824 Amtrak bus connections to the Capital Corridor and San Joaquin trains.

EXISTING TRAFFIC VOLUMES

Omni-Means conducted a study that evaluated daily roadway segment traffic volume counts (turning movements) and the existing morning (AM) and evening (PM) peak-hour traffic volume counts at 34 intersections. This data was collected when school was in session. Although the holidays will have different traffic conditions, it is not the industry standard to design transportation facilities to accommodate holiday traffic. The traditional AM and PM peak hours were selected in coordination with the City of Shasta Lake and Caltrans. Based on the 24-hour average daily trip (ADT) counts collected by Omni-Means on the study roadway segments, the peak hours based on the counts matched the peak hours selected for analysis. The AM peak hour is defined as one hour of peak traffic flow counted between 7:00 AM and 9:00 AM; the PM peak hour is defined as one hour of peak traffic flow counted between 4:00 PM and 6:00 PM. The Caltrans 2004 hourly counts on I-5, 0.8 mile north of the Mountain Gate Boulevard interchange, were analyzed to compare the September traffic (when counts were done) to the summer traffic (months of May, June, and July), and the data is presented in **Table 4.3-1**.

TABLE 4.3-1
MOUNTAIN GATE INTERCHANGE AVERAGE DAILY TRIPS (ADT)

	ADT
Weekday Average in May 2004	21,020
Weekday Average in June 2004	23,778
Weekday Average in July 2004	27,471
Summer Weekday Average 2004	24,090
September Weekday Average 2004	25,963

Source: Omni-Means 2008

4.3 TRANSPORTATION AND CIRCULATION

As shown in **Table 4.3-1**, the September weekday ADT was found to be higher than the summer average ADT and is therefore considered appropriate for this study.

TRAFFIC STUDY AREA

The study locations discussed below were included in the assessment of project-related impacts.

Intersections

Table 4.3-2 lists the study intersections, which were established through consultations with City of Shasta Lake and Caltrans staff, included for Near-Term, Year 2020, and Year 2030 traffic impact analysis for conditions both without and with the proposed project. **Figure 4.3-1** illustrates the 34 study intersections.

TABLE 4.3-2
MOUNTAIN GATE AT SHASTA – INTERSECTIONS

#	Intersection	Jurisdiction	Acceptable LOS Threshold
1	Wonderland Boulevard/Mountain Gate Road	COS	C
2	Mountain Gate Road/I-5 southbound (SB) Ramps	COS	C
3	Mountain Gate Road/I-5 northbound (NB) Ramps	COS	C
4	Mountain Gate Road/Holiday Road	COS	C
5	SR 151/Ashby Road	COSL	C
6	SR 151 (WB)/Montana Avenue	COSL	C
7	SR 151 (EB)/Montana Avenue	COSL	C
8	SR 151/Median Avenue	COSL	C
9	Mussel Shoals Avenue/Red Bluff Street	COSL	C
10	Mussel Shoals Avenue/Main Street	COSL	C
11	SR 151/Mussels Shoals Avenue	COSL	C
12	Shasta Way/Front Street	COSL	C
13	SR 151/Shasta Street	COSL	C
14	SR 151/Cascade Boulevard	COSL	C
15	SR 151/I-5 SB Off-Ramp	COSL	C
16	Lake Boulevard/Pine Grove Avenue	COS	C
17	Pine Grove Avenue/Ashby Road	COSL	C
18	Pine Grove Avenue/Cascade Boulevard	COSL	C
19	Pine Grove Avenue/I-5 SB Ramps	COSL	C
20	Pine Grove Avenue/I-5 NB Ramps	COSL	C
21	Pine Grove Avenue/Twin View Boulevard	COSL	C
22	Oasis Road/Cascade Boulevard	COR	C
23	Oasis Road/I-5 SB Ramps	COR	C

#	Intersection	Jurisdiction	Acceptable LOS Threshold
24	Oasis Road/I-5 NB Ramps	COR	C
25	Oasis Road/Twin View Boulevard	COR	C
26	SR 273/Caterpillar Road	COR	D
27	SR 273/Northpoint Drive	COR	D
28	SR 273/Lake Boulevard (SR 299)	COR	D
29	SR 299/I-5 SB Ramps	COR	D
30	SR 299/I-5 NB Ramps	COR	D
31	Cypress Avenue/Bechelli Lane	COR	C
32	Cypress Avenue/I-5 SB Ramps	COR	D
33	Cypress Avenue/I-5 NB Ramps	COR	D
34	Cypress Avenue/Hilltop Drive	COR	C

Source: Omni-Means 2008

Notes: COS – County of Shasta; COR – City of Redding; COSL – City of Shasta Lake.

Mountain Gate Road is also known as Old Oregon Trail.

Roadway Segments

Table 4.3-3 lists the roadway segments, which were selected in coordination with City of Shasta Lake and Caltrans staff, included for existing, short-term, and cumulative traffic impacts for conditions both without and with the proposed project.

TABLE 4.3-3
MOUNTAIN GATE AT SHASTA – ROADWAYS

#	Roadway	Jurisdiction	Acceptable LOS Threshold
1	Shasta Dam Boulevard – Between North Boulevard and Ashby Road	COSL	C
2	Ashby Road – Between Fort Peck Street and Flower Street	COSL	C
3	Montana Avenue – Between Main Street and Front Street	COSL	C
4	Red Bluff Street – Between Washington Avenue and Grand River Avenue	COSL	C
5	Main Street – Between Washington Avenue and Grand River Avenue	COSL	C
6	Mussel Shoals Avenue – Between Front Street and Shasta Dam Boulevard (SR 151)	COSL	C
7	Grand Coulee Boulevard – Between Fort Peck Street and Shasta Dam Boulevard (SR 151)	COSL	C
8	Pine Grove Avenue – Between Lake Boulevard and Ashby Road	COSL	C
9	Cascade Boulevard – Between Pine Grove Avenue and Deer Creek Avenue	COSL	C
10	Pine Grove Avenue – West of Cascade Boulevard	COSL	C
11	SR 273 – Between Twin View Boulevard and Lake Boulevard	COR	D

Source: Omni-Means 2008

Notes: COS – County of Shasta; COR – City of Redding; COSL – City of Shasta Lake Freeway Mainline Segments

4.3 TRANSPORTATION AND CIRCULATION

Caltrans requested that the traffic study analyze all state facilities impacted by 50 or more peak-hour project trips (based on the Caltrans *Guide for the Preparation of Traffic Impact Studies*, dated December 2002). Based on the methodology, the following mainline facilities were found to be impacted by the proposed project and have been analyzed in the study:

- 1) Mainline I-5 – between Cypress Street and SR 44
- 2) Mainline I-5 – between SR 44 and SR 299
- 3) Mainline I-5 – between SR 299 and Twin View Boulevard
- 4) Mainline I-5 – between Twin View Boulevard and North Market Street (SR 273)
- 5) Mainline I-5 – between SR 273 and Oasis Road
- 6) Mainline I-5 – between Oasis Road and Pine Grove Avenue
- 7) Mainline I-5 – between Pine Grove Avenue and SR 151
- 8) Mainline I-5 – between SR 151 and Mountain Gate Boulevard

Merge/Diverge Junctions

The following merge/diverge junction roadway segments, which were selected in coordination with City of Redding, City of Shasta Lake, and Caltrans staff, were included for existing, short-term, and cumulative traffic impacts for conditions both without and with the proposed project:

- 1) I-5 and Cypress Avenue (northbound (NB) on-ramp, southbound (SB) off-ramp only)
- 2) I-5 and SR 44 (NB loop on-ramp, NB direct on-ramp, SB direct off-ramp, SB loop off-ramp only)
- 3) I-5 and SR 273 (NB on-ramp, SB off-ramp only)
- 4) I-5 and Oasis Road (NB on-ramp, SB off-ramp only)
- 5) I-5 and SR 151
- 6) I-5 and Mountain Gate Boulevard

TRAVEL DEMAND FORECASTS

The Shasta County Travel Demand Model (2006 model update) is a conventional four-step travel demand forecasting model that is similar in structure to many countywide models used throughout Northern California. The model uses land use and road network data generated by planners in various agencies to estimate travel patterns for base year (2004) and future year conditions and covers all of Shasta County. The county is divided into 1,600 transportation analysis zones (TAZs). External travel to and from Shasta County is represented by 15 gateway zones (external stations) at major road crossings of the county line.

The updated Traffic Demand Model was a collaborative effort between the Shasta Regional Transportation Agency (SRTA), Caltrans, Shasta County, the City of Shasta Lake, the City of

Redding, the City of Anderson, and the model developer. Specifically, all model assumptions and results have been reviewed by all responsible agencies in the area that have approved the model for use.

TRAFFIC SCENARIOS

The Existing condition describes the existing transportation facilities serving the project site and the traffic operations that currently exist for those facilities.

The Near-Term condition refers to analysis that would exist following approximately three years of assumed development (2013–2015) in Shasta Lake, Anderson, Redding, and Shasta County. The Near-Term No Project condition investigates traffic operations after three years of assumed development, but excluding development of the portion of the proposed project that this study assumes to be in place at that time. The Near-Term Plus Project condition is the analysis scenario investigating traffic impacts associated with the development of the portion of the proposed project that this study assumes to be in place following approximately three years of assumed development in Shasta Lake, Anderson, Redding, and Shasta County. The Near-Term Plus Project condition is investigated in comparison to the Near-Term No Project condition scenario.

The Year 2020 condition refers to analysis that would exist at that time. The Year 2020 No Project condition investigates traffic operations in Year 2020, but excluding development of the proposed project. The Year 2020 Plus Project condition is the analysis scenario in which traffic impacts associated with full buildout of the proposed project (though full buildout is not anticipated by 2020) are investigated in comparison to the Year 2020 No Project condition scenario.

Year 2030 conditions refer to analysis that would exist in 2030. The Year 2030 No Project condition investigates traffic operations in Year 2030, but excluding development of the proposed project. The Year 2030 Plus Project condition is the analysis scenario in which traffic impacts associated with full buildout of the proposed project are investigated in comparison to the Year 2030 No Project condition scenario.

4.3 TRANSPORTATION AND CIRCULATION

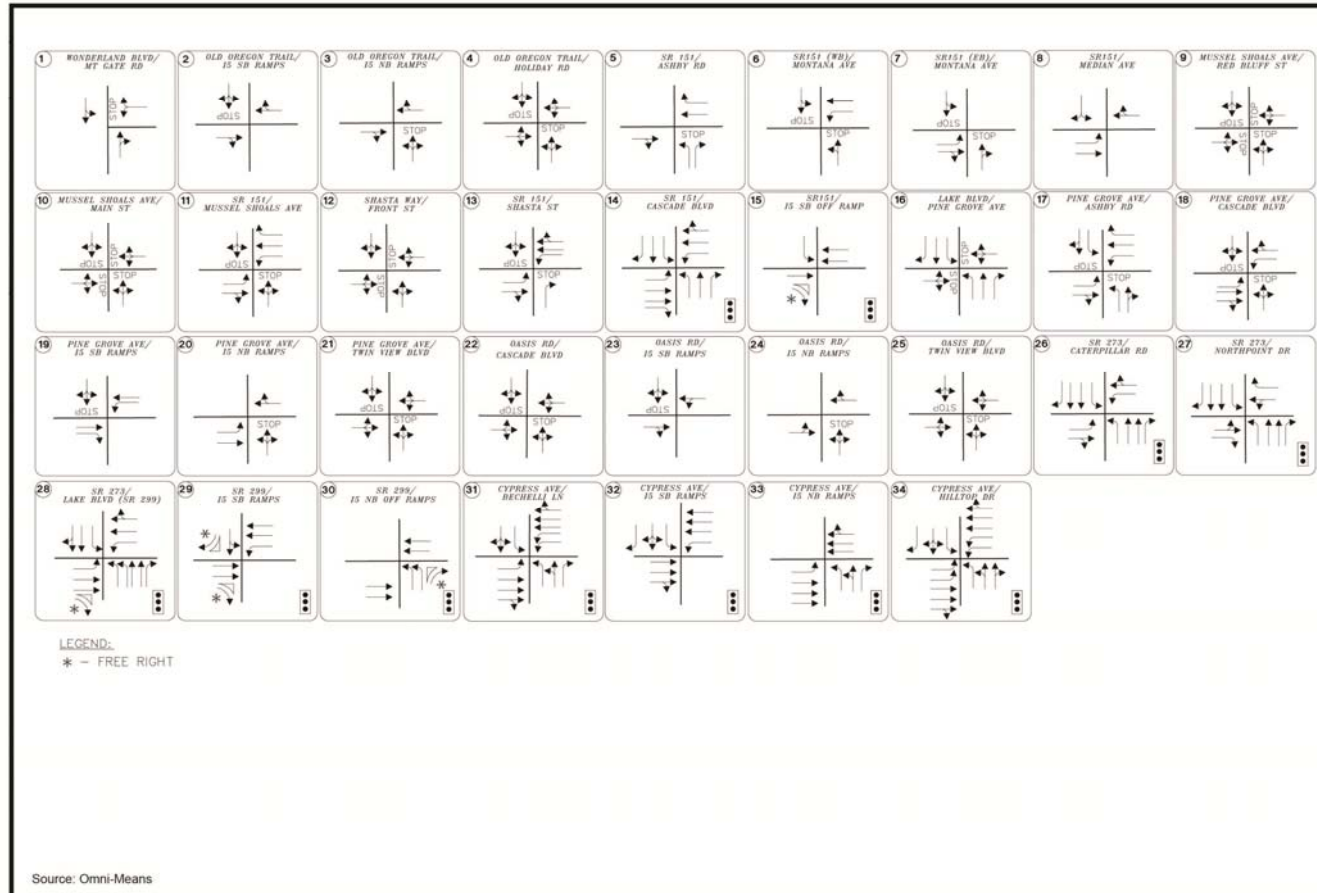


Figure 4.3-1
Existing Lane Geometrics and Control

PMC

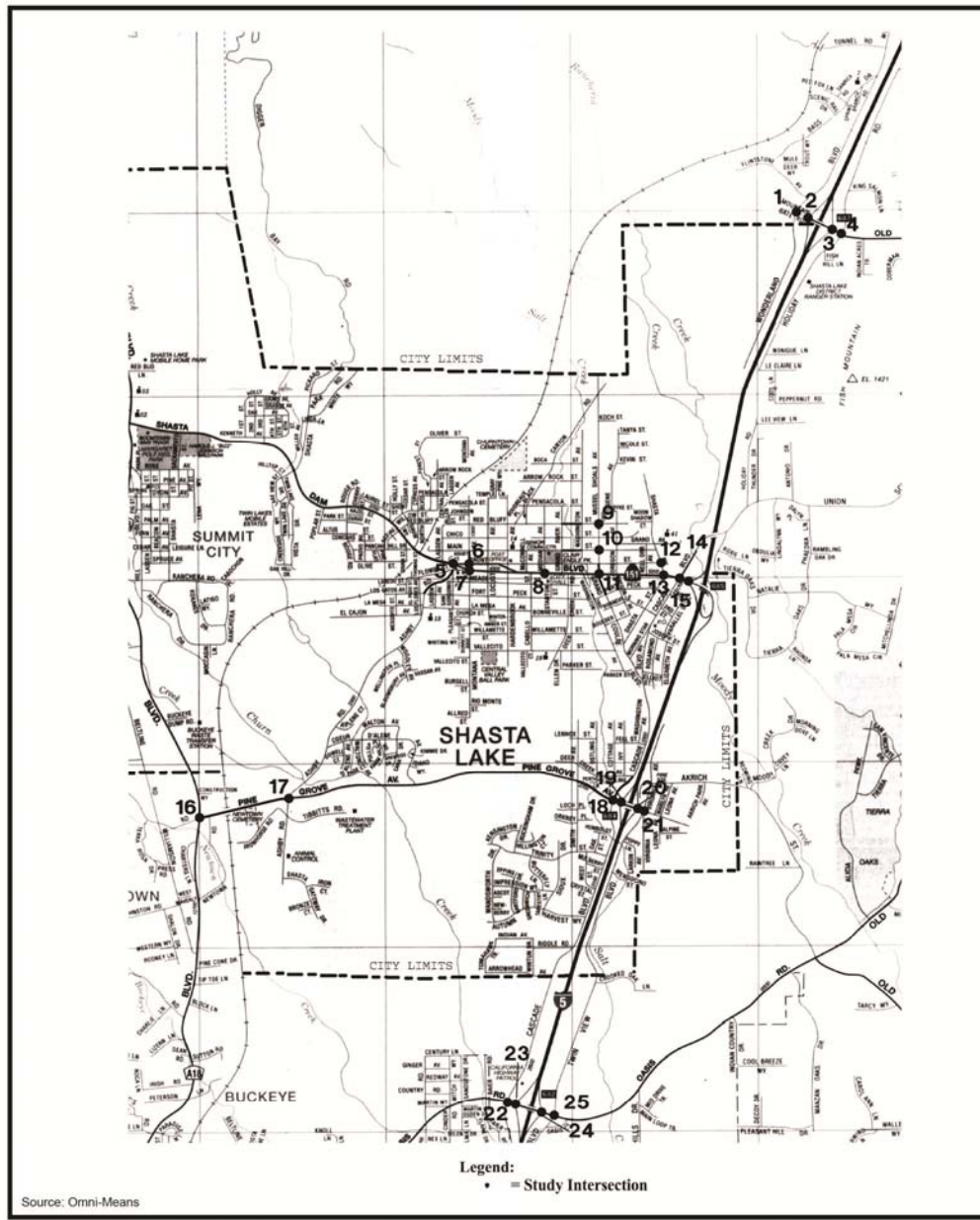


Figure 4.3-2
Study Intersections - Northern Study Area
Mountain Gate at Shasta

PMC

4.3 TRANSPORTATION AND CIRCULATION

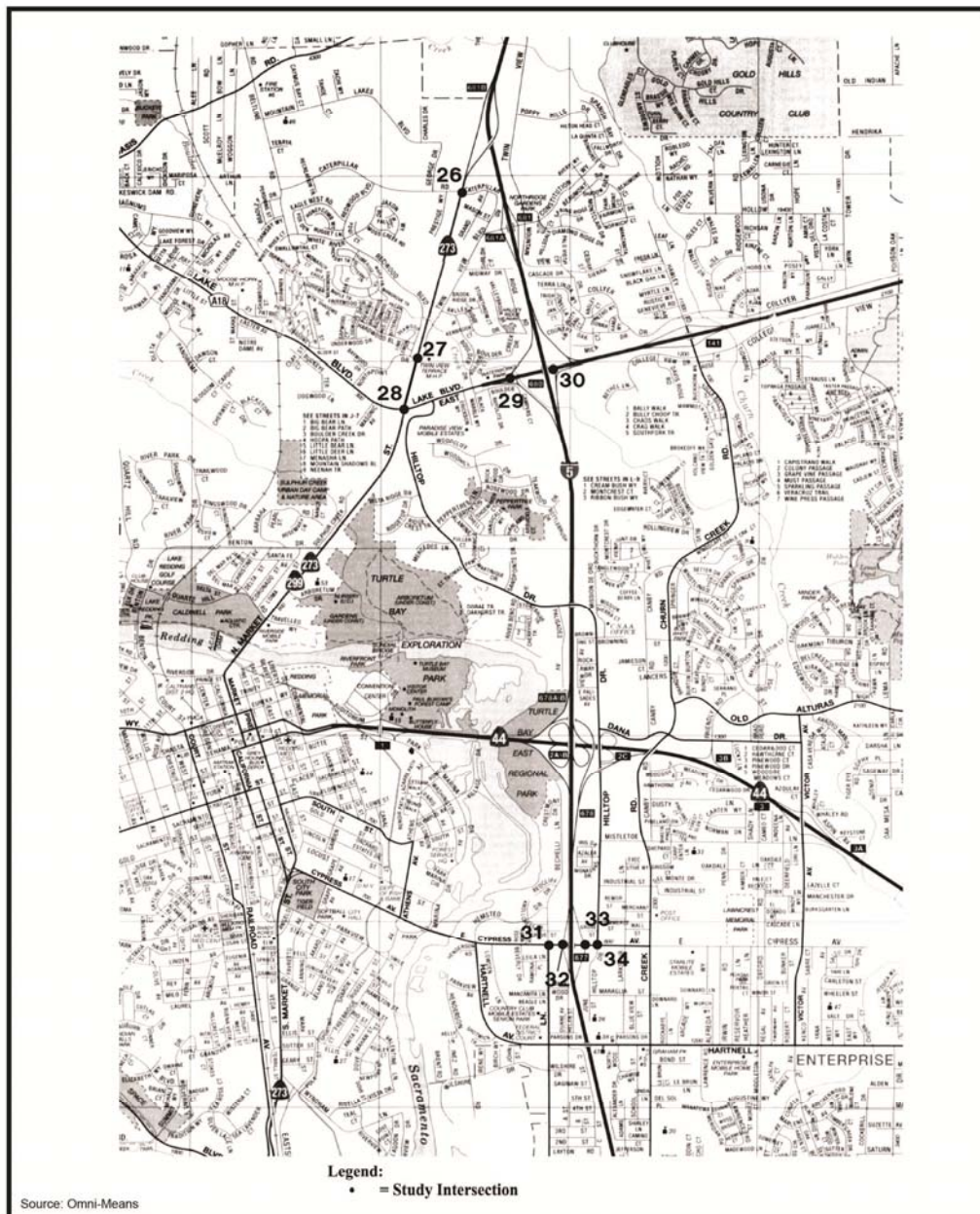


Figure 4.3-3
Study Intersections - Southern Study Area
Mountain Gate at Shasta

PMC

Existing Traffic Conditions

Traffic operations have been quantified through the determination of level of service (LOS). Level of service is a qualitative measure of traffic operating conditions, whereby a letter grade A through F is assigned to an intersection or roadway segment representing progressively worsening traffic conditions.

Omni-Means conducted a detailed analysis of the study roadway segments, intersections, and freeway facilities under existing conditions. Areas identified as operating acceptably do not exceed the level of service threshold for the jurisdiction or agency operating the roadway as shown below:

- 1) County of Shasta – LOS C
- 2) City of Redding – LOS C
- 3) City of Shasta Lake – LOS C
- 4) Caltrans – LOS C

Tables 4.3-4 through 4.3-7 summarize the existing conditions of intersections, roadways, freeway segments, and freeway ramp merge/diverge in the study area. These tables are also shown in **Appendix 4.3-1** of this Draft EIR.

Intersections

Existing intersection operations were evaluated utilizing the existing peak-hour traffic volumes shown in **Table 4.3-4**.

TABLE 4.3-4
PEAK-HOUR INTERSECTION LOS RESULTS – EXISTING CONDITIONS

#	Intersection	Control Type	Target LOS	AM Peak Hour			PM Peak Hour		
				Delay	LOS	Warrant Met?	Delay	LOS	Warrant Met?
1	Wonderland Boulevard/Mt. Gate Rd	AWSC	C	9.7	A	–	8.6	A	–
2	Mt. Gate Rd/I-5 SB Ramps	TWSC	C	9.4	A	–	10.5	B	–
3	Mt. Gate Rd/I-5 NB Ramps	TWSC	C	12.0	B	–	10.0	A	–
4	Mt. Gate Rd/Holiday Rd	TWSC	C	10.6	B	–	10.0	A	–
5	SR 151/Ashby Rd	TWSC	C	12.0	B	no	11.4	B	no
6	SR 151 (WB)/Montana Ave	TWSC	C	13.8	B	no	13.9	B	no
7	SR 151 (EB)/Montana Ave	TWSC	C	15.3	C	no	13.3	B	no
8	SR 151/Median Ave	TWSC	C	20.4	C	no	24.7	C	no
9	Mussel Shoals Ave/Red Bluff St	AWSC	C	7.0	A	no	7.2	A	no
10	Mussel Shoals Ave /Main St	AWSC	C	7.2	A	no	7.2	A	no
11	SR 151/Mussels Shoals Ave	TWSC	C	29.6	D	no	33.6	D	no

4.3 TRANSPORTATION AND CIRCULATION

#	Intersection	Control Type	Target LOS	AM Peak Hour			PM Peak Hour		
				Delay	LOS	Warrant Met?	Delay	LOS	Warrant Met?
12	Shasta Way/Front St	TWSC	C	9.0	A	no	9.4	A	no
13	SR 151/Shasta Street	TWSC	C	328.8	F	yes	86.7	F	no
14	SR 151/Cascade Boulevard	Signal	C	24.5	C	–	21.7	C	–
15	SR 151/I-5 SB Off-Ramp	Signal	C	10.5	B	–	12.0	B	–
16	Lake Boulevard/Pine Grove Ave	TWSC	C	12.3	B	no	14.4	B	no
17	Pine Grove Ave/Ashby Rd	TWSC	C	12.6	B	no	11.5	B	no
18	Pine Grove Ave/Cascade Boulevard	TWSC	C	22.4	C	no	33.8	D	no
19	Pine Grove Ave/I-5 SB Ramps	TWSC	C	10.6	B	no	17.5	C	no
20	Pine Grove Ave/I-5 NB Ramps	TWSC	C	12.1	B	no	17.5	C	no
21	Pine Grove Ave/Twin View Boulevard	TWSC	C	10.3	B	no	10.7	B	no
22	Oasis Rd/Cascade Boulevard	TWSC	C	25.5	D	no	33.0	D	no
23	Oasis Rd/I-5 SB Ramps	TWSC	C	22.3	C	no	14.7	B	no
24	Oasis Rd/I-5 NB Ramps	TWSC	C	29.8	D	no	68.8	F	yes
25	Oasis Rd/Twin View Boulevard	TWSC	C	14.2	B	no	14.5	B	no
26	SR 273/Caterpillar Rd	Signal	D	31.2	C	–	26.4	C	–
27	SR 273/Northpoint Dr	Signal	D	16.7	B	–	21.8	C	–
28	SR 273/Lake Boulevard (SR 299)	Signal	D	26.5	C	–	36.6	D	–
29	SR 299/I-5 SB Ramps	Signal	D	10.4	B	–	12.1	B	–
30	SR 299/I-5 NB Ramps	Signal	D	18.8	B	–	18.1	B	–
31	Cypress Ave/Bechelli Lane	Signal	C	21.0	C	–	30.5	C	–
32	Cypress Ave/I-5 SB Ramps	Signal	D	15.9	B	–	22.4	C	–
33	Cypress Ave/I-5 NB Ramps	Signal	D	17.4	B	–	19.6	B	–
34	Cypress Ave/Hilltop Dr	Signal	C	22.9	C	–	28.1	C	–

Source: Omni-Means 2008

Notes: Bolded entries indicate intersections operating at unacceptable LOS. TWSC = two-way stop control; AWSC = All-way stop control; Warrant = Caltrans peak-hour volume-based signal warrant. Delay in seconds. Mountain Gate Road also known as Old Oregon Trail.

As shown in **Table 4.3-4**, every intersection within the project study area is currently operating at acceptable LOS C or better during the AM and PM peak-hour periods, with the following exceptions:

- Intersection number 11, SR 151/Mussel Shoals Avenue
- Intersection number 13, SR 151/Shasta Street
- Intersection number 18, Pine Grove Avenue/Cascade Boulevard

- Intersection number 22, Oasis Road/Cascade Boulevard
- Intersection number 24, Oasis Road/I-5 NB Ramps

Roadway Segments

Existing daily traffic operations along roadway segments were analyzed by comparing existing ADT volumes to the ADT-based level of service thresholds that correspond to the existing roadway type. **Table 4.3-5** contains a summary of the existing roadway segment LOS conditions.

**TABLE 4.3-5
ROADWAY SEGMENT LOS RESULTS – EXISTING CONDITIONS**

Roadway	Capacity Configuration	Average Daily Traffic Volumes	LOS
Shasta Dam Boulevard – Between North Boulevard and Ashby Road	2-Lane Undivided Arterial	6,753	A
Ashby Road – Between Fort Peck Street and Flower Street	2-Lane Collector	3,974	A
Montana Avenue – Between Main Street and Front Street	2-Lane Collector	1,392	A
Red Bluff Street – Between Washington Avenue and Grand River Avenue	Residential	387	A
Main Street – Between Washington Avenue and Grand River Avenue	Residential	517	A
Mussel Shoals Avenue – Between Front Street and Shasta Dam Boulevard (SR 151)	Residential Collector with Frontages	1,275	A
Grand Coulee Boulevard – Between Fort Peck Street and Shasta Dam Boulevard (SR 151)	2-Lane Collector	1,361	A
Pine Grove Avenue – Between Lake Boulevard and Ashby Road	2-Lane Undivided Arterial	4,091	A
Cascade Boulevard – Between Pine Grove Avenue and Deer Creek Avenue	2-Lane Undivided Arterial	3,666	A
Pine Grove Avenue – West of Cascade Boulevard	2-Lane Undivided Arterial	3,977	A
SR 273 – Between Twin View Boulevard and Lake Boulevard	4-Lane Divided Arterial	11,562	A

Source: Omni-Means 2008

As indicated in **Table 4.3-5**, all of the study roadway segments are currently operating at acceptable LOS A on a daily basis with the existing capacity configurations.

Freeway Mainline Segments

Existing peak-hour mainline operations were evaluated utilizing the existing peak-hour volumes shown in **Table 4.3-6**.

4.3 TRANSPORTATION AND CIRCULATION

TABLE 4.3-6
FREEWAY MAINLINE LOS RESULTS – EXISTING CONDITIONS

Freeway Mainline Segment	Number of Lanes	Target LOS	AM Peak Hour			PM Peak Hour		
			Volume	Density (pc/mi/ln)	LOS	Volume	Density (pc/mi/ln)	LOS
I-5 NB, south of Cypress Avenue Interchange	2	D	2,790	28.2	D	3,433	41.2	E
I-5 SB, south of Cypress Avenue Interchange	2	D	3,021	31.9	D	2,473	24.2	C
I-5 NB, north of Cypress Avenue Interchange	3	D	3,168	23.3	C	3,899	30.5	D
I-5 SB, north of Cypress Avenue Interchange	3	D	3,431	25.5	C	2,808	20.4	C
I-5 NB, north of SR 44 Interchange	2	D	2,743	27.6	D	3,375	39.5	E
I-5 SB, north of SR 44 Interchange	2	D	2,970	31.0	D	2,431	23.7	C
I-5 NB, north of SR 299 Interchange	2	D	2,104	20.3	C	2,589	25.6	C
I-5 SB, north of SR 299 Interchange	2	D	2,279	22.1	C	1,865	18.0	B
I-5 NB, north of Twin View Boulevard Interchange	2	D	1,821	17.6	B	2,240	21.7	C
I-5 SB, north of Twin View Boulevard Interchange	2	D	1,972	19.0	C	1,614	15.6	B
I-5 NB, north of SR 273 Interchange	3	D	2,199	14.3	B	2,706	17.7	B
I-5 SB, north of SR 273 Interchange	3	D	2,381	15.5	B	1,949	12.7	B
I-5 NB, north of Oasis Road Interchange	3	D	1,797	12.7	B	2,211	15.6	B
I-5 SB, north of Oasis Road Interchange	3	D	1,946	13.7	B	1,593	11.2	B
I-5 NB, north of Pine Grove Avenue Interchange	3	C	1,584	11.7	B	1,949	14.2	B
I-5 SB, north of Pine Grove Avenue	3	C	1,716	12.5	B	1,404	10.3	A
I-5 NB, north of SR 151 Interchange	2	C	1,140	12.7	B	1,402	15.5	B
I-5 SB, north of SR 151 Interchange	2	C	1,234	13.9	B	1,010	11.2	B
I-5 NB, north of Mountain Gate Boulevard Interchange	2	C	1,031	10.7	A	1,269	13.2	B
I-5 SB, north of Mountain Gate Boulevard Interchange	2	C	1,116	11.6	B	914	9.5	A

Source: Omni-Means 2008

Notes: **Bolded** entries indicate segments operating at unacceptable LOS.

As indicated in **Table 4.3-6**, all of the study freeway mainline segments were found to be currently operating acceptably for the AM and PM peak-hour periods, with the following exceptions:

- I-5 NB, south of Cypress Avenue interchange
- I-5 NB, north of SR 44 interchange

Ramp Junctions

Existing ramp merge/diverge operations were evaluated utilizing the existing peak-hour traffic volumes shown in **Table 4.3-7**.

**TABLE 4.3-7
RAMP MERGE/DIVERGE LOS – EXISTING CONDITIONS**

I-5 & Cypress Avenue	Junction Type	Target LOS	AM Peak Hour			PM Peak Hour		
			Volume	Density (pc/mi/ln)	LOS	Volume	Density (pc/mi/ln)	LOS
I-5 NB On-Ramp	Merge	D	652	19.5	B	913	25.0	C
I-5 SB Off-Ramp	Diverge	D	1,102	26.8	C	833	23.9	C
I-5 & SR 44	Junction Type	Target LOS	AM Peak Hour			PM Peak Hour		
			Volume	Density (pc/mi/ln)	LOS	Volume	Density (pc/mi/ln)	LOS
I-5 NB Loop On-Ramp	Merge	D	520	27.1	C	530	33.6	D
I-5 NB Direct On-Ramp	Merge	D	285	20.4	C	530	24.4	C
I-5 SB Direct Off-Ramp	Diverge	D	700	38.8	E	715	32.5	D
I-5 SB Loop Off-Ramp	Diverge	D	290	34.1	D	300	27.7	C
I-5 & SR 273	Junction Type	Target LOS	AM Peak Hour			PM Peak Hour		
			Volume	Density (pc/mi/ln)	LOS	Volume	Density (pc/mi/ln)	LOS
I-5 NB On-Ramp	Merge	D	173	19.1	B	388	24.2	C
I-5 SB Off-Ramp	Diverge	D	409	23.9	C	271	22.8	C
I-5 & Oasis Road	Junction Type	Target LOS	AM Peak Hour			PM Peak Hour		
			Volume	Density (pc/mi/ln)	LOS	Volume	Density (pc/mi/ln)	LOS
I-5 NB On-Ramp	Merge	D	60	12.3	B	88	15.0	B

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I-5 SB Off-Ramp	Diverge	D	96	16.8	B	88	14.1	B
I-5 & SR 151	Junction Type	Target LOS	AM Peak Hour			PM Peak Hour		
			Volume	Density (pc/mi/ln)	LOS	Volume	Density (pc/mi/ln)	LOS
I-5 NB Off-Ramp	Diverge	C	540	15.4	B	676	19.1	B
I-5 NB On-Ramp	Merge	C	158	8.8	A	113	10.4	B
I-5 SB Off-Ramp	Diverge	C	41	16.0	B	95	13.2	B
I-5 SB On-Ramp	Diverge	C	763	15.9	B	445	11.1	B
I-5 & Mountain Gate Boulevard	Junction Type	Target LOS	AM Peak Hour			PM Peak Hour		
			Volume	Density (pc/mi/ln)	LOS	Volume	Density (pc/mi/ln)	LOS
I-5 NB Off-Ramp	Diverge	C	179	18.6	B	189	21.5	C
I-5 NB On-Ramp	Merge	C	34	16.8	B	45	19.5	B
I-5 SB Off-Ramp	Diverge	C	18	17.9	B	35	15.4	B
I-5 SB On-Ramp	Merge	C	238	16.1	B	140	12.8	B

Source: Omni-Means 2008

Notes: **Bolded** entries indicate segments operating at unacceptable LOS.

As indicated in **Table 4.3-7**, all of the study ramp merge/diverge junctions are currently operating at acceptable LOS with the following exceptions:

- I-5 and SR 44 – SB direct off-ramp

4.3.2 REGULATORY FRAMEWORK

Existing transportation policies, laws, and regulations that would apply to the proposed project are summarized below. This information provides a context for the input discussion related to the proposed project's consistency with applicable regulatory conditions.

STATE

California Department of Transportation (Caltrans)

Caltrans policies are applicable to I-5, SR 273, and SR 151 and are summarized in the Caltrans (2002) *Guide for the Preparation of Traffic Impact Studies*. These guidelines identify when a traffic impact study is required, what should be included in the study, analysis scenario, and guidance on acceptable analysis methodologies. The Caltrans guide states the following:

Caltrans endeavors to maintain a target LOS at the transition between LOS C and LOS D on State highway facilities; however, Caltrans acknowledges that this may not be always feasible and recommends that the lead agency consult with Caltrans to determine the appropriate target LOS.

Caltrans endeavors to maintain a target service level of LOS C on state highway facilities. However, this may not always be feasible. As the project progresses, Caltrans and the City of Shasta Lake will need to consult regularly to determine the appropriate target level of service for a given improvement. For the purposes of this Draft EIR, LOS C is considered the minimum acceptable operating level for Caltrans-controlled facilities (i.e., SR 273 intersections/roadway segments, I-5 merge/diverge, and I-5 ramp terminal intersections).

LOCAL

Shasta Regional Transportation Agency

The Shasta Regional Transportation Agency (SRTA) is the federally designated metropolitan planning organization and state-designated regional transportation planning agency for Shasta County. State law requires each regional transportation agency to adopt and submit an updated regional transportation plan (RTP) to the California Transportation Commission and Caltrans every four years in urban regions and every five years in federally designated air quality attainment areas (Government Code Section 65080[d]). The plan is to be action-oriented and pragmatic, considering both the short- and long-term future, and provide clear and concise policy guidance to local and state officials.

In addition to consolidating local needs into a coherent regional vision, the 2010 Regional Transportation Plan for Shasta County (SRTA 2010) has many specific objectives and responsibilities, including those quoted below.

- *Attempt to resolve regional mobility issues and provide policy direction for local plans through the achievement of a coordinated, balanced regional transportation system, including mass transportation, highway, railroad, aviation, bicycle, and pedestrian facilities.*
- *Identify and document the mobility needs and issues of the region in terms of the transportation system, land use, financial needs, air quality and environmental considerations, including wetlands, endangered species, and cultural resources.*
- *Provide the foundation for transportation decisions by local, regional, state, and federal officials to resolve the region's mobility and accessibility needs.*
- *Document the goals, policies, and objectives of the region for meeting current and future transportation mobility needs while meeting air quality requirements.*
- *Identify the specific actions planned to address the regional mobility needs and issues consistent with regional, state, and federal policies, and identify those agencies responsible for implementing the actions.*
- *Identify transportation improvements in sufficient detail to aid in the development of the regional transportation improvement program (RTIP), state transportation improvement program (STIP), and the federal transportation improvement program (FTIP), to be useful in making decisions related to the development and growth of the*

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region, and to permit an estimate of emissions impacts for showing conformity with the State Implementation Plan (SIP) for achieving air quality standards.

- Document the financial resources needed to implement the regional transportation plan and meet required emissions reductions and performance standards.*
- Promote consistency between the California Transportation Plan, the regional planning process, and local plans in responding to statewide and interregional transportation issues and needs, and by providing input to the California Transportation Plan.*
- Inform the public, federal, state, and local agencies, federally recognized tribes, and local elected officials who make land use and other project decisions of the transportation planning process and related socioeconomic, air quality, and environmental concerns.*

The Shasta Metropolitan Improvement Program (SRTA 2011) provides a comprehensive list of improvements and prospective funding sources needed to address congestion on Shasta County's regional transportation system, including freeways, interchanges, and key arterials. The program reflects the need to evolve and adapt to the new reality of transportation funding. While interstate highway improvements were once entirely funded by the state and federal governments, in recent years it has become necessary for regions to become a financial partner to fund vital transportation projects.

City of Shasta Lake General Plan

The primary guide to future land development in the undeveloped areas of the City of Shasta Lake is the City's General Plan. State law requires that all local governments prepare a general plan for future development in their jurisdictions. The City's current General Plan was adopted in 1994 and revised in 1999. The goals, objectives, and policies of the General Plan pertaining to circulation in the city are discussed below. While this Draft EIR analyzes the project's consistency with the General Plan pursuant to California Environmental Quality Act (CEQA) Section 15125(d), it is the City of Shasta Lake Planning Commission and/or City Council that will make the determination of the project's consistency with the identified General Plan policies.

TABLE 4.3-8
PROJECT CONSISTENCY WITH CITY OF SHASTA LAKE
GENERAL PLAN: TRANSPORTATION

General Plan Goals & Policies	Consistent with General Plan?	Analysis
Circulation Policies		
C-a Monitor, maintain and improve, as necessary, the operation, safety and performance of the street system, including roadway surfaces, capacity, and traffic signals. For capacity and operational purposes, strive to attain a Level of Service (LOS) "C," to the maximum degree feasible, so that potential traffic congestion on streets and at intersections is minimized.	Yes	The traffic impact analysis has identified that all intersections and roadways providing access to the project will operate at an acceptable level of service with mitigation incorporated. The impact analysis determined that I-5 and ramp merge/diverge conditions will not operate at acceptable levels of service.
C-c Provide for adequate, safe, and direct, and if necessary, alternative access to public facilities, schools, parks and shopping areas.	Yes	The project includes both a trail and a road system that links all development areas. The project also includes a circulation plan linking to existing roads north and south, and with pedestrian connection to the west.
C-f Encourage bicycle and pedestrian transportation, both on- and off-street.	Yes	The project includes both bike lanes associated with roadways as well as separate trails and paths.
Circulation Implementation Measures		
C-(8) Continue to require that new development pays a fair share of the costs of street and other traffic and transportation improvements based on traffic generated and impacts on service levels.	Yes	The project will pay a pro rata share of the cost of intersections, roadways, and ramp improvements to the City of Shasta Lake.
C-(11) Development of vacant parcels will require the developer or property owner to pay a fee that will be used toward the improvement of the "Minor Arterial" and "Collector" streets identified in Circulation Table C-1.	Yes	The project will pay a pro rata share of the cost of intersections, roadways, and ramp improvements to the City of Shasta Lake.
C-(14) Development shall mitigate any adverse impacts of a proposed development project on the existing street system. This may include necessary street improvements, traffic signs or signals.	Yes	The project will pay a pro rata share of the cost of intersections, roadways, and ramp improvements to the City of Shasta Lake. This includes the pro rata share of traffic signals, control stop signs, and road widening.

Shasta County Major Road Impact Fee Program

The City of Shasta Lake adopted Shasta County's Major Road Impact Fee Program when the city incorporated. While the City has not updated the list of projects contained in the program, the fee amount has been increased based on the consumer price index (CPI). Following is the roster of improvements in the City of Shasta Lake contained in the Major Road Impact Fee Program:

- Ashby Road: Realign and widen for two lanes and parking from Shasta Dam Boulevard to Central Valley High School.

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- Shasta Dam Boulevard: Install traffic signals in Central Valley.
- Old Oregon Trail: Reconstruct the freeway interchange.
- Cascade Boulevard: Widen for two lanes and parking from on existing alignment from Shasta Dam Boulevard to Pine Grove Avenue.
- Pine Grove Avenue: All new construction from Ashby Road to I-5.

City of Redding

The City of Redding currently maintains its General Plan Transportation Element (2000), which contains the following information of particular interest to this study:

Policy T1A: Establish the following peak-hour LOS standards for transportation planning and project review. They reflect the special circumstances of various areas of the community:

- *Use LOS "C" – for most arterial streets and their intersections.*
- *Use LOS "D" – for the Downtown area where vitality, activity, and pedestrian and transit use are primary goals.*
- *Use LOS "D" – for streets within the State highway system and interchanges.*
- *Use LOS "D" – for river-crossing street corridors whose capacity is affected by adjacent intersections.*

The City of Redding Capital Improvement Plan, updated January 2010, includes the following improvements at the study intersections/roadways:

- Twin View Boulevard Bridge Replacement: Replace aged Twin View Boulevard bridge over Churn Creek.
- North Redding Traffic Benefit District (NRTBD) Projects – Oasis Road Area: Project development of various projects in the NRTBD, including Oasis Road widening, Cascade Boulevard relocation, Oasis Road and I-5 interchange improvements, Twin View Boulevard relocation.
- Interstate 5 at Oasis Road Interchange Ramp Improvements: Construct southbound loop on-ramp and traffic signals at each ramp terminus.

Shasta County

Most of the roadways proposed with the project will be within and maintained by the City of Shasta Lake. However, Wonderland Boulevard is a County-maintained roadway that will be affected by the project. The Shasta County General Plan, as amended September 2004, sets forth future plans for the transportation system in the county. This document seeks to coordinate transportation planning in the cities of Shasta Lake, Anderson, and Redding, as well as in the unincorporated portions of the county, through the implementation of its goals and objectives. Policies and implementation programs pertaining to the county's circulatory system and the proposed project include:

- *Policy C-6k: Shasta County shall adopt the following LOS standards for considering any new roads: Rural arterial and collectors – LOS C*
- *Policy C-6l: New development which may result in exceeding LOS E on existing facilities shall demonstrate that all feasible methods of reducing travel demand have been attempted to reach LOS C. New development shall not be approved unless traffic impacts are adequately mitigated. Such mitigation may take the form of, but not limited to the following:*
- *Provision of capacity improvements to the specific road link to be impacted, the transit system, or any reasonable combination;*
- *Provision of demand reduction measures included as part of the project design or project operation or any feasible combination.*
- *Policy C11e: The County shall assess fees on new development to address the impact of additional development on the County's transportation system.*

The County of Shasta currently maintains a General Plan Circulation Element (2004), which contains the following information of particular interest to this project:

- Figure C-7 identifies the following functional classifications for the roads within the study area:
 - Old Oregon Trail – four-lane arterial
- Table RS-1 provides the following definitions and policies for the road classifications:
 - Arterial: Provides connections between links in the highway network and connects major destinations with the highway network; access from arterial to adjoining properties should be limited for safety and traffic efficiency. An arterial shall be considered a major thoroughfare. Curbside parking should be prohibited where feasible.
 - Collector: Accommodates traffic between principal arterial, arterial streets and/or activity centers. A collector shall be considered a major thoroughfare. Direct access to individual residential lots should be limited where feasible to improve traffic safety and efficiency.

4.3.3 IMPACTS AND MITIGATION MEASURES

STANDARDS OF SIGNIFICANCE

Based on Appendix G of the CEQA Guidelines, the City concludes that a project will have significant impacts on traffic and circulation if it does any of the following:

- Conflict with an applicable plan, ordinance, or policy establishing measures of effectiveness for the performance of the circulation system, taking into account all modes of transportation including mass transit and non-motorized travel and relevant components of the circulation system, including but not limited to intersections, streets, highways, and freeways, pedestrian and bicycle paths, and mass transit.

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- Conflict with an applicable congestion management program, including, but not limited to, level of service standards and travel demand measures, or other standards established by the county congestion management agency for designated roads or highways.
- Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks.
- Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment).
- Result in inadequate emergency access.
- Conflict with adopted policies, plans, or programs regarding public transit, bicycle, or pedestrian facilities, or otherwise decrease the performance or safety of such facilities.

As determined in the Initial Study prepared for the proposed project, implementation of the proposed project would not result in impacts associated with air traffic patterns. The nearest public use airport to the project site is Benton Airpark, which is located approximately 8 miles to the south. Therefore, this impact (Standard of Significance 3) will not be addressed further in this Draft EIR.

In addition to the thresholds of significance identified above, conditions with and without the project were compared to the following significance criteria for the appropriate jurisdiction in order to identify significant impacts specific to the project area.

SIGNIFICANCE THRESHOLD

The City of Shasta Lake does not define significance threshold criteria. Therefore, the following criteria (practiced by the City of Redding) have been utilized for study locations.

The following thresholds of significance are used to determine if an impact is significant and requires mitigation:

- Roadways/Signalized Intersections: The project is considered to have a significant effect if it would:
 - Result in a roadway or signalized intersection operating at an acceptable LOS under the base condition (no project) to deteriorate to an unacceptable LOS.
 - Increase the delay by more than 5 seconds at a signalized intersection that is operating/will operate at an unacceptable LOS without the project.
 - Increase the volume-to-capacity (V/C) ratio by more than 0.05 at a roadway segment that is operating/will operate at an unacceptable LOS without the project.
- Unsignalized Intersections: The project is considered to have a significant effect if it would:
 - Result in an unsignalized intersection movement/approach operating at an acceptable LOS under the base condition (no project) to an unacceptable LOS, and also cause the intersection to meet the peak-hour signal warrant.

- For an unsignalized intersection that meets the signal warrant, increase the delay by more than 5 seconds at a movement/approach that is operating at an unacceptable LOS without the project.

Timing and Funding for Mitigation

Some mitigation measures require physical improvements to the roadway or intersection in order to accommodate the project. The project's proportionate share of the improvement is identified in the analysis and can range from 100 percent project responsibility to a small fraction. As the City cannot require mitigation in excess of the impact(s) of the proposed project, the City will use the following criteria to determine when an improvement will be constructed and when a fee will be paid toward the improvement. The following criteria will be utilized for study locations within this study:

- If an intersection or roadway facility is significantly impacted by the proposed project for Near-Term conditions, and the project's pro rata share is equal to or above 25 percent, the project will be required to construct the necessary improvements.
- If an intersection or roadway facility is significantly impacted by the proposed project for Near-Term conditions, and the project's pro rata share is below 25 percent, the project will be required to pay its pro rata share of the cost of constructing these improvements.

The proposed project will be developed over several future phases that may include residential, nonresidential, and park features. Transportation and circulation impacts are directly related to occupancy of the future development. As shown above, the project's proportionate share of an improvement will determine whether the improvement is constructed or whether fees will be collected to address project impacts. Threshold events may be shown in the mitigation measure indicating at which point in the development (i.e., number of homes, square footage) the improvement must be operational. The City anticipates the need to adjust the timing of mitigation as individual projects are proposed.

METHODOLOGY

Since the preparation of the Traffic Impact Analysis Report in 2008, there have been a few minor adjustments to the project proposal as well as one other substantial development proposal and one other development approval in the vicinity of the project. (The Moody Flats Quarry project is pending approval from reviewing agencies, and the Shasta Wine Village project has been approved by Shasta County.) In consideration of these facts, City of Shasta Lake staff and consultants convened with representatives of Caltrans District 2, at which time it was agreed that the 2008 Traffic Impact Analysis Report would be updated to additionally consider the Interstate 5/Mountain Gate Boulevard interchange area accounting for the Moody Flats Quarry and Shasta Wine Village projects. This update is encapsulated within the 2012 technical memorandum, which updated the 2008 report with an analysis of only the following locations for Existing, Year 2020, and Year 2030 conditions:

- 1) Mountain Gate Road (Old Oregon Trail)/Wonderland Boulevard
- 2) Mountain Gate Road/I-5 Southbound Ramps
- 3) Mountain Gate Road/I-5 Northbound Ramps
- 4) Mountain Gate Road/Holiday Road

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The 2012 technical memorandum updated the 2008 Traffic Impact Analysis Report by solely focusing on traffic impacts at these locations for the various time periods. While this DEIR relies on the 2012 technical memorandum for the purpose of disclosing the potential effects to the above intersections, the 2008 Traffic Impact Analysis Report is still considered adequate (per Caltrans) regarding the identified environmental effects to all other project-affected traffic facilities.

The operations of roadway facilities are described with the term *level of service*. Level of service (LOS) is a qualitative description of traffic flow from the perspective of motorists based on factors such as speed, delay, freedom to maneuver, traffic volume, and the capacity of the roadway. Six levels are defined from LOS A, as the least congested operating conditions, to LOS F, or the most congested operating conditions. LOS E represents “at-capacity” operations. When volumes exceed capacity, stop-and-go conditions result and operations are designated as LOS F.

Because of the size and scope of the project, the impacts are discussed in the context of the City of Shasta Lake as well as areas that may partially or wholly be outside the City’s jurisdiction. As noted above, different agencies have different levels of service. The EIR identifies improvements regardless of agency jurisdiction; however, because the City does not have complete authority over the improvement(s), the DEIR must assume that another agency might not authorize the requisite improvement, thereby resulting in a significant and unavoidable impact as a result of the project. This is not to suggest that the City is ignoring the responsibility for the improvement, only that it lacks authority in constructing the improvement and must assume the worst possible case wherein the agency with jurisdiction either does not authorize the improvement or takes longer to make the improvement than assumed in the Draft EIR.

Roadway Segments

Roadway segments were analyzed by comparing the average daily traffic (ADT) volume to daily volume thresholds. **Table 4.3-9** displays the daily volume thresholds for various facility types. These thresholds are used as guidelines to identify the need for new or upgraded facilities. In general, intersection operations analysis provides a more realistic assessment of traffic conditions on a road than the roadway segment analysis.

TABLE 4.3-9
LEVEL OF SERVICE CRITERIA FOR ROADWAYS

Roadway Type	Average Daily Traffic (ADT) – Total of Both Directions				
	LOS A	LOS B	LOS C	LOS D	LOS E
6-Lane Expressway (high access control)	36,000	42,000	48,000	54,000	60,000
6-Lane Divided Arterial (with left turn lane)	32,000	38,000	43,000	49,000	54,000
4-Lane Expressway (high access control)	24,000	28,000	32,000	36,000	40,000
4-Lane Divided Arterial (with left turn lane)	22,000	25,000	29,000	32,500	36,000
4-Lane Undivided Arterial (no left turn lane)	18,000	21,000	24,000	27,000	30,000
2-Lane Arterial	11,000	12,500	14,500	16,000	18,000

Roadway Type	Average Daily Traffic (ADT) – Total of Both Directions				
	LOS A	LOS B	LOS C	LOS D	LOS E
(with left turn lane)					
2-Lane Arterial (no left turn lane)	9,000	10,500	12,000	13,500	15,000
4-Lane Collector	12,000	15,000	18,000	21,000	24,000
3-Lane Collector	9,000	11,250	13,500	15,750	18,000
2-Lane Collector	6,000	7,500	9,000	10,500	12,000
Residential Collector with frontage3	1,600	3,200	4,800	6,400	8,000
Residential3	600	1,200	2,000	3,000	4,500

Source: Omni-Means 2008

Notes:

1. Based on Highway Capacity Manual, 4th Edition (Transportation Research Board 2000).
2. All volume thresholds are approximate and assume ideal roadway characteristics. Actual thresholds for each LOS listed above may vary depending on a variety of factors, including (but not limited to) roadway curvature and grade, intersection or interchange spacing, driveway spacing, percentage of trucks and other heavy vehicles, lane widths, signal timing, on-street parking, volume of cross traffic and pedestrians, etc.

Intersections

Levels of service are calculated for all intersection control types using methods documented in the Transportation Research Board publication *Highway Capacity Manual 2000*. For two-way stop-controlled (TWSC) intersections, the “worst-case” movement delays and LOS are reported, computed based on the manual. For signalized intersections and all-way stop-controlled (AWSC) intersections, the intersection delays and LOS reported are average values for the whole intersection, computed based on the manual. The delay-based LOS criteria for different types of intersection control are outlined in **Table 4.3-10**.

TABLE 4.3-10
LEVEL OF SERVICE CRITERIA FOR INTERSECTIONS

LOS	Type of Flow	Delay	Maneuverability	Delay/Vehicle (sec)		
				Signalized (V/C)	Two-Way Stop	All-Way Stop
A	Stable Flow	Very slight delay. Progression is very favorable, with most vehicles arriving during the green phase not stopping at all.	Turning movements are easily made, and nearly all drivers find freedom of operation.	≤ 0.6	≤ 10.0	≤ 10.0
B	Stable Flow	Good progression and/or short cycle lengths. More vehicles stop than for LOS A, causing higher levels of average delay.	Vehicle platoons are formed. Many drivers begin to feel somewhat restricted within groups of vehicles.	> 0.6 & ≤ 0.7	> 10 & ≤ 15.0	> 10 & ≤ 15.0

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LOS	Type of Flow	Delay	Maneuverability	Delay/Vehicle (sec)		
				Signalized (V/C)	Two-Way Stop	All-Way Stop
C	Stable Flow	Higher delays resulting from fair progression and/or longer cycle lengths. Individual cycle failures may begin to appear at this level. The number of vehicles stopping is significant, although many still pass through the intersection without stopping.	Back-ups may develop behind turning vehicles. Most drivers feel somewhat restricted.	> 0.7 & ≤ 0.8	> 15 & ≤ 25.0	> 15 & ≤ 25.0
D	Approaching Unstable Flow	The influence of congestion becomes more noticeable. Longer delays may result from some combination of unfavorable progression, long cycle lengths, or high volume-to-capacity ratios. Many vehicles stop, and the proportion of vehicles not stopping declines. Individual cycle failures are noticeable.	Maneuverability is severely limited during short periods due to temporary back-ups.	> 0.8 & ≤ 0.9	> 25 & ≤ 35.0	> 25 & ≤ 35.0
E	Unstable Flow	Generally considered to be the limit of acceptable delay. Indicative of poor progression, long cycle lengths, and high volume-to-capacity ratios. Individual cycle failures are frequent occurrences.	There are typically long queues of vehicles waiting upstream of the intersection.	> 0.9 & ≤ 1.0	> 35 & ≤ 50.0	> 35 & ≤ 50.0
F	Forced Flow	Generally considered to be unacceptable to most drivers. Often occurs with over saturation. May also occur at high volume-to-capacity ratios. There are many individual cycle failures. Poor progression and long cycle lengths may also be major contributing factors.	Jammed conditions. Back-ups from other locations restrict or prevent movement. Volumes may vary widely, depending principally on the downstream back-up conditions.	> 1.0	> 50.0	> 50.0

Source: Transportation Research Board 2000

Freeway Ramp Merge/Diverge/Weave Analysis

Freeway mainline, ramp (merge/diverge) junction, and weaving operations have been analyzed using methodologies presented in the Highway Capacity Manual. The Transportation Research Board's Highway Capacity Software 2000, Version 4.1, was used in performing this analysis.

The merge/diverge/weave analysis is an assessment of operations that accounts for mainline operations (in addition to the operations of traffic entering and exiting the mainline). Therefore, this analysis is comprehensive enough to reflect capacity constraints on the freeway mainline (in addition to the merge/diverge/weave segment). The vehicle density-based LOS criteria used for freeway mainlines and freeway ramp merges and diverges are outlined in **Table 4.3-11** and **Table 4.3-12**, respectively.

TABLE 4.3-11
LEVEL OF SERVICE CRITERIA FOR BASIC FREEWAY SEGMENTS

LOS	Density (pc/mi/ln)
A	0–11
B	> 11–18
C	> 18–26
D	> 26–35
E	35–45
F	> 45

Source: Omni-Means 2008

TABLE 4.3-12
LEVEL OF SERVICE CRITERIA FOR RAMP MERGE AND DIVERGE AREAS

LOS	Density (pc/mi/ln)
A	≤ 10
B	> 10–20
C	> 20–28
D	> 28–35
E	> 35
F	Demand exceeds capacity

Source: Omni-Means 2008

Pedestrian, Bicycle, and Transit Analysis

Planned pedestrian, bicycle, and transit facilities within the proposed project were reviewed for consistency with the goals and policies contained in the following documents: City of Shasta Lake General Plan (1999), Shasta County General Plan (2004), City of Shasta Lake Park System Master Plan (2005), Shasta County Bikeway Plan (2010), and 2010 Regional Transportation Plan for Shasta County (SRTA 2010).

PROJECT TRIP DISTRIBUTION AND ASSIGNMENT

The directional trip distribution and assignment of project-generated trips were estimated based on the Shasta County Travel Demand Model and an understanding of existing and projected future traffic flows and travel patterns in the vicinity of the project site and the location of local and regional housing and employment/commercial centers in relation to the proposed project site. The trip distribution assumptions were approved by City of Shasta Lake staff. **Figures 4.3-4a** and **4.3-4b** show the anticipated directional trip distribution for the proposed residential development, while **Figures 4.3-5a** and **4.3-5b** show the anticipated directional trip distribution for the proposed commercial development. Note that these figures depict the trip distribution characteristics with the proposed southerly extension in place. As will be noted later, access to the project site for Near-Term conditions would be entirely off Mountain Gate Boulevard. Hence, for Near-Term conditions, the trip distribution would be the same as that shown in **Figures 4.3-4a**,

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4.3-4b, 4.3-5a, and 4.3-5b, but all of the project traffic would be assigned to Mountain Gate Boulevard.

Near-Term Trip Generation

The preparation of the Traffic Impact Analysis Report for the project occurred in 2008 and identified Near-Term conditions as occurring in the Year 2010. However, since preparation of the report, several years have passed, over which time a few minor adjustments to the project have been proposed and one other substantial development proposal and one other development approval in the vicinity of the project have occurred. In consideration of these facts, City of Shasta Lake staff and consultants convened with representatives of Caltrans District 2, at which time it was agreed that the Omni-Means 2008 Traffic Impact Analysis Report would be updated to additionally consider the Interstate 5/Mountain Gate Boulevard interchange area accounting for the Moody Flats Quarry and Shasta Wine Village projects. This update is encapsulated within the Omni-Means 2011 technical memorandum, which updated the Traffic Impact Analysis Report. Therefore, Near-Term conditions are considered to represent current conditions (2013) through the Year 2015.

Due to the relatively smaller amount of development for Near-Term conditions, project site trip generation for Near-Term conditions has been estimated using trip generation rates contained in the Institute of Transportation Engineers (ITE) (2003) publication *Trip Generation* and in accordance with the trip generation methodology proposed by the City. "Single-family detached housing" bearing ITE use code 210, "apartment" with ITE use code 220, and "townhouse" bearing use code 230 were used to estimate the trips from the residential component of the project. "General office building" bearing code 720 and "shopping center" with code 820 were used to estimate trips from professional office and commercial space, respectively. Fitted curve equations were used for office, shopping center, and townhouse land uses, while average rates were used for single-family detached housing and apartment land uses to establish trip generation for the proposed project.

As shown in **Table 4.3-13**, it is estimated that the portion of the proposed project assumed to be in place under Near-Term conditions would generate 3,329 weekday daily trips, 219 of which would occur during the AM peak hour and 398 of which would occur during the PM peak hour.

TABLE 4.3-13
NEAR-TERM PROJECT TRIP GENERATION

ITE Land Use Category (ITE Code)	Unit	Daily Trip	Weekday AM Peak Rate/Unit			Weekday PM Peak Rate/Unit		
		Rate Unit	Total	In	Out	Total	In	Out
General Office Building (710)1	Per KSF	31.20	4.00	88%	12%	32.80	17%	83%
Shopping Center (820)1	Per KSF	193.80	5.20	61%	39%	17.40	48%	52%
Single-Family Detached Housing (210)	Per DU	9.57	0.75	25%	75%	1.01	63%	37%
Apartment (220)	Per DU	6.72	0.51	20%	80%	0.62	65%	35%
Land Use Description	Quantity	Daily Trips	Weekday AM Peak-Hour Trips			Weekday PM Peak-Hour Trips		
			Total	In	Out	Total	In	Out
Professional Office	2.5	78	10	9	1	82	14	68

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Commercial	5	969	26	16	10	87	42	45
Total Commercial – Before Pass-By		969	26	16	10	87	42	45
Commercial – 15% Pass-By for Daily		145						
Commercial – 25% Pass-By for Peak Periods			6	4	2	21	10	11
Commercial (After-Pass-By)2		824	20	12	8	66	31	35
Single-Family Residential	208	1,991	156	39	117	210	132	78
Multi-Family Residential	65	437	33	7	27	40	26	14
Total Trips		3,329	219	67	153	398	207	195

Source: Omni-Means 2008

Notes: KSF = 1,000 square feet; DU = dwelling unit

¹ The ITE descriptions for general office building and shopping center are included in Appendix 4.3-1.

² Refer to Appendix 4.3-1 for more information on pass-by.

As shown in **Table 4.3-14**, it is estimated that complete buildout of the proposed Mountain Gate at Shasta project will generate 19,424 weekday daily trips, 1,680 of which would occur during the AM peak hour and 1,835 of which would occur during the PM peak hour.

TABLE 4.3-14
BUILDOUT PROJECT TRIP GENERATION

Land Use Description	Unit	Daily Trip Rate Unit	Weekday AM Peak Rate/Unit			Weekday PM Peak Rate/Unit		
			Total	In	Out	Total	In	Out
Professional Office	Per KSF	10.73	1.20	83%	17%	1.27	21%	79%
Retail	Per KSF	51.63	3.37	60%	40%	4.65	41%	59%
Park	Per KSF	83.38	7.81	71%	29%	7.25	38%	62%
Single-Family – Residential	Per Acre	8.63	0.87	28%	72%	0.83	68%	32%
Multi-Family – Residential	Per DU	7.80	0.81	28%	72%	0.76	68%	32%
Land Use Description	Quantity	Daily Trips	Weekday AM Peak-Hour Trips			Weekday PM Peak-Hour Trips		
			Total	In	Out	Total	In	Out
Professional Office	15	161	18	15	3	19	4	15
Retail	220	11,359	742	442	300	1,024	423	601
Park	16	1,334	125	89	36	116	44	72
Single-Family – Residential	1,042	8,992	910	251	659	869	593	276
Multi-Family – Residential	416	3,244	337	96	241	316	214	102
Total Project Trips		25,090	2,132	893	1,239	2,344	1,278	1,066
Internal Project Trips								
Professional Office		31	3	3	0	3	0	3
Retail		2,200	117	70	47	227	94	133
Park		298	25	18	7	26	10	16
Single-Family – Residential		1,607	185	53	132	113	76	37

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Multi-Family – Residential	614	60	17	43	60	40	20
<i>Total Internal Project Trips</i>	<i>4,750</i>	<i>390</i>	<i>161</i>	<i>229</i>	<i>429</i>	<i>220</i>	<i>209</i>
External Project Trips							
Professional Office	130	15	12	3	16	4	12
Retail	9,159	625	372	253	797	329	468
Park	1,036	100	71	29	90	34	56
Single-Family – Residential	7,385	725	198	527	756	517	239
Multi-Family – Residential	2,630	277	79	198	256	174	82
<i>Total Internal Project Trips</i>	<i>20,340</i>	<i>1,742</i>	<i>732</i>	<i>1,010</i>	<i>1,915</i>	<i>1,058</i>	<i>857</i>
Pass-By/Diverter Link Trips							
Commercial – 10% Pass-By	916	62	37	25	80	33	47
Total Pass-By	916	62	37	25	80	33	47
<i>Net New Project Trip Generation</i>	<i>19,424</i>	<i>1,680</i>	<i>695</i>	<i>985</i>	<i>1,835</i>	<i>1,025</i>	<i>810</i>

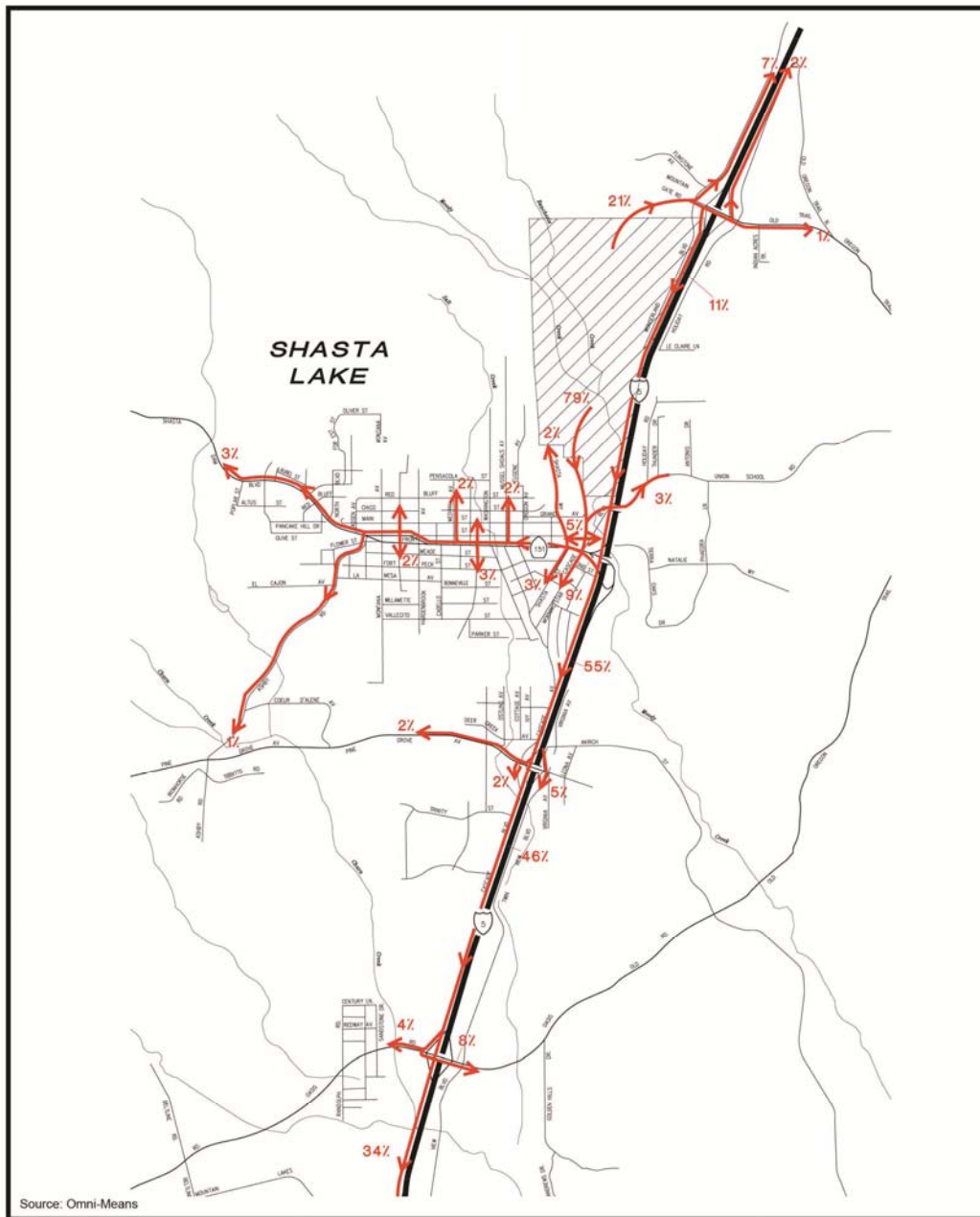
Source: Omni-Means 2008

Project Site Access

For Near-Term conditions, access to the entire project site would be via a southerly extension of Wonderland Boulevard, which currently ties into Mountain Gate Boulevard.

For Cumulative Year 2020 and Cumulative Year 2030 conditions, which assume full buildout of the project site, access to the project site would be via two access points:

- Access to Mountain Gate Boulevard would be via the southerly extension of Wonderland Boulevard (similar to Near-Term conditions).
- Additionally, the southerly extension of Wonderland Boulevard would extend farther, eventually tying into Cascade Boulevard in the south.

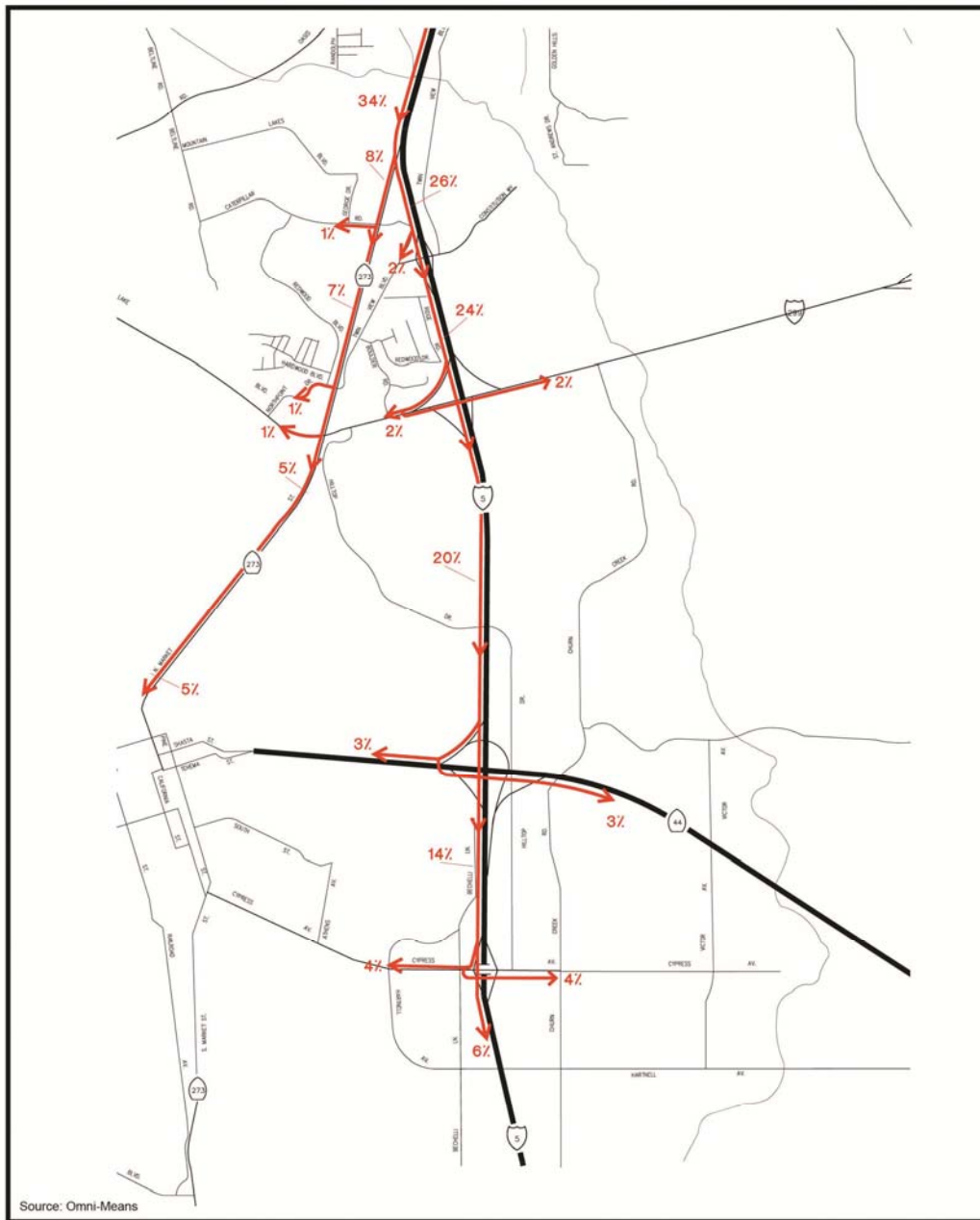


Source: Omni-Means
N
NOT TO SCALE

Figure 4.3-4a
Residential Trip Distributions - Northern Section
Mountain Gate at Shasta

PMC

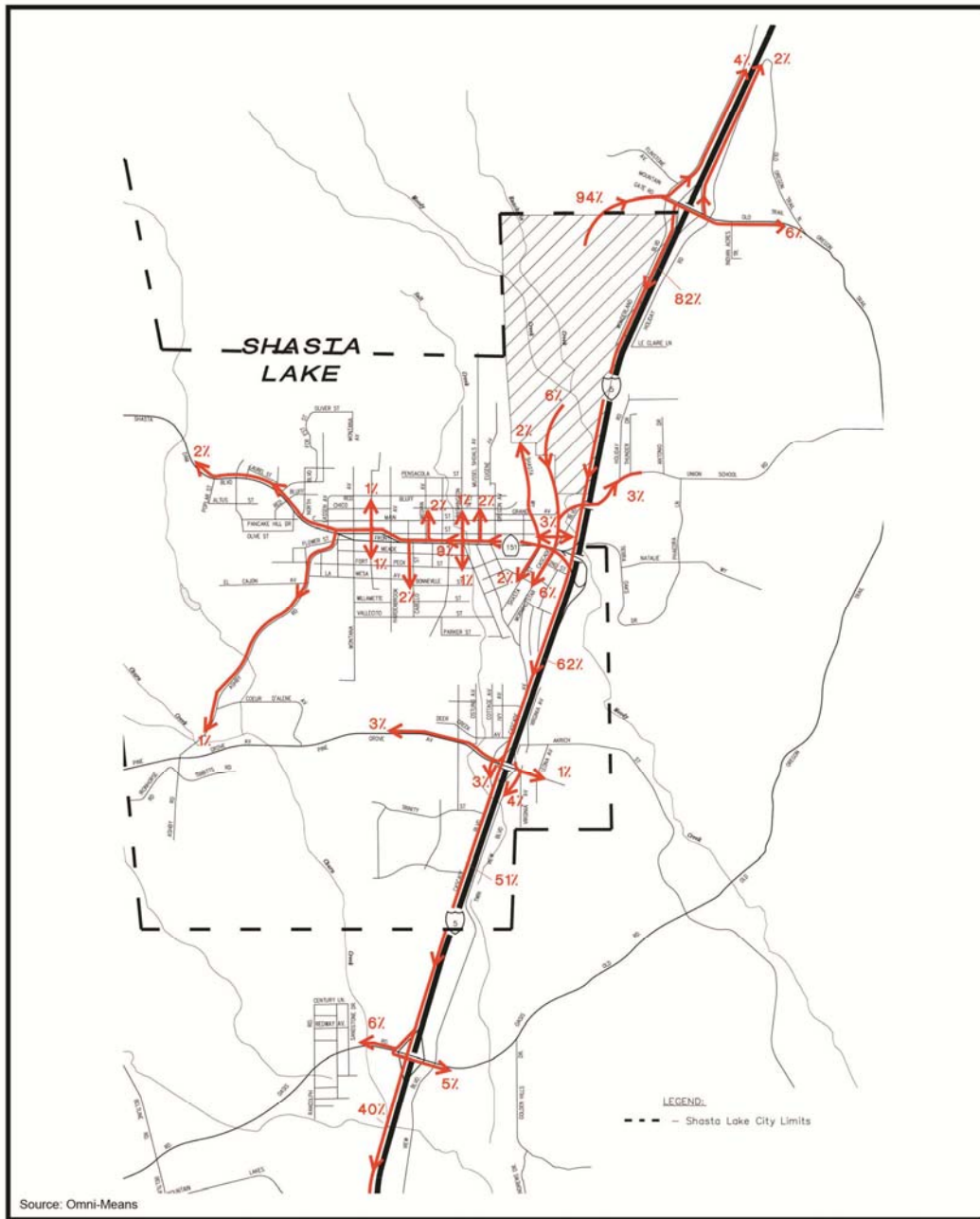
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N
NOT TO SCALE

Figure 4.3-4b
Residential Trip Distributions - Southern Section
Mountain Gate at Shasta

PMC



NOT TO SCALE

Figure 4.3-5a
Commercial Trip Distributions - Northern Section
Mountain Gate at Shasta

PMC

4.3 TRANSPORTATION AND CIRCULATION

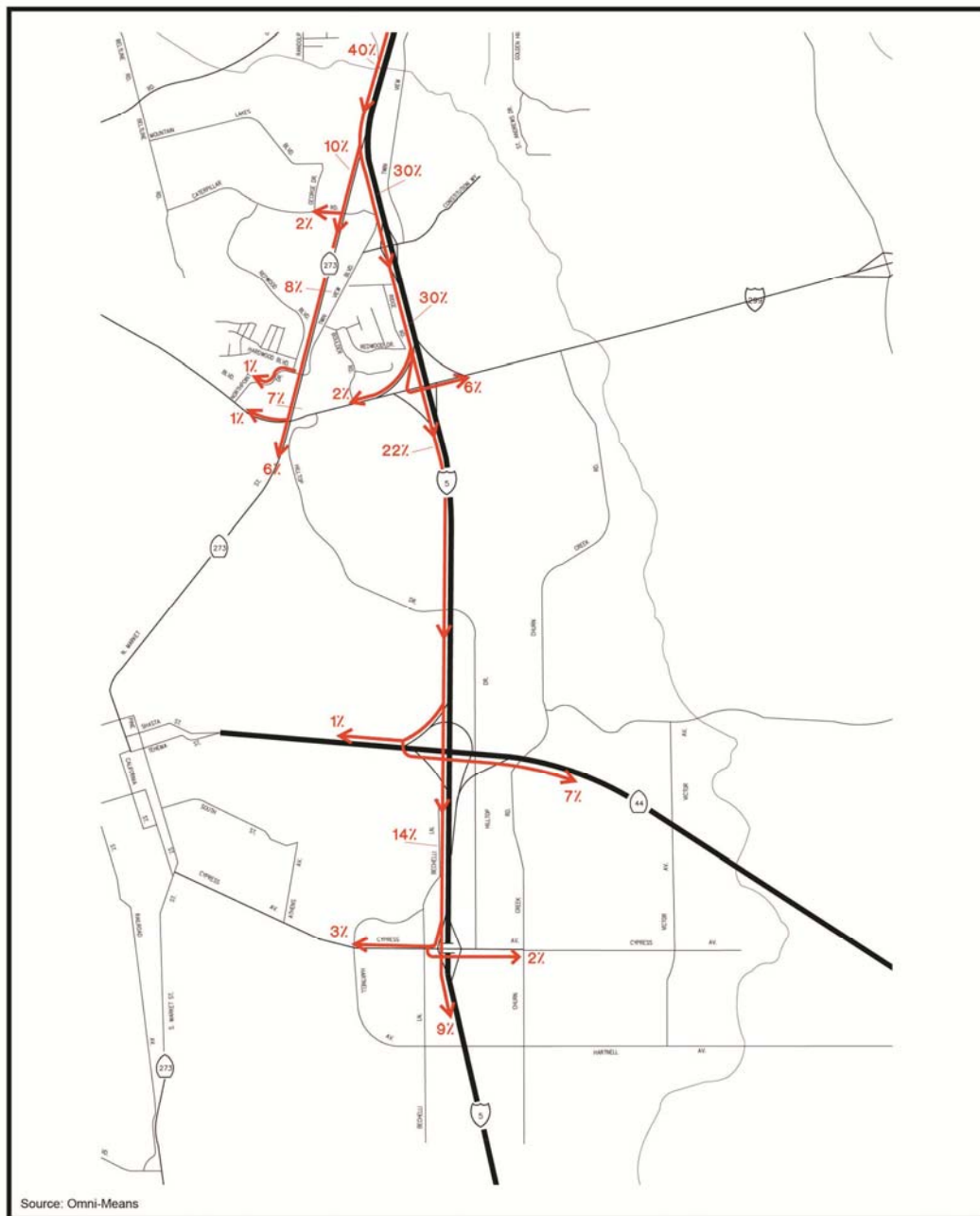


Figure 4.3-5b
Commercial Trip Distributions - Southern Section
Mountain Gate at Shasta

PMC

IMPACTS AND MITIGATION MEASURES

Conflict with Applicable Intersection Level of Service – Near-Term Plus Project Conditions (Standards of Significance 1 and 2)

Impact 4.3.1 Under Near-Term Plus Project conditions, all study area intersections would meet level of service standards with the imposition of mitigation. However, six study intersections are wholly outside the City of Shasta Lake's jurisdiction, and the City cannot be certain that mitigation will be made. Therefore, this impact would be **significant**.

Near-Term Plus Project conditions were simulated by superimposing traffic generated by the proposed project onto Near-Term No Project intersection traffic volumes. Near-Term Plus Project peak-hour intersection traffic operations were analyzed using derived Near-Term Plus Project peak-hour intersection traffic volumes shown in **Table 4.3-15**.

TABLE 4.3-15
PEAK-HOUR INTERSECTION LOS RESULTS – NEAR-TERM PLUS PROJECT CONDITIONS

#	Intersection	Control Type	Near-Term No Project				Near-Term Plus Project			
			AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour	
			Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS
1	Wonderland Boulevard/Mt. Gate Rd	AWSC	9.7	A	8.6	A	11.8	B	13.4	B
2	Mt. Gate Rd/I-5 SB Ramps	TWSC	9.4	A	10.5	B	10.1	B	12.3	B
3	Mt. Gate Rd/I-5 NB Ramps	TWSC	12.0	B	10.0	A	14.8	B	16.1	C
4	Mt. Gate Rd/ Holiday Rd	TWSC	10.6	B	10.0	A	10.6	B	10.1	B
5	SR 151/Ashby Rd	TWSC	12.5	B	11.9	B	12.6	B	12.1	B
6	SR 151 (WB)/ Montana Ave	TWSC	14.0	B	14.3	B	14.1	B	14.7	B
7	SR 151 (EB)/ Montana Ave	TWSC	16.0	C	13.6	B	16.1	C	13.9	B
8	SR 151/Median Ave	TWSC	24.7	C	27.4	D	25.5	D	30.8	D
9	Mussel Shoals Ave/ Red Bluff St	AWSC	7.1	A	7.2	A	7.1	A	7.3	A
10	Mussel Shoals Ave/ Main St	AWSC	7.2	A	7.4	A	7.3	A	7.5	A
11	SR 151/Mussels Shoals Ave	TWSC	29.6	D	109.1	F	30.8	D	135.8	F
12	Shasta Way/Front St	TWSC	9.8	A	9.8	A	9.8	A	9.8	A
13	SR 151/Shasta St	TWSC	621.5	F	471.7	F	697.2	F	654.0	F
14	SR 151/Cascade Boulevard	Signal	27.1	C	21.1	C	27.3	C	21.6	C
15	SR 151/I-5 SB Off-Ramp	Signal	10.5	B	11.2	B	10.5	B	11.2	B
16	Lake Boulevard/ Pine Grove Ave	TWSC	16.8	B	24.0	B	17.0	B	24.4	B
17	Pine Grove Ave/ Ashby Rd	TWSC	16.9	C	13.5	C	16.9	C	13.5	C
18	Pine Grove Ave/ Cascade Boulevard	TWSC	39.5	E	163.0	F	42.6	E	193.1	F

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#	Intersection	Control Type	Near-Term No Project				Near-Term Plus Project			
			AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour	
			Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS
19	Pine Grove Ave/ 1-5 SB Ramps	TWSC	11.0	B	15.7	C	11.0	B	15.9	C
20	Pine Grove Ave/I-5 NB Ramps	TWSC	14.5	B	28.8	D	14.6	B	32.9	D
21	Pine Grove Ave/ Twin View Blvd	TWSC	10.5	B	10.9	B	10.5	B	10.9	B
22	Oasis Rd/Cascade Blvd	TWSC	64.0	F	88.7	F	67.2	F	95.8	F
23	Oasis Rd/I-5 SB Ramps	TWSC	Ovr	F	757.8	F	Ovr	F	839.6	F
24	Oasis Rd/I-5 NB Ramps	TWSC	413.0	F	799.2	F	431.5	F	847.3	F
25	Oasis Rd/Twin View Blvd	TWSC	58.6	F	215.8	F	60.1	F	228.8	F
26	SR 273/Caterpillar Rd	Signal	32.1	C	31.2	C	32.1	C	31.2	C
27	SR 273/Northpoint Dr	Signal	16.4	B	19.0	B	16.5	B	19.2	B
28	SR 273/Lake Blvd (SR 299)	Signal	29.1	C	35.4	D	29.3	C	35.7	D
29	SR 299/I-5 SB Ramps	Signal	10.6	B	16.1	B	10.8	B	16.3	B
30	SR 299/I-5 NB Ramps	Signal	20.1	C	19.2	B	20.9	C	19.2	B
31	Cypress Ave/ Bechelli Lane	Signal	17.9	B	32.9	C	18.4	B	33.0	C
32	Cypress Ave/I-5 SB Ramps	Signal	22.8	C	47.1	D	23.0	C	51.1	D
33	Cypress Ave/I-5 NB Ramps	Signal	29.5	C	55.6	E	45.5	D	57.7	D
34	Cypress Ave/ Hilltop Dr	Signal	29.4	C	38.5	D	29.4	C	38.8	D

Source: Omni-Means 2008

Notes: Intersections 1–28 have a defined acceptable LOS of C. Intersections 29–37 have a defined acceptable LOS of D. Mountain Gate Road is also known as Old Oregon Trail. Ovr = Overflow of Condition.

The proposed project is considered to have a significant impact to signalized intersections if it would (1) result in a signalized intersection operating at an acceptable LOS under the Near-Term No Project condition to deteriorate to an unacceptable LOS; or (2) increase the delay by more than 5 seconds at a signalized intersection that is operating/will operate at an unacceptable LOS without the project.

The proposed project is considered to have a significant impact to unsignalized intersections if it would (1) result in an unsignalized intersection movement/approach currently operating at an acceptable LOS to deteriorate to an unacceptable LOS and/or also cause the intersection to meet the peak-hour signal warrant; or (2) for an unsignalized intersection that meets the peak-hour signal warrant, increase the delay by more than 5 seconds at the movement/approach that is operation at an unacceptable LOS without the project.

Based on a comparison of LOS between the Near-Term No Project conditions and the Near-Term Plus Project conditions, seven intersections were found to operate unacceptably for Near-Term No Project conditions (**Table 4.3-15**), yet would experience an increase in delay of more than 5 seconds with the addition of project traffic and are therefore considered to result in potentially significant impacts. One additional intersection, which was found to operate acceptably for Near-Term No Project conditions, would experience a reduction to an unacceptable level of service with the addition of project traffic and is therefore considered a potentially significant impact. In total, eight study intersections would experience potentially significant impacts under Near-Term Plus Project conditions. These intersections are as follows:

- Intersection number 8, SR 151/Median Avenue (AM peak hour)
- Intersection number 11, SR 151/Mussel Shoals Avenue (PM peak hour), also identified as below an acceptable level of service in the existing condition

- Intersection number 13, SR 151/Shasta Street (AM and PM peak hour) also identified as below an acceptable level of service in the existing condition
- Intersection number 18, Pine Grove Avenue/Cascade Boulevard (PM peak hour) also identified as below an acceptable level of service in the existing condition
- Intersection number 22, Oasis Road/Cascade Boulevard (PM peak hour) also identified as below an acceptable level of service in the existing condition
- Intersection number 23, Oasis Road/I-5 SB Ramps (AM and PM peak hour) also identified as below an acceptable level of service in the existing condition
- Intersection number 24, Oasis Road/I-5 NB Ramps (AM and PM peak hour)
- Intersection number 25, Oasis Road/Twin View Boulevard (PM peak hour)

Because the project results in mitigation, or participation in the mitigation of 17 different intersections, all of the mitigation measures have been included in a single location in this Draft EIR. This is different than the other sections where mitigation measures follow each impact statement, but is intended to simplify the section and make the mitigation strategy easier for the reader to understand.

Mitigation Measures

MM 4.3.1a The following intersection improvements shall be completed prior to occupancy of the 50th housing unit, or earlier if directed by the City of Shasta Lake Fire Marshal:

- **Shasta Dam Boulevard/Shasta Way** (Intersection #5) – Remove the existing median on Shasta Dam Boulevard at Shasta Way/Street. Construct a right turn lane on westbound Shasta Dam Boulevard. Construct two left turn lanes on westbound and eastbound Shasta Dam Boulevard at the intersection of Shasta Way/Street. Signalize the intersection of Shasta Dam Boulevard and Shasta Way/Street.
- **Shasta Dam Boulevard/Mussel Shoals Avenue** (Intersection #13) – Construct a traffic signal.
- **Shasta Dam Boulevard/Median Avenue** (Intersection #6) – Construct a traffic signal.

MM 4.3.1b The following intersection improvements shall be completed prior to occupancy of the 400th housing unit, or approximately one-half of the proposed project, or earlier if directed by the City of Shasta Lake Fire Marshal:

- **Old Oregon Trail/Wonderland Boulevard** (Intersection #1) – Construct a roundabout or traffic signal.
- **Old Oregon Trail/I-5 NB Ramp** (Intersection #2) – Construct a roundabout or traffic signal.

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- **Shasta Dam Boulevard/Cascade Boulevard** (Intersection #15) – Construct a right turn lane on westbound Shasta Dam Boulevard at Cascade Boulevard. Construct a second left turn lane on eastbound Shasta Dam Boulevard at Cascade Boulevard. Construct a second left turn lane on southbound Cascade Boulevard at Shasta Dam Boulevard.
- **Shasta Dam Boulevard/I-5 SB Ramp** – Convert eastbound through lane to a shared through right turn lane. Widen on-ramp to add a second lane to the on-ramp 1,000 feet long.

MM 4.3.1c

The proposed project shall pay its proportionate share of the cost of the following improvements:

- **Pine Grove Avenue/Twin View Boulevard** (Intersection #21) – Pay fee equal to 14 percent of the cost to relocate the intersection west of its current location. The relocated intersection shall include east- and westbound through, left, and right turn lanes. The intersection shall include north- and southbound through and left turn lanes. Construct a traffic signal.
- **Pine Grove Avenue/I-5 NB Ramps** (Intersection #20) – Pay fee equal to 14 percent of the cost of installing a traffic signal and a right turn lane on the northbound off-ramp.
- **Pine Grove Avenue/I-5 SB Ramps** (Intersection #19) – Pay fee equal to 9 percent of the cost to install a traffic signal.
- **Pine Grove Avenue/Cascade Boulevard** (Intersection #18) – Pay fee equal to 7 percent of the cost to realign the south leg of Cascade Boulevard to align with the existing signalized intersection. The south leg of intersection shall include northbound through, right, and left turn lanes and a southbound through lane.
- **Pine Grove Avenue/Ashby Road** (Intersection #17) – Pay a fee equal to 17 percent of the cost to install an all-way stop sign or traffic signal.
- **Pine Grove Avenue/Lake Boulevard** (Intersection #16) – Pay a fee equal to 15 percent of the cost to install an all-way stop sign or traffic signal.
- **Oasis Road/Twin View Boulevard** (Intersection #25) – Pay a fee equal to 4 percent of the cost to relocate the intersection east of its current location. The intersection shall include two left turn lanes on west and eastbound Oasis Road at Twin View Boulevard and a right turn lane on southbound Twin View Boulevard at Oasis Road.
- **Oasis Road/I-5 NB Ramps** (Intersection #24) – Pay a fee equal to 5 percent of the project's proportionate share of the traffic signal and north and eastbound turn lane improvements.
- **Oasis Road/I-5 SB Ramps** (Intersection #23) – Pay a fee equal to 4 percent of the cost to construct a westbound left turn lane and to modify the traffic signal.

- **Oasis Road/Cascade Boulevard** (Intersection #22) – Pay a fee equal to 3 percent of the cost to relocate the intersection west of its current location and construct a traffic signal. Intersection improvements shall include in the west and eastbound directions one left, three through, and one right turn lane; in the northbound direction one left, one right, and one through turn lane; and in the southbound direction two left, one through, and one right turn lane.

MM 4.3.1d The extension of Wonderland Boulevard to Cascade Boulevard shall be constructed prior to occupancy of the 50th housing unit, or earlier if directed by the City of Shasta Lake Fire Marshal.

Timing/Implementation: Implemented prior to occupancy as noted in the mitigation measure. Fees shall be collected at building permit issuance.

Enforcement/Monitoring: City of Shasta Lake Development Services Department

Under the Near-Term condition, the improvements shown in mitigation measures **MM 4.3.1a** and **MM 4.3.1c** will result in the operation of the study intersections at acceptable levels of service. Mitigation measure **MM 4.3.1c** requires that the proposed project pay its proportionate share of improvement costs for those study intersections that already function unacceptably and where the proposed project does not result in 25 percent or more of proportionate responsibility. While the City will continue to collect funds from other development in the area and may seek other funding, the City cannot be certain that the fees charged to the proposed project will result in the improvements at these intersections during the Near-Term condition. Therefore, these impacts remain **significant and unavoidable**.

Some of the intersections contained in mitigation measures **MM 4.3.1a**, **MM 4.3.1b**, and **MM 4.3.1c** are partially or wholly outside the City of Shasta Lake's jurisdiction (see **Table 4.3-2** for a listing of intersection by jurisdiction). While the City will require the proposed project to either make the identified improvement or pay the appropriate proportionate share of the cost of improvements, and will hold the fees until requested by the jurisdiction, the City cannot be certain that the other agencies will permit the improvement and therefore must assume that the impacts could remain. As a result, impacts to all of the intersections that are outside the City's jurisdiction are considered **significant and unavoidable** because the City cannot be certain that improvements will be made consistent with this Draft EIR.

Conflict with Applicable Roadway Level of Service – Near-Term Plus Project Conditions (Standards of Significance 1 and 2)

Impact 4.3.2 Following implementation of the proposed project, all study area roadway segments would meet level of service standards. Therefore, this impact would be **less than significant**.

Near-Term Plus Project conditions along roadway segments were analyzed by comparing derived average daily trip (ADT) volumes projected to be generated by the project to the corresponding ADT-based level of service thresholds (see **Table 4.3-1**) for roadway type assumed for the Near-Term No Project condition. **Table 4.3-16** displays the LOS analysis results for key roadway segments with implementation of the proposed project.

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TABLE 4.3-16
PEAK-HOUR ROADWAY LOS RESULTS – NEAR-TERM PLUS PROJECT CONDITIONS

Roadway	Capacity Configuration	Near-Term No Project Conditions		Near-Term Plus Project Conditions	
		Average Daily Traffic Volumes	LOS	Average Daily Traffic Volumes	LOS
Shasta Dam Boulevard – Between North Boulevard and Ashby Road	2-Lane Undivided Arterial	7,040	A	7,070	A
Ashby Road – Between Fort Peck Street and Flower Street	2-Lane Collector	4,280	A	4,420	A
Montana Avenue – Between Main Street and Front Street	2-Lane Collector	1,410	A	1,520	A
Red Bluff Street – Between Washington Avenue and Grand River Avenue	Residential	400	A	450	A
Main Street – Between Washington Avenue and Grand River Avenue	Residential	540	A	610	B
Mussel Shoals Avenue – Between Front Street and Shasta Dam Boulevard (SR 151)	Residential Collector with Frontages	1,390	A	1,660	B
Grand Coulee Boulevard – Between Fort Peck Street and Shasta Dam Boulevard (SR 151)	2-Lane Collector	2,550	A	2,570	A
Pine Grove Avenue – Between Lake Boulevard and Ashby Road	2-Lane Undivided Arterial	5,350	A	5,390	A
Cascade Boulevard – Between Pine Grove Avenue and Deer Creek Avenue	2-Lane Undivided Arterial	3,910	A	4,080	A
Pine Grove Avenue – West of Cascade Boulevard	2-Lane Undivided Arterial	5,490	A	5,530	A
SR 273 – Between Twin View Boulevard and Lake Boulevard	4-Lane Divided Arterial	12,320	A	12,850	A

Source: Omni-Means 2008

Notes: The proposed project is considered to have a significant impact to roadways if it would (1) result in a roadway segment to operate at an acceptable LOS under the Near-Term No Project condition to deteriorate to an unacceptable LOS; or (2) increase the delay by more than 5 seconds at a roadway segment that is operating/will operate at an unacceptable LOS without the project.

As shown, all of the study area roadway segments are projected to operate at an acceptable LOS B or better after implementation of the proposed project under Near-Term conditions. This impact is therefore **less than significant**.

Mitigation Measures

None required.

Conflict with Applicable Freeway Mainline Segments Level of Service – Near-Term Plus Project Conditions (Standards of Significance 1 and 2)

Impact 4.3.3 Implementation of the proposed project would result in an increase in traffic volumes on vicinity freeways that would operate below level of service thresholds under Near-Term Plus Project conditions. While the imposition of

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mitigation would reduce this impact, vicinity freeways are wholly outside the City of Shasta Lake's jurisdiction, and the City cannot be certain that mitigation will be made. Therefore, this impact would be **significant**.

Near-Term Plus Project mainline I-5 operations were evaluated utilizing the peak-hour volumes shown in **Table 4.3-17**.

TABLE 4.3-17
FREEWAY MAINLINE LOS RESULTS – NEAR-TERM PLUS PROJECT CONDITIONS

Freeway Mainline Segment	Number of Lanes	Target LOS	AM Peak Hour			PM Peak Hour		
			Volume	Density (pc/mi/ln)	LOS	Volume	Density (pc/mi/ln)	LOS
I-5 NB, south of Cypress Avenue Interchange	2	D	3,340	38.6	E	3,928	Ovr	F
I-5 SB, south of Cypress Avenue Interchange	2	D	3,428	41.0	E	2,943	30.5	D
I-5 NB, north of Cypress Avenue Interchange	3	D	3,592	27.1	D	4,368	37.4	E
I-5 SB, north of Cypress Avenue Interchange	3	D	3,822	29.6	D	3,022	22.1	C
I-5 NB, north of SR 44 Interchange	2	D	3,143	34.2	D	3,940	Ovr	F
I-5 SB, north of SR 44 Interchange	2	D	3,550	44.9	E	2,912	30.0	D
I-5 NB, north of SR 299 Interchange	2	D	2,551	25.1	C	3,089	33.1	D
I-5 SB, north of SR 299 Interchange	2	D	2,773	28.0	D	2,381	23.2	C
I-5 NB, north of Twin View Boulevard Interchange	2	D	2,251	21.8	C	2,763	27.8	D
I-5 SB, north of Twin View Boulevard Interchange	2	D	2,366	23.0	C	2,115	20.4	C
I-5 NB, north of SR 273 Interchange	3	D	2,729	17.8	B	3,395	22.3	C
I-5 SB, north of SR 273 Interchange	3	D	2,899	18.9	C	2,572	16.8	B
I-5 NB, north of Oasis Road Interchange	3	D	2,162	15.3	B	2,636	18.6	C
I-5 SB, north of Oasis Road Interchange	3	D	2,294	16.2	B	2,067	14.6	B
I-5 NB, north of Pine Grove Avenue Interchange	3	C	1,917	14.1	B	2,266	16.5	B
I-5 SB, north of Pine Grove Avenue	3	C	2,006	14.6	B	1,862	13.6	B

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Freeway Mainline Segment	Number of Lanes	Target LOS	AM Peak Hour			PM Peak Hour		
			Volume	Density (pc/mi/ln)	LOS	Volume	Density (pc/mi/ln)	LOS
I-5 NB, north of SR 151 Interchange	2	C	1,421	15.6	B	1,705	18.8	C
I-5 SB, north of SR 151 Interchange	2	C	1,490	16.7	B	1,390	15.4	B
I-5 NB, north of Mountain Gate Boulevard Interchange	2	C	1,240	13.7	B	1,417	15.6	B
I-5 SB, north of Mountain Gate Boulevard Interchange	2	C	1,233	13.6	B	1,145	12.6	B

Source: Omni-Means 2008

Notes: Bolded entries indicate segments operating at unacceptable LOS. The proposed project is considered to have a significant impact to freeway mainline segments if it would (1) result in a freeway mainline segment operating at an acceptable LOS under the Near-Term No Project condition to deteriorate to an unacceptable LOS; or (2) increase the density at a freeway mainline segment that is operating/will operate at an unacceptable LOS without the project.

According to the Traffic Impact Analysis Report (Omni-Means 2008), based on a comparison of the Near-Term No Project condition and the Near-Term Plus Project condition for freeway mainline level of service, five mainline segments were found to operate unacceptably for Near-Term No Project conditions and would continue to operate at an unacceptable level of service with the addition of Near-Term Plus Project traffic with a slight increase in the density. These freeway mainline segments include:

- I-5 NB, south of Cypress Avenue Interchange
- I-5 SB, south of Cypress Avenue Interchange
- I-5 NB, north of Cypress Avenue Interchange
- I-5 NB, north of SR 44 Interchange
- I-5 NB, north of SR 44 Interchange

Improvements to Interstate 5 designed to increase vehicle capacity by adding travel lanes are included in the Shasta Metropolitan Improvement Program adopted by the Shasta Regional Transportation Agency in 2011. Improvements to the Mountain Gate interchange with I-5 are included in the existing Major Road Impact Fee Program, adopted by Shasta County prior to the incorporation of the City of Shasta Lake. After incorporation, the City continues to be part of the program.¹ The City collects fees at the time of building issuance and works with the County to fund projects subject to the fee.

Table 4.3-18 identifies the improvements proposed to expand mainline capacity.

¹ When the Major Impact Fee Program was prepared, the Mountain Gate interchange was identified in Table 4 as Old Oregon Trail, named after the roadway that crosses Interstate 5.

TABLE 4.3-18
INTERSTATE 5 MAINLINE IMPROVEMENTS REQUIRED BY PROJECT BUILDOUT

Improvements	LOS with Mitigation	Environmental Determination
To ensure that I-5 operates at an acceptable LOS in the study area, the following improvements are required: - The addition of a through lane at the I-5 Northbound On-Ramp merge junction of the I-5/Cypress Avenue Interchange for Year 2020 and Year 2030 conditions. - The addition of a northbound mainline segment at I-5 and SR 44 – Northbound Connector from westbound SR 44 for Near-Term, Year 2020, and Year 2030 conditions. - Addition of a collector-distributor ramp configuration (Interchange Type L-10) I-5 and SR 44 SB Connector to WB 44, SB Connector to EB 44 for Near-Term, Year 2020, and Year 2030 conditions. - Provision of a new overpass to Twin View Boulevard at the I-5 Northbound On-Ramp merge junction of the SR 273/I-5 Interchange. - Addition of a two-lane on-ramp with a 1,000-foot-long auxiliary lane at I-5 Southbound On-Ramp merge junction of the SR 151/I-5 Interchange.	C	Less than significant

Mitigation Measures

MM 4.3.3

The project applicants/developer(s) shall contribute a fair share amount for all needed improvements to State facilities as shown in Table 4.3-18 or other facilities as mutually agreed upon by Caltrans and the City of Shasta Lake, or as identified in subsequent traffic studies for impacts both within the City of Shasta Lake and outside the City of Shasta Lake. The fair share contribution shall be determined by the City of Shasta Lake based on the traffic study or subsequent traffic monitoring studies required of the developer. The fair share calculation shall also be determined and verified in consultation with the Shasta County Regional Transportation Planning Agency, which includes Shasta County and the City of Redding. This mechanism will ensure that the collected mitigation funds will be spent on the measures identified in the TIS or on alternative improvements that will reduce the project's impacts to regional transportation.

Timing/Implementation: *Implemented prior to approval of subsequent tentative maps for residential development or a site plan for nonresidential development*

Enforcement/Monitoring: *City of Shasta Lake Development Services Department*

Mitigation measure **MM 4.3.3** would improve the level of service at all freeway mainline segments to acceptable levels under Near-Term Plus Project conditions. However, I-5 is wholly outside the jurisdiction of the City of Shasta Lake, which does not have the ability to construct improvements on I-5 or on any facility in Caltrans' jurisdiction. Because improvement to State-owned facilities is entirely outside the City's control, the DEIR must assume that the improvements may not be constructed and that impacts would then remain significant and unavoidable. This has the unfortunate result of appearing that the impacts of the project are being ignored by the City of Shasta Lake, which is not the case. Mitigation measure **MM 4.3.3** shows that the City is

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requiring the project to contribute toward freeway mainline improvements, and the existing impact fee program contributes toward the interchange improvement. Yet because I-5 is wholly outside the City of Shasta Lake's jurisdiction, the City cannot be certain that improvements will be made consistent with this DEIR. If the improvement cannot be constructed, the impact is not fully mitigated, and the agency can only conclude that the impact is **significant and unavoidable**.

Conflict with Applicable Ramp Junction Level of Service – Near-Term Plus Project Conditions (Standards of Significance 1 and 2)

Impact 4.3.4 Implementation of the proposed project would result in an increase in traffic volumes on vicinity freeway ramp junctions that would operate below level of service thresholds under Near-Term Plus Project conditions. While the imposition of mitigation would reduce this impact, vicinity freeway ramp junctions are wholly outside the City of Shasta Lake's jurisdiction, and the City cannot be certain that mitigation will be made. Therefore, this impact would be **significant**.

Near-Term Plus Project ramp merge/diverge operations were evaluated utilizing the peak-hour volumes shown in **Table 4.3-19**.

TABLE 4.3-19
NEAR-TERM PLUS PROJECT RAMP MERGE DIVERGE LOS

I-5 & Cypress Avenue	Junction Type	Target LOS	AM Peak Hour			PM Peak Hour		
			Volume	Density (pc/mi/ln)	LOS	Volume	Density (pc/mi/ln)	LOS
I-5 NB On-Ramp	Merge	D	741	22.5	C	1,027	28.4	D
I-5 SB Off-Ramp	Diverge	D	1,102	29.5	D	900	25.5	C
I-5 & SR 44	Junction Type	Target LOS	AM Peak Hour			PM Peak Hour		
			Volume	Density (pc/mi/ln)	LOS	Volume	Density (pc/mi/ln)	LOS
I-5 NB Loop On-Ramp	Merge	D	529	30.6	D	592	38.0	F
I-5 NB Direct On-Ramp	Merge	D	354	23.1	C	673	28.3	D
I-5 SB Direct Off-Ramp	Diverge	D	763	45.5	F	731	38.1	E
I-5 SB Loop Off-Ramp	Diverge	D	408	45.5	F	398	38.1	E
I-5 & SR 273	Junction Type	Target LOS	AM Peak Hour			PM Peak Hour		
			Volume	Density (pc/mi/ln)	LOS	Volume	Density (pc/mi/ln)	LOS
I-5 NB On-Ramp	Merge	D	274	24.5	C	553	31.3	D
I-5 SB Off-Ramp	Diverge	D	534	27.7	C	393	25.2	C
I-5 & Oasis Road	Junction Type	Target LOS	AM Peak Hour			PM Peak Hour		
			Volume	Density (pc/mi/ln)	LOS	Volume	Density (pc/mi/ln)	LOS
I-5 NB On-Ramp	Merge	D	165	19.2	B	204	22.2	C

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I-5 SB Off-Ramp	Diverge	D	183	22.8	C	219	21.3	C
I-5 & SR 151	Junction Type	Target LOS	AM Peak Hour			PM Peak Hour		
			Volume	Density (pc/mi/ln)	LOS	Volume	Density (pc/mi/ln)	LOS
I-5 NB Off-Ramp	Diverge	C	613	22.0	C	380	23.4	C
I-5 NB On-Ramp	Merge	C	180	15.2	B	153	17.1	B
I-5 SB Off-Ramp	Diverge	C	63	22.4	C	150	21.2	C
I-5 SB On-Ramp	Diverge	C	819	22.5	C	580	19.2	B
I-5 & Mountain Gate Boulevard	Junction Type	Target LOS	AM Peak Hour			PM Peak Hour		
			Volume	Density (pc/mi/ln)	LOS	Volume	Density (pc/mi/ln)	LOS
I-5 NB Off-Ramp	Diverge	C	265	21.5	C	380	23.4	C
I-5 NB On-Ramp	Merge	C	46	19.2	B	89	21.5	C
I-5 SB Off-Ramp	Diverge	C	29	19.3	B	313	16.9	B
I-5 SB On-Ramp	Merge	C	388	18.8	B	313	16.9	B

Source: Omni-Means 2008

Notes: Bolded entries indicate segments operating at unacceptable LOS. The proposed project is considered to have a significant impact to ramp junctions if it would (1) result in a ramp junction operating at an acceptable LOS under the Near-Term No Project condition to deteriorate to an unacceptable LOS; or (2) increase the density at a ramp junction that is operating/will operate at an unacceptable LOS without the project.

According to the Traffic Impact Analysis Report (Omni-Means 2008), based on a comparison of the Near-Term No Project condition and the Near-Term Plus Project condition for ramp junction level of service, one ramp junction, the I-5 and SR 44 ramp junction, was found to operate unacceptably for Near-Term No Project conditions and would continue to operate at an unacceptable level of service with the addition of Near-Term Plus Project traffic with a slight increase in the density.

The additional I-5 northbound mainline segment and collector distributor ramp configuration described in **Table 4.3-18** would provide acceptable LOS for this ramp junction under Near-Term Plus Project conditions. While mitigation measure **MM 4.3.3** requires the project applicant to contribute its fair-share fee to vehicle capacity improvements on Interstate 5, I-5 is wholly outside the jurisdiction of the City of Shasta Lake, which does not have the ability to construct improvements on I-5 or on any facility in Caltrans' jurisdiction. The DEIR must assume that the improvements are not constructed and the impacts remain significant and unavoidable. The City is requiring that the project contribute toward I-5 improvements. Yet because I-5 is wholly outside the City of Shasta Lake's jurisdiction, the City cannot be certain that improvements will be made consistent with this DEIR. If the improvement cannot be constructed, the impact is not fully mitigated, and the agency can only conclude that the impact is **significant and unavoidable**.

Mitigation Measures

Payment of fair-share contributions as described in mitigation measure **MM 4.3.3**.

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Substantially Increase Traffic Hazards Due to Design Features or Incompatible Uses (Standard of Significance 4)

Impact 4.3.5 Implementation of the proposed project would not result in increased traffic hazards. This is a **less than significant** impact.

The City of Shasta Lake implements subdivision standards designed to ensure standard engineering practices are used for all improvements. New development allowed within the Area Plan would include new streets, access points, pathways, and other circulation improvements that would be checked for compliance with these standards as part of the entitlement process conducted by the City. Improvements to the transportation and circulation system within and surrounding the Area Plan would be implemented over time. All such improvements would be designed and constructed to local, regional, and federal standards, and as such, would not be expected to introduce any hazardous design features.

In addition, the level of service for the internal circulation of the Area Plan has been analyzed in the Traffic Impact Analysis Report (Omni-Means 2008) prepared for the project. Analysis of the internal intersections is presented in **Table 4.3-20**.

TABLE 4.3-20
PROJECT INTERNAL INTERSECTION LOS – BUILDOUT

Intersection	Control Type	Target LOS	AM Peak Hour			PM Peak Hour		
			Delay	LOS	Warrant Met?	Delay	LOS	Warrant Met?
INT 1	RA	C	4.9	A	no	4.9	A	no
INT 2	RA	C	4.1	A	no	4.5	A	no
INT 3	TWSC	C	10.6	B	no	10.2	B	no
INT 4	TWSC	C	10.2	B	no	10.5	B	no
INT 5	TWSC	C	9.9	A	no	10.0	A	no
INT 6	TWSC	C	8.7	A	no	8.7	A	no
INT 7	TWSC	C	9.2	A	no	9.7	A	no
INT 8	TWSC	C	10.7	B	no	10.8	B	no
INT 9	TWSC	C	10.2	B	no	10.6	B	no
INT 10	TWSC	C	8.6	A	no	8.6	A	no
INT 11	TWSC	C	11.1	B	no	11.5	B	no
INT 12	TWSC	C	8.9	A	no	8.9	A	no
INT 13	TWSC	C	9.1	A	no	9.1	A	no
INT 14	TWSC	C	13.2	B	no	13.6	B	no
INT 15	TWSC	C	10.0	A	no	9.5	A	no
INT 16	TWSC	C	14.0	B	no	14.3	B	no
INT 17	TWSC	C	11.5	B	no	10.4	B	no

Source: Omni-Means 2008

Notes: **Bolded** entries indicate segments operating at unacceptable LOS. TWSC = two-way stop control; AWSC = all-way stop control; RA = roundabout; Warrant = Caltrans' peak-hour volume-based signal warrant

As shown in **Table 4.3-20**, all of the internal intersections are projected to operate at an acceptable level of service for the control and geometrics. Therefore, the project will not increase hazards or the safety of residents, and this impact is considered **less than significant**.

Mitigation Measures

None required.

Adequate Emergency Access (Standard of Significance 5)

Impact 4.3.6 The Area Plan designates new streets that would provide connectivity within the Area Plan, creating new routes for all users, including emergency response providers. This impact is considered to be **potentially significant**.

The project proposes main access points off Wonderland Boulevard and Cascade Boulevard onto streets designed to City standards. Once constructed, the streets would provide adequate access for emergency vehicles entering the site. The applicant has indicated that phasing of development may result in construction at the north end of the project site, which might delay the construction of the roadway. The Fire Department will require two points of ingress and egress prior to occupancy of the 50th housing unit, or earlier if significant nonresidential development occurs. Until specific development plans are proposed, there is only one access point to the project site for emergency vehicles. Mitigation measure **MM 4.3.6** requires that a secondary access be provided prior to occupancy of the 50th housing unit. The secondary access needs to meet the standards of emergency services for an all-weather surface and reduces this impact to **less than significant**.

Mitigation Measures

MM 4.3.6 An all-weather surface roadway connection suitable for emergency vehicle ingress and egress shall be constructed between Cascade Boulevard and Wonderland Boulevard.

Timing/Implementation: *Implemented prior to occupancy of the 50th housing unit, or earlier if directed by the City of Shasta Lake Fire Marshal*

Enforcement/Monitoring: *City of Shasta Lake Development Services Department*

Conflict with Adopted Policies, Plans, or Programs Regarding Public Transit, Bicycle, or Pedestrian Facilities (Standard of Significance 6)

Impact 4.3.7 The proposed project would not conflict with adopted policies, plans, or programs supporting alternative transportation (e.g., bus turnouts, bicycle racks). **No impact** would occur.

Shasta Lake General Plan Policy C-c requires that new neighborhoods provide pedestrian-dedicated facilities, and Policy C-f requires the provision of bicycle facilities. As stated in Section 3.0, Project Description, an internal circulation system, in the form of roads and trails, would link all of the uses in the Area Plan. The system has been designed to encourage walking, biking, and other non-motorized uses. The trails would be located along biologically important areas, such as drainages and wetlands, as well as at the base of slopes. The proposed trails would be

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separated from roadways in some areas of the project site and adjacent to roadways in others. The Area Plan contains a schematic trail plan, a typical trail design section, and policies that require trail linkages for all land uses (see **Figure 3.0-4**). Policies in the Area Plan require that subsequent development connect to and extend any existing trail system. Therefore, **no impact** would occur in terms of alternative transportation.

Mitigation Measures

None required.

4.3.4 CUMULATIVE SETTING, IMPACTS, AND MITIGATION MEASURES

CUMULATIVE SETTING

The cumulative setting for traffic and circulation consists of traffic generated by all existing and future (cumulative) development in the project area. For the purposes of this analysis, the planning horizon for future traffic condition considers cumulative conditions in the Year 2020 and the Year 2030.

Planned/Programmed Improvements – Intersections

The City of Redding approved the Oasis Road Specific Plan Master EIR in 2006, which analyzed operations on Oasis Road and other facilities in the vicinity of the project site. **Figure 4.3-6** shows the baseline lane geometrics and control assumed for Cumulative (Year 2020 and Year 2030) conditions for intersections analyzed along the Oasis Road corridor.

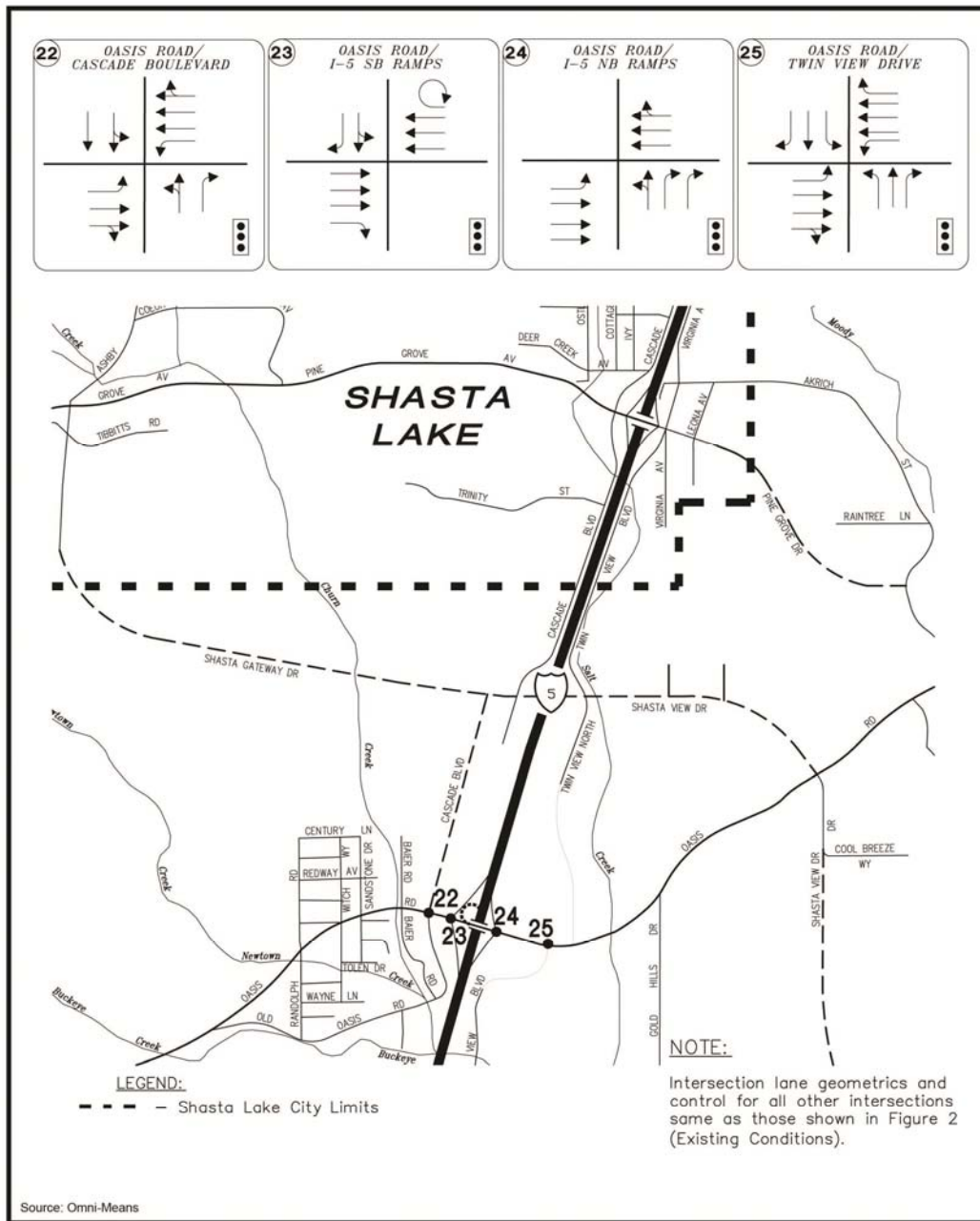


Figure 4.3-6
 Cumulative (Year 2020 & 2030) Conditions - Lane Geometrics & Control
 Mountain Gate at Shasta

PMC

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Cumulative Year 2020 Background Traffic Volume Forecasts

Year 2020 conditions are assumed as those that would exist in the Year 2020 consistent with land use assumptions included in the latest version of the Shasta County Travel Demand Model. Year 2020 No Project conditions assume that the Mountain Gate at Shasta project would remain undeveloped (i.e., a “vacant” project site) through Year 2020, and Year 2020 model land uses are assumed elsewhere. Year 2020 Plus Project conditions were then simulated by superimposing the proposed project-generated traffic on the Year 2020 No Project traffic volumes. While construction of the project is anticipated to be phased and buildout may take between 10 and 20 years, the Year 2020 Plus Project conditions assume full buildout of the proposed project in order to provide a conservative analysis.

The traffic volumes for the Year 2020 analysis were derived from the January 2007 version of the Shasta County Travel Demand Model. The Travel Demand Model for the Year 2020 includes the land use information for projects that City of Shasta Lake staff anticipate to be completed by 2020. The difference of the volumes for Year 2020 and Year 2004 (Calibrated Year) as obtained from the Travel Demand Model were added to the existing volumes to obtain the Year 2020 No Project volumes. The 2020 Plus Project volumes were obtained by adding project traffic to the 2020 No Project volumes.

To assess the impacts of the Mountain Gate at Shasta project on the study intersections and roadways, the following 2020 scenarios were analyzed:

- Year 2020 No Project conditions
- Year 2020 Plus Project conditions

Cumulative Year 2020 No Project Traffic Operations

Table 4.3-21 provides a summary of the resulting Year 2020 No Project intersection level of service.

TABLE 4.3-21
PEAK-HOUR INTERSECTION LOS RESULTS – YEAR 2020 NO PROJECT CONDITIONS

#	Intersection	Control Type	Target LOS	AM Peak Hour			PM Peak Hour		
				Delay	LOS	Warrant Met?	Delay	LOS	Warrant Met?
1	Wonderland Blvd/Mt. Gate Rd	AWSC	C	10.0	A	--	9.2	A	--
2	Mt. Gate Rd/I-5 SB Ramps	TWSC	C	13.0	B	--	12.7	B	--
3	Mt. Gate Rd/I-5 NB Ramps	TWSC	C	13.7	B	--	11.8	B	--
4	Mt. Gate Rd/Holiday Rd	TWSC	C	12.8	B	--	12.2	B	--
5	SR 151/Ashby Rd	TWSC	C	15.3	C	no	13.8	B	no
6	SR 151 (WB)/Montana Ave	TWSC	C	14.5	B	no	15.2	C	no
7	SR 151 (EB)/Montana Ave	TWSC	C	18.1	C	no	14.2	B	no
8	SR 151/Median Ave	TWSC	C	28.5	D	no	29.4	D	no
9	Mussel Shoals Ave/Red Bluff St	AWSC	C	7.1	A	no	7.2	A	no

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#	Intersection	Control Type	Target LOS	AM Peak Hour			PM Peak Hour		
				Delay	LOS	Warrant Met?	Delay	LOS	Warrant Met?
10	Mussel Shoals Ave/Main St	AWSC	C	7.2	A	no	7.4	A	no
11	SR 151/Mussels Shoals Ave	TWSC	C	34.1	D	no	111.8	F	no
12	Shasta Way/Front St	TWSC	C	10.3	B	no	10.2	B	no
13	SR 151/Shasta St	TWSC	C	Ovr	F	yes	Ovr	F	yes
14	SR 151/Cascade Boulevard	Signal	C	26.0	C	--	20.8	C	--
15	SR 151/I-5 SB Off-Ramp	Signal	C	9.3	A	--	9.3	A	--
16	Lake Boulevard/Pine Grove Ave	TWSC	C	17.4	C	no	23.5	C	no
17	Pine Grove Ave/Ashby Rd	TWSC	C	17.0	C	no	19.9	C	no
18	Pine Grove Ave/Cascade Blvd	TWSC	C	184.5	F	no	1,012.7	F	no
19	Pine Grove Ave/I-5 SB Ramps	TWSC	C	13.5	B	no	31.4	D	no
20	Pine Grove Ave/I-5 NB Ramps	TWSC	C	24.1	C	no	185.6	F	yes
21	Pine Grove Ave/Twin View Blvd	TWSC	C	13.8	B	no	14.7	B	no
22	Oasis Rd/Cascade Blvd	TWSC	C	38.7	D	--	40.9	D	--
23	Oasis Rd/I-5 SB Ramps	TWSC	C	6.7	A	--	10.9	B	--
24	Oasis Rd/I-5 NB Ramps	TWSC	C	17.6	B	--	32.7	C	--
25	Oasis Rd/Twin View Blvd	TWSC	C	26.8	C	--	29.7	C	--
26	SR 273/Caterpillar Rd	Signal	D	31.0	C	--	26.4	C	--
27	SR 273/Northpoint Dr	Signal	D	16.2	B	--	21.2	C	--
28	SR 273/Lake Blvd (SR 299)	Signal	D	32.0	C	--	26.4	C	--
29	SR 299/I-5 SB Ramps	Signal	D	13.1	C	--	19.9	B	--
30	SR 299/I-5 NB Ramps	Signal	D	20.8	C	--	21.4	C	--
31	Cypress Ave/Bechelli Lane	Signal	C	25.8	C	--	31.1	C	--
32	Cypress Ave/I-5 SB Ramps	Signal	D	22.5	C	--	58.5	E	--
33	Cypress Ave/I-5 NB Ramps	Signal	D	27.7	C	--	47.2	D	--
34	Cypress Ave/Hilltop Dr	Signal	C	20.1	C	--	30.0	C	--

Source: Omni-Means 2008

Notes: Bolded entries indicate intersections operating at unacceptable LOS. TWSC = two-way stop control; AWSC = all-way stop control; Warrant = Caltrans' peak-hour volume-based signal warrant. Delay in seconds. Mountain Gate Road also known as Old Oregon Trail.

As shown in **Table 4.3-21**, the following intersections are projected to operate at an unacceptable level of service during at least one peak-hour period:

- SR 151/Median Avenue
- SR 151/Mussel Shoals Avenue
- SR 151/Shasta Street (would meet the warrant)

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- Pine Grove Avenue/Cascade Boulevard
- Pine Grove Avenue/I-5 SB Ramps
- Pine Grove Avenue/I-5 NB Ramps (would meet the warrant)
- Oasis Road/Cascade Boulevard
- Cypress Avenue/I-5 SB Ramps

Roadway Segments

Year 2020 No Project daily traffic operations along roadway segments were analyzed by comparing derived Year 2020 No Project ADT volumes to the ADT-based level of service thresholds that correspond to the roadway type assumed for Year 2020 No Project conditions following implementation of planned improvements as described earlier. **Table 4.3-22** contains a summary of the Year 2020 No Project roadway segment LOS conditions.

TABLE 4.3-22
ROADWAY LOS RESULTS – YEAR 2020 NO PROJECT CONDITIONS

Roadway	Capacity Configuration	Average Daily Traffic Volumes	LOS
Shasta Dam Boulevard – Between North Boulevard and Ashby Road	2-Lane Undivided Arterial	8,480	A
Ashby Road – Between Fort Peck Street and Flower Street	2-Lane Collector	4,780	A
Montana Avenue – Between Main Street and Front Street	2-Lane Collector	1,450	A
Red Bluff Street – Between Washington Avenue and Grand River Avenue	Residential	460	A
Main Street – Between Washington Avenue and Grand River Avenue	Residential	570	A
Mussel Shoals Avenue – Between Front Street and Shasta Dam Boulevard (SR 151)	Residential Collector with Frontages	1,880	A
Grand Coulee Boulevard – Between Fort Peck Street and Shasta Dam Boulevard (SR 151)	2-Lane Collector	2,650	A
Pine Grove Avenue – Between Lake Boulevard and Ashby Road	2-Lane Undivided Arterial	5,590	A
Cascade Boulevard – Between Pine Grove Avenue and Deer Creek Avenue	2-Lane Undivided Arterial	4,510	A
Pine Grove Avenue – West of Cascade Boulevard	2-Lane Undivided Arterial	6,000	A
SR 273 – Between Twin View Boulevard and Lake Boulevard	4-Lane Divided Arterial	16,000	A

Source: Omni-Means 2008

As indicated in **Table 4.3-22**, all of the study segments would operate at an acceptable level of service on a daily basis for Year 2020 No Project conditions.

Freeway Mainline Segments

Year 2020 No Project mainline operations were evaluated utilizing the peak-hour volumes shown in **Table 4.3-23**.

TABLE 4.3-23
FREEWAY MAINLINE LOS RESULTS – YEAR 2020 NO PROJECT CONDITIONS

Freeway Mainline Segment	Number of Lanes	Target LOS	AM Peak Hour			PM Peak Hour		
			Volume	Density (pc/mi/ln)	LOS	Volume	Density (pc/mi/ln)	LOS
I-5 NB, south of Cypress Avenue Interchange	2	D	3,839	37.7	E	4,556	Ovr	F
I-5 SB, south of Cypress Avenue Interchange	2	D	3,990	41.2	E	3,643	34.0	D
I-5 NB, north of Cypress Avenue Interchange	3	D	3,895	24.8	C	4,785	33.4	D
I-5 SB, north of Cypress Avenue Interchange	3	D	4,425	29.4	D	3,953	25.3	C
I-5 NB, north of SR 44 Interchange	2	D	3,673	34.5	D	4,794	Ovr	F
I-5 SB, north of SR 44 Interchange	2	D	4,388	Ovr	F	3,671	34.5	D
I-5 NB, north of SR 299 Interchange	2	D	3,179	27.5	D	3,931	39.8	E
I-5 SB, north of SR 299 Interchange	2	D	3,558	32.6	D	3,153	27.2	D
I-5 NB, north of Twin View Boulevard Interchange	2	D	2,815	23.6	D	3,422	30.6	D
I-5 SB, north of Twin View Boulevard Interchange	2	D	3,119	26.8	D	2,852	24.7	C
I-5 NB, north of SR 273 Interchange	3	D	3,419	19.2	C	4,107	23.3	C
I-5 SB, north of SR 273 Interchange	3	D	3,805	21.4	C	3,431	19.3	C
I-5 NB, north of Oasis Road Interchange	3	D	2,470	15.0	B	2,979	18.1	C
I-5 SB, north of Oasis Road Interchange	3	D	2,621	15.9	B	2,376	14.4	B
I-5 NB, north of Pine Grove Avenue Interchange	3	C	2,241	14.3	B	2,411	15.1	B
I-5 SB, north of Pine Grove Avenue	3	C	2,195	13.8	B	2,217	14.0	B

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Freeway Mainline Segment	Number of Lanes	Target LOS	AM Peak Hour			PM Peak Hour		
			Volume	Density (pc/mi/ln)	LOS	Volume	Density (pc/mi/ln)	LOS
I-5 NB, north of SR 151 Interchange	2	C	1,655	15.9	B	1,719	16.3	B
I-5 SB, north of SR 151 Interchange	2	C	1,551	15.0	B	1,565	14.9	B
I-5 NB, north of Mountain Gate Boulevard Interchange	2	C	1,526	13.6	B	1,577	14.1	B
I-5 SB, north of Mountain Gate Boulevard Interchange	2	C	1,428	12.8	B	1,463	13.1	B

Source: Omni-Means 2008

Notes: Bolded entries indicate segments operating at unacceptable LOS.

As shown in **Table 4.3-23**, the following mainline segments are projected to operate at unacceptable LOS conditions at least during one peak-hour period:

- I-5 NB, south of Cypress Avenue interchange
- I-5 SB, south of Cypress Avenue interchange
- I-5 NB, north of SR 44 interchange
- I-5 SB, north of SR 44 interchange
- I-5 NB, north of SR 299 interchange

Ramp Junctions

Year 2020 No Project ramp merge/diverge operations were evaluated utilizing the peak-hour volumes shown in **Table 4.3-24**.

TABLE 4.3-24
RAMP MERGE DIVERGE LOS – YEAR 2020 NO PROJECT CONDITIONS

I-5 & Cypress Avenue	Junction Type	Target LOS	AM Peak Hour			PM Peak Hour		
			Volume	Density (pc/mi/ln)	LOS	Volume	Density (pc/mi/ln)	LOS
I-5 NB On-Ramp	Merge	D	676	31.7	D	959	39.5	F
I-5 SB Off-Ramp	Diverge	D	1,239	29.1	D	1,096	27.9	C
I-5 & SR 44	Junction Type	Target LOS	AM Peak Hour			PM Peak Hour		
			Volume	Density (pc/mi/ln)	LOS	Volume	Density (pc/mi/ln)	LOS
I-5 NB Loop On-Ramp	Merge	D	555	30.5	D	748	38.8	F

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I-5 NB Direct On-Ramp	Merge	D	446	23.3	C	863	29.8	D
I-5 SB Direct Off-Ramp	Diverge	D	794	48.1	F	749	41.0	E
I-5 SB Loop Off-Ramp	Diverge	D	660	40.2	E	543	33.5	D
I-5 & SR 273	Junction Type	Target LOS	AM Peak Hour			PM Peak Hour		
			Volume	Density (pc/mi/ln)	LOS	Volume	Density (pc/mi/ln)	LOS
I-5 NB On-Ramp	Merge	D	399	24.9	C	605	32.1	F
I-5 SB Off-Ramp	Diverge	D	688	27.7	C	515	25.3	C
I-5 & Oasis Road	Junction Type	Target LOS	AM Peak Hour			PM Peak Hour		
			Volume	Density (pc/mi/ln)	LOS	Volume	Density (pc/mi/ln)	LOS
I-5 NB On-Ramp	Merge	D	302	15.0	B	405	18.1	B
I-5 SB Off-Ramp	Diverge	D	335	19.4	B	391	18.1	B
I-5 & SR 151	Junction Type	Target LOS	AM Peak Hour			PM Peak Hour		
			Volume	Density (pc/mi/ln)	LOS	Volume	Density (pc/mi/ln)	LOS
I-5 NB Off-Ramp	Diverge	C	688	18.6	B	914	20.2	C
I-5 NB On-Ramp	Merge	C	179	11.1	B	123	10.3	B
I-5 SB Off-Ramp	Diverge	C	48	17.2	B	111	17.3	B
I-5 SB On-Ramp	Diverge	C	924	16.9	B	707	14.9	B
I-5 & Mountain Gate Boulevard	Junction Type	Target LOS	AM Peak Hour			PM Peak Hour		
			Volume	Density (pc/mi/ln)	LOS	Volume	Density (pc/mi/ln)	LOS
I-5 NB Off-Ramp	Diverge	C	214	22.0	C	213	22.5	C
I-5 NB On-Ramp	Merge	C	39	20.0	B	53	20.4	C
I-5 SB Off-Ramp	Diverge	C	19	19.3	B	40	19.6	B
I-5 SB On-Ramp	Merge	C	256	17.2	B	180	16.8	B

Source: Omni-Means 2008

Notes: Bolded entries indicate segments operating at unacceptable LOS.

As indicated in **Table 4.3-24**, the following ramp merge/diverge junctions are projected to operate at unacceptable LOS conditions at least during one peak-hour period:

- I-5 and Cypress Avenue – NB On-Ramp
- I-5 and SR 44 – NB Loop On-Ramp, SB Direct Off-Ramp, SB Loop Off-Ramp
- I-5 and SR 273 – NB On-Ramp

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Year 2030 Background Traffic Volume Forecasts

Year 2030 conditions are assumed as those that would exist in the Year 2030 consistent with land use assumptions included in the latest version of the Shasta County Travel Demand Model with changes. Year 2030 No Project conditions assume that the Mountain Gate at Shasta project would remain undeveloped (i.e., a “vacant” project site) through the Year 2030, and Year 2030 model land uses are assumed elsewhere. Year 2030 Plus Project conditions were then simulated by superimposing the proposed project-generated traffic on the Year 2030 No Project traffic volumes. The Year 2030 Plus Project conditions assume full buildout of the proposed Mountain Gate at Shasta project.

The traffic volumes for the Year 2030 analysis were derived from the January 2007 version of the Shasta County Travel Demand Model. The land use and resulting trip generation information for the proposed Mountain Gate at Shasta project was included in the Travel Demand Model for Year 2030 conditions. Trips from the proposed project were “zeroed out,” which resulted in Year 2030 volumes that did not include the project volumes. The difference of the derived volumes for the Year 2030 and the Year 2004 (Calibrated Year) as obtained from the Travel Demand Model was added to the existing volumes to obtain the Year 2030 No Project volumes. The 2030 Plus Project volumes were obtained by adding project traffic to the 2030 No Project volumes.

To assess the impacts of the Mountain Gate at Shasta project on the study intersections and roadways, the study analyzed the following 2030 scenarios:

- Year 2030 No Project conditions
- Year 2030 Plus Project conditions

Year 2030 No Project Traffic Operations

Table 4.3-25 provides a summary of the resulting Year 2030 No Project intersection level of service.

TABLE 4.3-25
PEAK HOUR INTERSECTION LOS RESULTS – YEAR 2030 NO PROJECT CONDITIONS

#	Intersection	Control Type	Target LOS	AM Peak Hour			PM Peak Hour		
				Delay	LOS	Warrant Met?	Delay	LOS	Warrant Met?
1	Wonderland Blvd/Mt. Gate Rd	AWSC	C	10.7	B	--	9.5	A	--
2	Mt. Gate Rd/I-5 SB Ramps	TWSC	C	17.3	C	--	13.8	B	--
3	Mt. Gate Rd/I-5 NB Ramps	TWSC	C	15.5	C	--	12.7	B	--
4	Old Oregon Trail/Holiday Rd	TWSC	C	14.2	B	--	13.1	B	--
5	SR 151/Ashby Rd	TWSC	C	17.1	C	no	16.7	C	no
6	SR 151 (WB)/Montana Ave	TWSC	C	15.3	C	no	16.3	C	no
7	SR 151 (EB)/Montana Ave	TWSC	C	18.7	C	no	15.4	C	no
8	SR 151/Median Ave	TWSC	C	29.5	D	no	32.8	D	no
9	Mussel Shoals Ave/Red Bluff St	AWSC	C	7.1	A	no	7.2	A	no

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#	Intersection	Control Type	Target LOS	AM Peak Hour			PM Peak Hour		
				Delay	LOS	Warrant Met?	Delay	LOS	Warrant Met?
10	Mussel Shoals Ave/Main St	AWSC	C	7.2	A	no	7.5	A	no
11	SR 151/Mussels Shoals Ave	TWSC	C	35.3	E	no	149.8	F	no
12	Shasta Way/Front St	TWSC	C	12.2	B	no	10.4	B	no
13	SR 151/Shasta St	TWSC	C	Ovr	F	yes	Ovr	F	yes
14	SR 151/Cascade Blvd	Signal	C	24.6	C	--	22.6	C	--
15	SR 151/I-5 SB Off-Ramp	Signal	C	9.4	A	--	9.2	A	--
16	Lake Blvd/Pine Grove Ave	TWSC	C	21.2	C	no	36.4	E	no
17	Pine Grove Ave/Ashby Rd	TWSC	C	20.3	C	no	31.9	D	no
18	Pine Grove Ave/Cascade Blvd	TWSC	C	Ovr	F	yes	Ovr	F	yes
19	Pine Grove Ave/I-5 SB Ramps	TWSC	C	35.4	E	yes	567.3	F	yes
20	Pine Grove Ave/I-5 NB Ramps	TWSC	C	325.2	F	yes	860.7	F	yes
21	Pine Grove Ave/Twin View Blvd	TWSC	C	23.6	C	no	25.7	D	--
22	Oasis Rd/Cascade Boulevard	TWSC	C	37.1	D	--	86.9	F	--
23	Oasis Rd/I-5 SB Ramps	TWSC	C	14.4	B	--	10.6	B	--
24	Oasis Rd/I-5 NB Ramps	TWSC	C	25.7	C	--	44.9	D	--
25	Oasis Rd/Twin View Blvd	TWSC	C	30.7	C	--	43.0	D	--
26	SR 273/Caterpillar Rd	Signal	D	35.6	D	--	27.1	C	--
27	SR 273/Northpoint Dr	Signal	D	16.9	B	--	23.6	C	--
28	SR 273/Lake Blvd (SR 299)	Signal	D	36.7	D	--	58.7	E	--
29	SR 299/I-5 SB Ramps	Signal	D	15.2	B	--	22.5	C	--
30	SR 299/I-5 NB Ramps	Signal	D	22.2	C	--	25.6	C	--
31	Cypress Ave/Bechelli Lane	Signal	C	21.0	C	--	32.9	C	--
32	Cypress Ave/I-5 SB Ramps	Signal	D	29.1	C	--	84.7	F	--
33	Cypress Ave/I-5 NB Ramps	Signal	D	37.1	D	--	58.6	E	--
34	Cypress Ave/Hilltop Dr	Signal	C	25.3	C	--	42.6	D	--

Source: Omni-Means 2008

Notes: Bolded entries indicate intersections operating at unacceptable LOS. TWSC = two-way stop control; AWSC = all-way stop control; Warrant = Caltrans' peak-hour volume-based signal warrant. Delay in seconds. Mountain Gate Road also known as Old Oregon Trail.

As shown in **Table 4.3-25**, the following intersections are projected to operate at unacceptable LOS at least during one peak-hour period:

- SR 151/Median Avenue
- SR 151/Mussel Shoals Avenue

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- SR 151/Shasta Street (would meet the warrant)
- Lake Boulevard/Pine Grove Avenue
- Pine Grove Avenue/Ashby Road
- Pine Grove Avenue/Cascade Boulevard (would meet the warrant)
- Pine Grove Avenue/I-5 SB Ramps (would meet the warrant)
- Pine Grove Avenue/I-5 NB Ramps (would meet the warrant)
- Pine Grove Avenue/Twin View Boulevard
- Oasis Road/Cascade Boulevard
- Oasis Road/I-5 NB Ramps
- Oasis Road/Twin View Boulevard
- SR 273/Lake Boulevard (SR 299)
- Cypress Avenue/I-5 SB Ramps
- Cypress Avenue/I-5 NB Ramps
- Cypress Avenue/Hilltop Drive

Roadway Segments

Year 2030 No Project daily traffic operations along roadway segments were analyzed by comparing derived Year 2030 No Project ADT volumes to the ADT-based level of service thresholds that correspond to the roadway type assumed for Year 2030 No Project conditions following implementation of planned improvements. **Table 4.3-26** contains a summary of the Year 2030 No Project roadway segment level of service conditions.

TABLE 4.3-26
ROADWAY LOS RESULTS – YEAR 2030 NO PROJECT CONDITIONS

Roadway	Capacity Configuration	Average Daily Traffic Volumes	LOS
Shasta Dam Boulevard – Between North Boulevard and Ashby Road	2-Lane Undivided Arterial	8,840	A
Ashby Road – Between Fort Peck Street and Flower Street	2-Lane Collector	5,760	A
Montana Avenue – Between Main Street and Front Street	2-Lane Collector	1,500	A
Red Bluff Street – Between Washington Avenue and Grand River Avenue	Residential	510	A
Main Street – Between Washington Avenue and Grand River Avenue	Residential	680	B

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Roadway	Capacity Configuration	Average Daily Traffic Volumes	LOS
Mussel Shoals Avenue – Between Front Street and Shasta Dam Boulevard (SR 151)	Residential Collector with Frontages	1,910	B
Grand Coulee Boulevard – Between Fort Peck Street and Shasta Dam Boulevard (SR 151)	2-Lane Collector	2,700	A
Pine Grove Avenue – Between Lake Boulevard and Ashby Road	2-Lane Undivided Arterial	6,660	A
Cascade Boulevard – Between Pine Grove Avenue and Deer Creek Avenue	2-Lane Undivided Arterial	5,200	A
Pine Grove Avenue – West of Cascade Boulevard	2-Lane Undivided Arterial	14,720	E
SR 273 – Between Twin View Boulevard and Lake Boulevard	4-Lane Divided Arterial	20,330	A

Source: Omni-Means 2008

Notes: **Bolded** entries indicate intersections operating at unacceptable LOS.

As indicated in **Table 4.3-26**, all of the study roadway segments, with the exception of Pine Grove Avenue to the west of Cascade Boulevard, would operate at acceptable level of service on a daily basis under Year 2030 No Project conditions.

Freeway Mainline Segments

Year 2030 No Project mainline operations were evaluated utilizing the peak-hour volumes shown in **Table 4.3-27**.

TABLE 4.3-27
FREEWAY MAINLINE LOS RESULTS – YEAR 2030 NO PROJECT CONDITIONS

Freeway Mainline Segment	Number of Lanes	Target LOS	AM Peak Hour			PM Peak Hour		
			Volume	Density (pc/mi/ln)	LOS	Volume	Density (pc/mi/ln)	LOS
I-5 NB, south of Cypress Avenue Interchange	2	D	4,409	Ovr	F	4,950	Ovr	F
I-5 SB, south of Cypress Avenue Interchange	2	D	4,344	Ovr	F	4,192	Ovr	F
I-5 NB, north of Cypress Avenue Interchange	3	D	4,385	28.9	D	5,158	38.8	E
I-5 SB, north of Cypress Avenue Interchange	3	D	4,745	32.9	D	4,380	29.0	D
I-5 NB, north of SR 44 Interchange	2	D	4,261	Ovr	F	5,319	Ovr	F
I-5 SB, north of SR 44 Interchange	2	D	5,049	Ovr	F	4,409	Ovr	F
I-5 NB, north of SR 299 Interchange	2	D	3,828	37.5	E	4,500	Ovr	F
I-5 SB, north of SR 299 Interchange	2	D	4,130	Ovr	F	3,905	39.2	E

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Freeway Mainline Segment	Number of Lanes	Target LOS	AM Peak Hour			PM Peak Hour		
			Volume	Density (pc/mi/ln)	LOS	Volume	Density (pc/mi/ln)	LOS
I-5 NB, north of Twin View Boulevard Interchange	2	D	3,382	30.0	D	3,829	37.5	E
I-5 SB, north of Twin View Boulevard Interchange	2	D	3,612	33.5	D	3,505	31.8	D
I-5 NB, north of SR 273 Interchange	3	D	4,143	23.5	C	4,595	26.6	D
I-5 SB, north of SR 273 Interchange	3	D	4,345	24.8	C	4,248	24.2	C
I-5 NB, north of Oasis Road Interchange	3	D	2,900	17.6	B	3,367	20.5	C
I-5 SB, north of Oasis Road Interchange	3	D	3,008	18.3	C	2,838	17.2	B
I-5 NB, north of Pine Grove Avenue Interchange	3	C	2,559	16.3	B	2,668	16.7	B
I-5 SB, north of Pine Grove Avenue	2	C	2,485	15.6	B	2,564	16.2	B
I-5 NB, north of SR 151 Interchange	2	C	1,876	18.1	C	1,933	18.4	C
I-5 SB, north of SR 151 Interchange	2	C	1,773	17.2	B	1,823	17.4	B
I-5 NB, north of Mountain Gate Boulevard Interchange	2	C	1,710	15.3	B	1,775	15.9	B
I-5 SB, north of Mountain Gate Boulevard Interchange	2	C	1,638	14.7	B	1,692	15.1	B

Source: Omni-Means 2008

Notes: **Bolded** entries indicate segments operating at unacceptable LOS.

As shown in **Table 4.3-27**, the following mainline segments are projected to operate at unacceptable LOS conditions at least during one peak-hour period:

- I-5 NB, south of Cypress Avenue interchange
- I-5 SB, south of Cypress Avenue interchange
- I-5 NB, north of Cypress Avenue interchange
- I-5 NB, north of SR 44 interchange
- I-5 SB, north of SR 44 interchange
- I-5 NB, north of SR 299 interchange
- I-5 SB, north of SR 299 interchange
- I-5 NB, north of Twin View Boulevard interchange

Ramp Junctions

Year 2030 No Project ramp merge/diverge operations were evaluated utilizing the peak-hour volumes shown in **Table 4.3-28**.

TABLE 4.3-28
RAMP MERGE DIVERGE LOS – YEAR 2030 NO PROJECT CONDITIONS

I-5 & Cypress Avenue	Junction Type	Target LOS	AM Peak Hour			PM Peak Hour		
			Volume	Density (pc/mi/ln)	LOS	Volume	Density (pc/mi/ln)	LOS
I-5 NB On-Ramp	Merge	D	763	36.1	F	991	42.9	F
I-5 SB Off-Ramp	Diverge	D	1,290	30.7	D	1,159	30.1	D
I-5 & SR 44	Junction Type	Target LOS	AM Peak Hour			PM Peak Hour		
			Volume	Density (pc/mi/ln)	LOS	Volume	Density (pc/mi/ln)	LOS
I-5 NB Loop On-Ramp	Merge	D	599	34.6	D	836	42.4	F
I-5 NB Direct On-Ramp	Merge	D	576	26.8	C	1,018	33.0	D
I-5 SB Direct Off-Ramp	Diverge	D	954	54.8	F	793	48.4	F
I-5 SB Loop Off-Ramp	Diverge	D	820	45.2	F	697	40.4	E
I-5 & SR 273	Junction Type	Target LOS	AM Peak Hour			PM Peak Hour		
			Volume	Density (pc/mi/ln)	LOS	Volume	Density (pc/mi/ln)	LOS
I-5 NB On-Ramp	Merge	D	556	33.2	F	687	37.1	F
I-5 SB Off-Ramp	Diverge	D	734	30.5	D	678	29.9	D
I-5 & Oasis Road	Junction Type	Target LOS	AM Peak Hour			PM Peak Hour		
			Volume	Density (pc/mi/ln)	LOS	Volume	Density (pc/mi/ln)	LOS
I-5 NB On-Ramp	Merge	D	293	17.3	B	458	20.3	C
I-5 SB Off-Ramp	Diverge	D	384	21.8	C	405	20.9	C
I-5 & SR 151	Junction Type	Target LOS	AM Peak Hour			PM Peak Hour		
			Volume	Density (pc/mi/ln)	LOS	Volume	Density (pc/mi/ln)	LOS
I-5 NB Off-Ramp	Diverge	C	773	20.8	C	955	21.9	C
I-5 NB On-Ramp	Merge	C	152	12.2	B	113	11.5	B

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I-5 SB Off-Ramp	Diverge	C	40	19.5	B	89	20.5	C
I-5 SB On-Ramp	Diverge	C	991	17.4	B	787	17.4	B
I-5 & Mountain Gate Boulevard	Junction Type	Target LOS	AM Peak Hour			PM Peak Hour		
			Volume	Density (pc/mi/ln)	LOS	Volume	Density (pc/mi/ln)	LOS
I-5 NB Off-Ramp	Diverge	C	240	24.3	C	215	24.6	C
I-5 NB On-Ramp	Merge	C	41	21.7	C	56	22.3	C
I-5 SB Off-Ramp	Diverge	C	20	21.5	C	48	22.0	C
I-5 SB On-Ramp	Merge	C	263	19.3	B	183	18.9	B

Source: Omni-Means 2008

Notes: **Bolded** entries indicate segments operating at unacceptable LOS.

As indicated in **Table 4.3-28**, the following ramp merge/diverge junctions are projected to operate at unacceptable LOS conditions at least during one peak-hour period:

- I-5 and Cypress Avenue – NB On-Ramp
- I-5 and SR 44 – NB Loop On-Ramp, SB Direct Off-Ramp, SB Loop Off-Ramp
- I-5 and SR 273 – NB On-Ramp

CUMULATIVE IMPACTS AND MITIGATION MEASURES

Conflict with Applicable Intersection Level of Service – Cumulative Year 2020 Plus Project Conditions (Standards of Significance 1 and 2)

Impact 4.3.8 Under Year 2020 Plus Project conditions, all study area intersections would meet level of service standards with the imposition of mitigation. However, six study intersections are wholly outside the City of Shasta Lake's jurisdiction, and the City cannot be certain that mitigation will be made. Therefore, this impact would be **cumulatively considerable**.

Year 2020 Plus Project intersection conditions were simulated by superimposing traffic generated by the proposed project onto Year 2020 No Project traffic volumes at the study intersections and are summarized in **Table 4.3-29**.

TABLE 4.3-29
PEAK-HOUR INTERSECTION LOS RESULTS – CUMULATIVE YEAR 2020 PLUS PROJECT CONDITIONS

#	Intersection	Control Type	Target LOS	AM Peak Hour			PM Peak Hour		
				Delay	LOS	Warrant Met?	Delay	LOS	Warrant Met?
1	Wonderland Boulevard/Mt. Gate Rd	AWSC	C	37.2	E	--	49.0	E	yes
2	Mt. Gate Rd/I-5 SB Ramps	TWSC	C	20.5	C	--	25.1	D	no
3	Mt. Gate Rd/I-5 NB Ramps	TWSC	C	181.3	F	yes	125.2	F	yes
4	Mt. Gate Rd/Holiday Rd	TWSC	C	13.8	B	--	13.1	B	--
5	SR 151/Ashby Rd	TWSC	C	16.3	C	no	14.7	B	no
6	SR 151 (WB)/Montana Ave	TWSC	C	15.9	C	no	16.5	C	no
7	SR 151 (EB)/Montana Ave	TWSC	C	20.2	C	no	15.8	C	no
8	SR 151/Median Ave	TWSC	C	44.3	E	no	54.2	F	no
9	Mussel Shoals Ave/Red Bluff St	AWSC	C	7.2	A	no	7.4	A	no
10	Mussel Shoals Ave/Main St	AWSC	C	7.4	A	no	7.6	A	no
11	SR 151/Mussels Shoals Ave	TWSC	C	105.5	F	no	297.3	F	no
12	Shasta Way/Front St	TWSC	C	10.6	B	no	10.5	B	no
13	SR 151/Shasta St	TWSC	C	Ovr	F	yes	Ovr	F	yes
14	SR 151/Cascade Boulevard	Signal	C	58.8	E	--	70.7	E	--
15	SR 151/I-5 SB Off-Ramp	Signal	C	13.0	B	--	9.9	A	--
16	Lake Boulevard/Pine Grove Ave	TWSC	C	19.6	C	no	28.4	D	no
17	Pine Grove Ave/Ashby Rd	TWSC	C	18.7	C	no	22.3	C	no
18	Pine Grove Ave/Cascade Boulevard	TWSC	C	343.8	F	no	Ovr	F	no
19	Pine Grove Ave/I-5 SB Ramps	TWSC	C	19.9	C	no	77.6	F	yes
20	Pine Grove Ave/I-5 NB Ramps	TWSC	C	47.6	E	no	392.2	F	yes
21	Pine Grove Ave/Twin View Boulevard	TWSC	C	15.3	C	no	17.2	C	no
22	Oasis Rd/Cascade Boulevard	TWSC	C	41.6	D	--	44.0	D	--
23	Oasis Rd/I-5 SB Ramps	TWSC	C	8.4	A	--	10.9	B	--
24	Oasis Rd/I-5 NB Ramps	TWSC	C	19.8	B	--	41.0	D	--
25	Oasis Rd/Twin View Boulevard	TWSC	C	27.3	C	--	30.0	C	--
26	SR 273/Caterpillar Rd	Signal	D	35.3	D	--	26.8	C	--
27	SR 273/Northpoint Dr	Signal	D	16.3	B	--	21.6	C	--
28	SR 273/Lake Boulevard (SR 299)	Signal	D	33.7	C	--	45.1	D	--
29	SR 299 I-5 SB Ramps	Signal	D	13.2	B	--	22.2	C	--
30	SR 299/I-5 NB Ramps	Signal	D	21.2	C	--	22.7	C	--

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#	Intersection	Control Type	Target LOS	AM Peak Hour			PM Peak Hour		
				Delay	LOS	Warrant Met?	Delay	LOS	Warrant Met?
31	Cypress Ave/Bechelli Lane	Signal	C	25.9	C	--	33.4	C	--
32	Cypress Ave/I-5 SB Ramps	Signal	D	24.5	C	--	60.2	E	--
33	Cypress Ave/I-5 NB Ramps	Signal	D	29.8	C	--	53.1	D	--
34	Cypress Ave/Hilltop Dr	Signal	C	20.1	C	--	35.7	D	--

Source: Omni-Means 2008

Notes: Bolded entries indicate intersections operating at unacceptable LOS. TWSC = two-way stop control; AWSC = all-way stop control; Warrant = Caltrans' peak-hour volume-based signal warrant. Delay in seconds. Mountain Gate Road also known as Old Oregon Trail.

Based on a comparison of level of service between Year 2020 No Project and Year 2020 Plus Project conditions as presented in **Tables 4.3-21** and **4.3-29**, respectively, the following intersections that were found to be operating at unacceptable LOS under No Project conditions would continue to operate unacceptably with the addition of project traffic:

- SR 151/Median Avenue
- SR 151/Mussel Shoals Avenue
- SR 151/Shasta Street (would continue to meet the warrant)
- Pine Grove Avenue/Cascade Boulevard
- Pine Grove Avenue/I-5 SB Ramps (meets the warrant with the addition of project traffic)
- Pine Grove Avenue/I-5 NB Ramps (would continue to meet the warrant)
- Oasis Road/Cascade Boulevard
- Cypress Avenue/I-5 SB Ramps

Project traffic would deteriorate the level of service from an acceptable level of service under Year 2020 No Project conditions to an unacceptable level of service under Year 2020 Plus Project conditions at the following intersections:

- Wonderland Boulevard/Mountain Gate Road (meets the warrant with the addition of project traffic)
- Mountain Gate Road/I-5 NB Ramps (meets the warrant with the addition of project traffic)
- SR 151/Cascade Boulevard
- Lake Boulevard/Pine Grove Avenue
- Oasis Road/I-5 NB Ramps
- Cypress Avenue/Hilltop Drive

Mitigation Measures

Implementation of mitigation measures **MM 4.3.1**, **MM 4.3.3**, and **MM 4.3.5** would improve the level of service at all intersections to acceptable levels under Year 2020 Plus Project conditions. However, some of these intersections are partially or wholly outside the City of Shasta Lake's jurisdiction (see **Table 4.3-2** for a listing of intersection by jurisdiction) While the City will require the proposed project to either make the identified improvement or pay the appropriate proportionate share of the cost of improvements, and will hold the fees until requested by the jurisdiction, the City cannot be certain that the other agencies will permit the improvement and therefore must assume that the impacts could remain. As such, impacts to all of the intersections that are outside the City's jurisdiction are classified as **cumulatively considerable** and **significant and unavoidable** because the City cannot be certain that improvements will be made consistent with this Draft EIR.

Conflict with Applicable Roadway Level of Service – Cumulative Year 2020 Plus Project Conditions (Standards of Significance 1 and 2)

Impact 4.3.9 Following implementation of the proposed project, all study area roadway segments would meet level of service standards under Year 2020 Plus Project conditions. Therefore, this impact would be **less than cumulatively considerable**.

Year 2020 Plus Project daily traffic operations along roadway segments were analyzed by comparing derived Year 2020 Plus Project ADT volumes to the ADT-based LOS thresholds that correspond to the roadway type assumed for Year 2020 Plus Project conditions following implementation of planned improvements as described earlier. **Table 4.3-30** contains a summary of the cumulative Year 2020 Plus Project roadway segment LOS conditions.

TABLE 4.3-30
PEAK-HOUR ROADWAY LOS RESULTS – CUMULATIVE YEAR 2020 PLUS PROJECT CONDITIONS

Roadway	Capacity Configuration	Average Daily Traffic Volumes	LOS
Shasta Dam Boulevard – Between North Boulevard and Ashby Road	2-Lane Undivided Arterial	8,970	A
Ashby Road – Between Fort Peck Street and Flower Street	2-Lane Collector	5,090	A
Montana Avenue – Between Main Street and Front Street	2-Lane Collector	1,540	A
Red Bluff Street – Between Washington Avenue and Grand River Avenue	Residential	830	B
Main Street – Between Washington Avenue and Grand River Avenue	Residential	790	B
Mussel Shoals Avenue – Between Front Street and Shasta Dam Boulevard (SR 151)	Residential Collector with Frontages	2,450	B
Grand Coulee Boulevard – Between Fort Peck Street and Shasta Dam Boulevard (SR 151)	2-Lane Collector	2,890	A
Pine Grove Avenue – Between Lake Boulevard and Ashby Road	2-Lane Undivided Arterial	6,100	A

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Roadway	Capacity Configuration	Average Daily Traffic Volumes	LOS
Cascade Boulevard – Between Pine Grove Avenue and Deer Creek Avenue	2-Lane Undivided Arterial	4,860	A
Pine Grove Avenue – West of Cascade Boulevard	2-Lane Undivided Arterial	6,430	A
SR 273 – Between Twin View Boulevard and Lake Boulevard	4-Lane Divided Arterial	17,180	A

Source: Omni-Means 2008

As shown, all of the study area roadway segments are projected to operate at an acceptable LOS B or better after implementation of the proposed project under Year 2020 Plus Project cumulative conditions. This impact is therefore **less than cumulatively considerable**.

Mitigation Measures

None required.

Conflict with Applicable Freeway Mainline Segment Level of Service – Cumulative Year 2020 Plus Project Conditions (Standards of Significance 1 and 2)

Impact 4.3.10 Implementation of the proposed project would result in an increase in traffic volumes on vicinity freeways that would operate below level of service thresholds under Year 2020 Plus Project conditions. While the imposition of mitigation would reduce this impact, vicinity freeways are wholly outside the City of Shasta Lake's jurisdiction, and the City cannot be certain that mitigation will be made. Therefore, this impact would be **cumulatively considerable**.

Cumulative Year 2020 Plus Project mainline operations were evaluated utilizing the peak-hour volumes shown in **Table 4.3-31**.

TABLE 4.3-31
FREEWAY MAINLINE LOS RESULTS – CUMULATIVE YEAR 2020 PLUS PROJECT CONDITIONS

Freeway Mainline Segment	Number of Lanes	Target LOS	AM Peak Hour			PM Peak Hour		
			Volume	Density (pc/mi/ln)	LOS	Volume	Density (pc/mi/ln)	LOS
I-5 NB, south of Cypress Avenue Interchange	2	D	3,887	38.8	E	4,624	Ovr	F
I-5 SB, south of Cypress Avenue Interchange	2	D	4,054	42.9	E	3,701	35.0	E
I-5 NB, north of Cypress Avenue Interchange	3	D	3,983	25.5	C	4,923	35.2	E
I-5 SB, north of Cypress Avenue Interchange	3	D	4,559	30.8	D	4,058	26.1	D
I-5 NB, north of SR 44 Interchange	2	D	3,805	37.0	E	4,998	Ovr	F

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Freeway Mainline Segment	Number of Lanes	Target LOS	AM Peak Hour			PM Peak Hour		
			Volume	Density (pc/mi/ln)	LOS	Volume	Density (pc/mi/ln)	LOS
I-5 SB, north of SR 44 Interchange	2	D	4,584	Ovr	F	3,831	37.6	E
I-5 NB, north of SR 299 Interchange	2	D	3,351	29.6	D	4,187	Ovr	F
I-5 SB, north of SR 299 Interchange	2	D	3,802	37.0	E	3,361	29.7	D
I-5 NB, north of Twin View Boulevard Interchange	2	D	2,994	25.4	C	3,693	34.9	D
I-5 SB, north of Twin View Boulevard Interchange	2	D	3,379	30.0	D	3,069	26.2	D
I-5 NB, north of SR 273 Interchange	3	D	3,657	20.6	C	4,464	25.7	C
I-5 SB, north of SR 273 Interchange	3	D	4,145	23.5	C	3,717	20.9	C
I-5 NB, north of Oasis Road Interchange	3	D	2,786	16.9	B	3,455	21.0	C
I-5 SB, north of Oasis Road Interchange	3	D	3,077	18.7	C	2,754	16.7	B
I-5 NB, north of Pine Grove Avenue Interchange	3	C	2,627	16.7	B	2,981	18.6	C
I-5 SB, north of Pine Grove Avenue	3	C	2,738	17.2	B	2,676	16.8	B
I-5 NB, north of SR 151 Interchange	2	C	1,978	19.0	C	2,045	19.4	C
I-5 SB, north of SR 151 Interchange	2	C	1,823	17.6	B	1,962	18.7	C
I-5 NB, north of Mountain Gate Boulevard Interchange	2	C	1,546	13.8	B	1,594	14.3	B
I-5 SB, north of Mountain Gate Boulevard Interchange	2	C	1,443	12.9	B	1,484	13.3	B

Source: Omni-Means 2008

Notes: **Bolded** entries indicate segments operating at unacceptable LOS.

Based on a comparison of LOS between Year 2020 No Project and Year 2020 Plus Project conditions as presented in **Tables 4.3-23** and **4.3-31**, respectively, the following I-5 mainline segments that were found to be operating at an unacceptable level of service under No Project conditions would continue to operate unacceptably with the addition of project traffic:

- I-5 NB, south of Cypress Avenue interchange
- I-5 SB, south of Cypress Avenue interchange
- I-5 NB, north of SR 44 interchange

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- I-5 SB, north of SR 44 interchange
- I-5 NB, north of SR 299 interchange

The project traffic would deteriorate the level of service from an acceptable level of service under the Year 2020 No Project conditions to an unacceptable level of service under Year 2020 Plus Project conditions at the following freeway mainline segments:

- I-5 NB, north of Cypress Avenue interchange
- I-5 SB, north of SR 299 interchange

Mitigation Measures

Implementation of mitigation measure **MM 4.3.3**, described above, would improve the level of service at all freeway mainline segments to acceptable levels under Cumulative Year 2020 Plus Project conditions. However, Interstate 5 is wholly outside the jurisdiction of the City of Shasta Lake, which does not have the ability to construct improvements on I-5 or on any facility within Caltrans' jurisdiction. The DEIR must assume that the improvements are not constructed and the impacts remain significant and unavoidable. This has the unfortunate result of appearing that the impacts of the project are being ignored by the City of Shasta Lake, which is not the case. The City is requiring that the project contribute toward freeway mainline improvements. Yet because I-5 is wholly outside the City of Shasta Lake's jurisdiction, the City cannot be certain that improvements will be made consistent with this DEIR. If the improvement cannot be constructed, the impact is not fully mitigated, and the agency can only conclude that the impact is **cumulatively considerable** and **significant and unavoidable**.

Conflict with Applicable Ramp Junction Level of Service – Cumulative Year 2020 Plus Project Conditions (Standards of Significance 1 and 2)

Impact 4.3.11 Implementation of the proposed project would result in an increase in traffic volumes on vicinity freeway ramp junctions under Year 2020 Plus Project conditions that would exacerbate an unacceptable level of service. While the imposition of mitigation would reduce this impact, vicinity freeway ramp junctions are wholly outside the City of Shasta Lake's jurisdiction, and the City cannot be certain that mitigation will be made. Therefore, this impact would be **cumulatively considerable**.

Year 2020 Plus Project ramp merge/diverge operations were evaluated utilizing the peak-hour volumes shown in **Table 4.3-32**.

TABLE 4.3-32
CUMULATIVE YEAR 2020 PLUS PROJECT RAMP MERGE DIVERGE LOS

I-5 & Cypress Avenue	Junction Type	Target LOS	AM Peak Hour			PM Peak Hour		
			Volume	Density (pc/mi/ln)	LOS	Volume	Density (pc/mi/ln)	LOS
I-5 NB On-Ramp	Merge	D	715	39.3	F	1,030	41.0	F
I-5 SB Off-Ramp	Diverge	D	1,309	30.1	D	1,144	28.7	D
I-5 & SR 44	Junction	Target	AM Peak Hour			PM Peak Hour		

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	Type	LOS	Volume	Density (pc/mi/ln)	LOS	Volume	Density (pc/mi/ln)	LOS
I-5 NB Loop On-Ramp	Merge	D	567	31.6	D	772	40.6	F
I-5 NB Direct On-Ramp	Merge	D	479	24.3	C	905	31.3	D
I-5 SB Direct Off-Ramp	Diverge	D	818	50.5	F	763	42.9	F
I-5 SB Loop Off-Ramp	Diverge	D	698	43.5	F	583	38.0	E
I-5 & SR 273	Junction Type	Target LOS	AM Peak Hour			PM Peak Hour		
			Volume	Density (pc/mi/ln)	LOS	Volume	Density (pc/mi/ln)	LOS
I-5 NB On-Ramp	Merge	D	457	29.1	D	691	36.3	F
I-5 SB Off-Ramp	Diverge	D	770	30.1	D	585	27.5	C
I-5 & Oasis Road	Junction Type	Target LOS	AM Peak Hour			PM Peak Hour		
			Volume	Density (pc/mi/ln)	LOS	Volume	Density (pc/mi/ln)	LOS
I-5 NB On-Ramp	Merge	D	380	17.2	B	524	21.3	C
I-5 SB Off-Ramp	Diverge	D	450	22.8	C	483	21.0	C
I-5 & SR 151	Junction Type	Target LOS	AM Peak Hour			PM Peak Hour		
			Volume	Density (pc/mi/ln)	LOS	Volume	Density (pc/mi/ln)	LOS
I-5 NB Off-Ramp	Diverge	C	827	22.8	C	1,226	27.3	C
I-5 NB On-Ramp	Merge	C	255	12.7	B	192	12.9	B
I-5 SB Off-Ramp	Diverge	C	103	20.0	C	204	21.5	C
I-5 SB On-Ramp	Diverge	C	1,250	27.4	C	862	24.6	C
I-5 & Mountain Gate Boulevard	Junction Type	Target LOS	AM Peak Hour			PM Peak Hour		
			Volume	Density (pc/mi/ln)	LOS	Volume	Density (pc/mi/ln)	LOS
I-5 NB Off-Ramp	Diverge	C	552	25.5	C	552	25.9	C
I-5 NB On-Ramp	Merge	C	74	20.1	C	89	20.6	C
I-5 SB Off-Ramp	Diverge	C	56	19.4	B	81	19.9	B
I-5 SB On-Ramp	Merge	C	538	19.3	B	605	20.0	C

Source: Omni-Means 2008

Notes: **Bolded** entries indicate segments operating at unacceptable LOS.

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Based on a comparison of Year 2020 No Project versus Year 2020 Plus Project ramp merge/diverge level of service as presented in **Table 4.3-24** and **Table 4.3-32**, respectively, the following ramp merge/diverge junctions, which were found to operate unacceptably for Year 2020 No Project conditions, would continue to operate at an unacceptable level of service with the addition of project traffic:

- I-5 and Cypress Avenue – NB On-Ramp
- I-5 and SR 44 – NB Loop On-Ramp, SB Direct Off-Ramp, SB Loop Off-Ramp
- I-5 and SR 273 – NB On-Ramp

The additional I-5 northbound mainline segment and collector distributor ramp configuration described in **Table 4.3-18** would provide an acceptable level of service for this ramp junction under Cumulative Year 2020 Plus Project conditions. While mitigation measures **MM 4.3.1c** and **MM 4.3.3** require the project applicant to contribute its fair-share amount for all needed improvements identified in **Table 4.3-18**, Interstate 5 is wholly outside the jurisdiction of the City of Shasta Lake, which does not have the ability to construct improvements on I-5 or on any facility within Caltrans' jurisdiction. The DEIR must assume that the improvements are not constructed and the impacts remain significant and unavoidable. The City is requiring that the project contribute toward I-5 improvements. Yet because I-5 is wholly outside the City of Shasta Lake's jurisdiction, the City cannot be certain that improvements will be made consistent with this DEIR. If the improvement cannot be constructed, the impact is not fully mitigated, and the agency can only conclude that the impact is **cumulatively considerable** and **significant and unavoidable**.

Mitigation Measures

Payment of fair share contributions as described in **Mitigation Measure 4.3.3**.

Conflict with Applicable Level of Service Due to Wonderland Boulevard Extension – Cumulative 2020 Plus Project Conditions (Standards of Significance 1 and 2)

Impact 4.3.12 Implementation of the Wonderland Boulevard southern access extension conceptualized under the proposed project would result in an exceedance of level of service thresholds under Year 2020 Plus Project conditions. This impact would be **cumulatively considerable**.

As described above, access to the Area Plan is proposed from Wonderland Boulevard and the Mountain Gate interchange with Interstate 5 from the north, and an extension of Wonderland Boulevard to Cascade Boulevard from the south. Wonderland Boulevard would connect to Cascade Boulevard at a "T" intersection with Cascade Boulevard. This southerly extension of Wonderland Boulevard would involve the construction of improvements outside of the main development area of the proposed project.

According to the Traffic Impact Analysis Report (Omni-Means 2008), a southerly connection of Wonderland Boulevard as a "T" intersection with Cascade Boulevard would result in an unacceptable level of service at several other vicinity intersections.

Mitigation Measures

Implementation of mitigation measures **MM 4.3.1a** through **MM 4.3.1d** and **MM 4.3.3**, described previously, would ensure that intersection improvements were installed at various stages of project development. Construction of the intersections would result in impacts that are less than significant however some of the improvements are not within the City's jurisdiction. As these improvements are not wholly within the ability of the City to implement this EIR assumes that the improvements might not occur and that this impact would remain **cumulatively considerable and unavoidable**.

Conflict with Applicable Intersection Level of Service – Cumulative Year 2030 Plus Project Conditions (Standards of Significance 1 and 2)

Impact 4.3.13 Under Year 2030 Plus Project conditions, all study area intersections would meet level of service standards with the imposition of mitigation. However, six study intersections are wholly outside the City of Shasta Lake's jurisdiction, and the City cannot be certain that mitigation will be made. Therefore, this impact would be **cumulatively considerable**.

Year 2030 Plus Project conditions were simulated by superimposing traffic generated by the proposed project onto Year 2030 No Project traffic volumes at study intersections. The resulting Year 2030 Plus Project intersection and roadway traffic volumes are shown in **Table 4.3-33**.

TABLE 4.3-33
PEAK HOUR INTERSECTION LOS RESULTS – CUMULATIVE YEAR 2030 PLUS PROJECT CONDITIONS

#	Intersection	Control Type	Target LOS	AM Peak Hour			PM Peak Hour		
				Delay	LOS	Warrant Met?	Delay	LOS	Warrant Met?
1	Wonderland Blvd/Mt. Gate Rd	TWSC	C	226.7	F	yes		F	yes
2	Wonderland Blvd/Old Oregon Trail	AWSC	C	38.7	E	–	54.2	F	yes
3	Mt. Gate Rd/I-5 SB Ramps	TWSC	C	17.1	C	no	21.6	C	no
4	Mt. Gate Rd/I-5 NB Ramps	TWSC	C	65.0	F	yes	59.5	F	yes
5	Old Oregon Trail/I-5 SB Ramps	TWSC	C	32.9	D	no	36.2	E	no
6	Old Oregon Trail/I-5 NB Ramps	TWSC	C	246.1	F	yes	176.4	F	yes
7	Old Oregon Trail/ Holiday Rd	TWSC	C	15.3	C	–	14.2	B	–
8	SR 151/Ashby Rd	TWSC	C	18.6	C	no	18.4	C	no
9	SR 151 (WB)/Montana Ave	TWSC	C	16.8	C	no	17.9	C	no
10	SR 151 (EB)/Montana Ave	TWSC	C	21.1	C	no	17.3	C	no
11	SR 151/Median Ave	TWSC	C	47.3	E	no	65.1	F	no
12	Mussel Shoals Ave/Red Bluff St	AWSC	C	7.3	A	no	7.4	A	no
13	Mussel Shoals Ave/Main St	AWSC	C	7.4	A	no	7.7	A	no
14	SR 151/Mussels Shoals Ave	TWSC	C	114.4	F	no	386.4	F	yes
15	Shasta Way/Front St	TWSC	C	12.5	B	no	10.7	B	no

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#	Intersection	Control Type	Target LOS	AM Peak Hour			PM Peak Hour		
				Delay	LOS	Warrant Met?	Delay	LOS	Warrant Met?
16	SR 151/Shasta St	TWSC	C	Ovr	F	yes	Ovr	F	yes
17	SR 151/Cascade Blvd	Signal	C	55.8	E	--	83.2	F	--
18	SR 151/I-5 SB Off-Ramp	Signal	C	16.1	B	--	9.6	A	--
19	Lake Blvd/Pine Grove Ave	TWSC	C	25.0	C	no	49.2	E	no
20	Pine Grove Ave/Ashby Rd	TWSC	C	22.8	C	no	38.0	E	no
21	Pine Grove Ave/Cascade Blvd	TWSC	C	Ovr	F	yes	Ovr	F	yes
22	Pine Grove Ave/I-5 SB Ramps	TWSC	C	127.7	F	yes	869.9	F	yes
23	Pine Grove Ave/I-5 NB Ramps	TWSC	C	565.3	F	yes	Ovr	F	yes
24	Pine Grove Ave/Twin View Blvd	TWSC	C	30.0	D	no	37.2	E	no
25	Oasis Rd/Cascade Blvd	TWSC	C	38.4	D	--	88.2	F	--
26	Oasis Rd/I-5 SB Ramps	TWSC	C	14.5	B	--	13.8	B	--
27	Oasis Rd/I-5 NB Ramps	TWSC	D	29.6	C	--	57.0	E	--
28	Oasis Rd/Twin View Blvd	TWSC	C	31.4	C	--	47.4	D	--
29	SR 273/Caterpillar Rd	Signal	D	38.2	D	--	27.9	C	--
30	SR 273/Northpoint Dr	Signal	D	17.0	B	--	26.4	C	--
31	SR 273/Lake Blvd (SR 299)	Signal	D	39.3	D	--	63.6	E	--
32	SR 299/I-5 SB Ramps	Signal	D	17.2	B	--	25.9	C	--
33	SR 299/I-5 NB Ramps	Signal	D	24.1	C	--	27.0	C	--
34	Cypress Ave/Bechelli Lane	Signal	C	21.1	C	--	34.9	C	--
35	Cypress Ave/I-5 SB Ramps	Signal	D	32.8	C	--	89.0	F	--
36	Cypress Ave/I-5 NB Ramps	Signal	D	42.1	D	--	62.9	E	--
37	Cypress Ave/Hilltop Dr	Signal	C	25.3	C	--	46.9	D	--

Source: Omni-Means 2008

Notes: Bolded entries indicate intersections operating at unacceptable LOS. TWSC = two-way stop control; AWSC = all-way stop control; Warrant = Caltrans' peak-hour volume-based signal warrant. Delay in seconds.

Based on a comparison of level of service between Year 2030 No Project and Year 2030 Plus Project conditions as presented in **Tables 4.3-25** and **4.3-33**, respectively, the following intersections that were found to be operating at unacceptable LOS under Year 2030 No Project conditions would continue to operate unacceptably with the addition of project traffic:

- SR 151/Median Avenue
- SR 151/Mussel Shoals Avenue (meets the warrant with the addition of project traffic)
- SR 151/Shasta Street (would continue to meet the warrant)
- Lake Boulevard/Pine Grove Avenue

- Pine Grove Avenue/Ashby Road
- Pine Grove Avenue/Cascade Boulevard (would continue to meet the warrant)
- Pine Grove Avenue/I-5 SB Ramps (would continue to meet the warrant)
- Pine Grove Avenue/I-5 NB Ramps (would continue to meet the warrant)
- Oasis Rd/Cascade Boulevard
- Oasis Road/I-5 NB Ramps
- Oasis Road/Twin View Boulevard
- SR 273/Lake Boulevard (SR 299)
- Cypress Avenue/I-5 SB Ramps
- Cypress Avenue/I-5 NB Ramps
- Cypress Avenue/Hilltop Drive

The project traffic would deteriorate the level of service from an acceptable level of service under the Year 2030 No Project conditions to an unacceptable level of service under Year 2030 Plus Project conditions at the following intersections:

- Wonderland Boulevard/Mountain Gate Road (meets the warrant with the addition of project traffic)
- Mountain Gate Road/I-5 NB Ramps (meets the warrant with the addition of project traffic)
- SR 151/Cascade Boulevard

Mitigation Measures

Mitigation measures **MM 4.3.1a** through **MM 4.3.1c** and **MM 4.3.3** would improve the level of service at the Mountain Gate Road/I-5 interchange; however, this facility is outside the City of Shasta Lake's jurisdiction. As such, impacts to all of the intersections that are outside the City's jurisdiction are classified as **cumulatively considerable** and **significant and unavoidable** because the City cannot be certain that improvements will be made consistent with this Draft EIR. (The intersections at Lake Boulevard/Pine Grove Avenue, Pine Grove Avenue/Cascade Boulevard, Pine Grove Avenue/Twin View Boulevard, Oasis Road/Cascade Boulevard, and Cypress Avenue/Hilltop Drive are within the City's jurisdiction; therefore, impacts to those intersections can be mitigated.)

Conflict with Applicable Roadway Level of Service – Cumulative Year 2030 Plus Project Conditions (Standards of Significance 1 and 2)

Impact 4.3.14 Following implementation of the proposed project, all study area roadway segments would meet level of service standards under Year 2030 Plus Project conditions. This impact would be **potentially cumulatively considerable**.

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Year 2030 Plus Project daily traffic operations along roadway segments were analyzed by comparing derived Year 2030 Plus Project ADT volumes to the ADT-based level of service thresholds that correspond to the roadway type assumed for Year 2030 Plus Project conditions following implementation of planned improvements as described earlier. **Table 4.3-34** contains a summary of the Year 2030 Plus Project roadway segment level of service conditions.

TABLE 4.3-34
PEAK-HOUR ROADWAY LOS RESULTS – CUMULATIVE YEAR 2020 PLUS PROJECT CONDITIONS

Roadway	Capacity Configuration	Average Daily Traffic Volumes	LOS
Shasta Dam Boulevard – Between North Boulevard and Ashby Road	2-Lane Undivided Arterial	9,330	B
Ashby Road – Between Fort Peck Street and Flower Street	2-Lane Collector	6,070	B
Montana Avenue – Between Main Street and Front Street	2-Lane Collector	1,590	A
Red Bluff Street – Between Washington Avenue and Grand River Avenue	Residential	870	B
Main Street – Between Washington Avenue and Grand River Avenue	Residential	900	B
Mussel Shoals Avenue – Between Front Street and Shasta Dam Boulevard (SR 151)	Residential Collector with Frontages	2,490	B
Grand Coulee Boulevard – Between Fort Peck Street and Shasta Dam Boulevard (SR 151)	2-Lane Collector	2,930	A
Pine Grove Avenue – Between Lake Boulevard and Ashby Road	2-Lane Undivided Arterial	7,170	A
Cascade Boulevard – Between Pine Grove Avenue and Deer Creek Avenue	2-Lane Undivided Arterial	5,550	A
Pine Grove Avenue – West of Cascade Boulevard	2-Lane Undivided Arterial	15,140	F
SR 273 – Between Twin View Boulevard and Lake Boulevard	4-Lane Divided Arterial	21,510	A

Source: Omni-Means 2008

Notes: **Bolded** entries indicate segments operating at unacceptable LOS.

As shown in **Table 4.3-34**, all of the study roadway segments, with the exception of Pine Grove Avenue to the west of Cascade Boulevard, would operate at an acceptable level of service on a daily basis under Year 2030 Plus Project conditions.

Mitigation Measures

MM 4.3.14 The following improvements shall be implemented for Year 2030 Plus Project conditions:

- Widening of the roadway segment from Pine Grove Avenue to the west of Cascade Boulevard to four-lane arterial standards.

Timing/Implementation: Implemented prior to and during construction

Enforcement/Monitoring: City of Shasta Lake Development Services Department

Implementation of mitigation measure **MM 4.3.14** would reduce impacts to **less than cumulatively considerable**.

Conflict with Applicable Freeway Mainline Segment Level of Service – Cumulative Year 2030 Plus Project Conditions (Standards of Significance 1 and 2)

Impact 4.3.15 Implementation of the proposed project would result in an increase in traffic volumes on vicinity freeways that would operate below level of service thresholds under Year 2030 Plus Project conditions. While the imposition of mitigation would reduce this impact, vicinity freeways are wholly outside the City of Shasta Lake's jurisdiction, and the City cannot be certain that mitigation will be made. Therefore, this impact would be **cumulatively considerable**.

Year 2030 Plus Project mainline operations were evaluated utilizing the peak-hour volumes shown in **Table 4.3-35**.

TABLE 4.3-35
FREEWAY MAINLINE LOS RESULTS – CUMULATIVE YEAR 2030 PLUS PROJECT CONDITIONS

Freeway Mainline Segment	Number of Lanes	Target LOS	AM Peak Hour			PM Peak Hour		
			Volume	Density (pc/mi/ln)	LOS	Volume	Density (pc/mi/ln)	LOS
I-5 NB, south of Cypress Avenue Interchange	2	D	4,457	Ovr	F	5,018	Ovr	F
I-5 SB, south of Cypress Avenue Interchange	2	D	4,408	Ovr	F	4,250	Ovr	F
I-5 NB, north of Cypress Avenue Interchange	3	D	4,473	29.9	D	5,296	41.3	D
I-5 SB, north of Cypress Avenue Interchange	3	D	4,879	34.6	D	4,485	30.0	F
I-5 NB, north of SR 44 Interchange	2	D	4,393	Ovr	F	5,523	Ovr	F
I-5 SB, north of SR 44 Interchange	2	D	5,245	Ovr	F	4,569	Ovr	F
I-5 NB, north of SR 299 Interchange	2	D	4,000	41.5	E	4,756	Ovr	E
I-5 SB, north of SR 299 Interchange	2	D	4,374	Ovr	F	4,113	43.2	E
I-5 NB, north of Twin View Boulevard Interchange	2	D	3,561	32.7	D	4,100	44.2	E
I-5 SB, north of Twin View Boulevard Interchange	2	D	3,872	38.5	E	3,722	35.4	E
I-5 NB, north of SR 273 Interchange	3	D	4,381	25.1	C	4,952	29.6	D

4.3 TRANSPORTATION AND CIRCULATION

Freeway Mainline Segment	Number of Lanes	Target LOS	AM Peak Hour			PM Peak Hour		
			Volume	Density (pc/mi/ln)	LOS	Volume	Density (pc/mi/ln)	LOS
I-5 SB, north of SR 273 Interchange	3	D	4,685	27.3	D	4,534	26.2	C
I-5 NB, north of Oasis Road Interchange	3	D	3,216	19.5	C	3,843	23.4	C
I-5 SB, north of Oasis Road Interchange	3	D	3,464	21.0	C	3,216	19.5	C
I-5 NB, north of Pine Grove Avenue Interchange	3	C	2,945	18.8	C	3,238	20.2	C
I-5 SB, north of Pine Grove Avenue	3	C	3,028	19.1	C	3,023	19.1	C
I-5 NB, north of SR 151 Interchange	2	C	2,199	21.2	C	2,259	21.5	C
I-5 SB, north of SR 151 Interchange	2	C	2,045	19.8	C	2,220	21.2	C
I-5 NB, north of Mountain Gate Boulevard Interchange	2	C	1,730	15.5	B	1,792	16.0	B
I-5 SB, north of Mountain Gate Boulevard Interchange	2	C	1,653	14.8	B	1,713	15.3	B

Source: Omni-Means 2008

Notes: **Bolded** entries indicate segments operating at unacceptable LOS.

Based on a comparison of level of service between Year 2030 No Project and Year 2030 Plus Project conditions as presented in **Tables 4.3-27** and **4.3-35**, respectively, the following I-5 mainline segments that were found to be operating at an unacceptable level of service under Year 2030 No Project conditions would continue to operate unacceptably with the addition of project traffic:

- I-5 NB, south of Cypress Avenue interchange
- I-5 SB, south of Cypress Avenue interchange
- I-5 NB, north of Cypress Avenue interchange
- I-5 NB, north of SR 44 interchange
- I-5 SB, north of SR 44 interchange
- I-5 NB, north of SR 299 interchange
- I-5 SB, north of SR 299 interchange
- I-5 NB, north of Twin View Boulevard interchange

The project traffic would deteriorate the level of service from an acceptable level of service under the Year 2030 No Project conditions to an unacceptable level of service under Year 2030 Plus Project conditions at the following freeway mainline segment:

- I-5 SB, north of Twin View Boulevard interchange

Mitigation Measures

Implementation of mitigation measures **MM 4.3.1a** through **MM 4.3.1c** and **MM 4.3.3**, described above, would improve the level of service at all freeway mainline segments to acceptable levels under Cumulative Year 2020 Plus Project conditions. However, Interstate 5 is wholly outside the jurisdiction of the City of Shasta Lake, which does not have the ability to construct improvements on I-5 or on any facility within Caltrans' jurisdiction. The Draft EIR must assume that the improvements are not constructed and the impacts remain significant and unavoidable. This has the unfortunate result of appearing that the impacts of the project are being ignored by the City of Shasta Lake, which is not the case. The City is requiring that the project contribute toward freeway mainline improvements. Yet because I-5 is wholly outside the City of Shasta Lake's jurisdiction, the City cannot be certain that improvements will be made consistent with this Draft EIR. If the improvement cannot be constructed, the impact is not fully mitigated, and the agency can only conclude that the impact is **cumulatively considerable** and **significant and unavoidable**.

Conflict with Applicable Ramp Junction Level of Service – Cumulative Year 2030 Plus Project Conditions (Standards of Significance 1 and 2)

Impact 4.3.16 Implementation of the proposed project would result in an increase in traffic volumes on vicinity freeway ramp junctions under Year 2030 Plus Project conditions that would exacerbate unacceptable level of service. While the imposition of mitigation would reduce this impact, vicinity freeway ramp junctions are wholly outside the City of Shasta Lake's jurisdiction, and the City cannot be certain that mitigation will be made. Therefore, this impact would be **cumulatively considerable**.

Year 2030 Plus Project ramp merge/diverge operations were evaluated utilizing the peak-hour volumes shown in **Table 4.3-36**.

4.3 TRANSPORTATION AND CIRCULATION

**TABLE 4.3-36
CUMULATIVE YEAR 2030 PLUS PROJECT RAMP MERGE DIVERGE LOS**

I-5 & Cypress Avenue	Junction Type	Target LOS	AM Peak Hour			PM Peak Hour		
			Volume	Density (pc/mi/ln)	LOS	Volume	Density (pc/mi/ln)	LOS
I-5 NB On-Ramp	Merge	D	802	37.1	F	1,062	44.4	F
I-5 SB Off-Ramp	Diverge	D	1,360	31.7	D	1,207	31.0	D
I-5 & SR 44	Junction Type	Target LOS	AM Peak Hour			PM Peak Hour		
			Volume	Density (pc/mi/ln)	LOS	Volume	Density (pc/mi/ln)	LOS
I-5 NB Loop On-Ramp	Merge	D	611	35.8	E	860	44.2	F
I-5 NB Direct On-Ramp	Merge	D	609	27.8	C	1,018	34.4	D
I-5 SB Direct Off-Ramp	Diverge	D	978	57.2	F	807	50.4	F
I-5 SB Loop Off-Ramp	Diverge	D	858	47.3	F	737	42.2	F
I-5 & SR 273	Junction Type	Target LOS	AM Peak Hour			PM Peak Hour		
			Volume	Density (pc/mi/ln)	LOS	Volume	Density (pc/mi/ln)	LOS
I-5 NB On-Ramp	Merge	D	614	35.6	F	773	40.7	F
I-5 SB Off-Ramp	Diverge	D	816	32.8	D	748	32.0	D
I-5 & Oasis Road	Junction Type	Target LOS	AM Peak Hour			PM Peak Hour		
			Volume	Density (pc/mi/ln)	LOS	Volume	Density (pc/mi/ln)	LOS
I-5 NB On-Ramp	Merge	D	371	19.6	B	577	23.6	C
I-5 SB Off-Ramp	Diverge	D	499	25.1	C	497	23.7	C
I-5 & SR 151	Junction Type	Target LOS	AM Peak Hour			PM Peak Hour		
			Volume	Density (pc/mi/ln)	LOS	Volume	Density (pc/mi/ln)	LOS
I-5 NB Off-Ramp	Diverge	C	912	23.4	C	1,267	26.0	C
I-5 NB On-Ramp	Merge	C	228	14.2	B	182	13.5	B
I-5 SB Off-Ramp	Diverge	C	95	22.4	C	182	24.2	C

I-5 SB On-Ramp	Diverge	C	1,317	30.1	D	942	27.9	C
I-5 & Mountain Gate Boulevard	Junction Type	Target LOS	AM Peak Hour			PM Peak Hour		
			Volume	Density (pc/mi/ln)	LOS	Volume	Density (pc/mi/ln)	LOS
I-5 NB Off-Ramp	Diverge	C	578	27.7	C	554	28.0	C
I-5 NB On-Ramp	Merge	C	76	21.9	C	92	22.4	C
I-5 SB Off-Ramp	Diverge	C	57	21.6	C	89	22.3	C
I-5 SB On-Ramp	Merge	C	545	21.4	C	608	25.9	C

Source: Omni-Means 2008

Notes: **Bolded** entries indicate segments operating at unacceptable LOS.

Based on a comparison of Year 2030 No Project versus Year 2030 Plus Project ramp merge/diverge level of service as presented in **Tables 4.3-28** and **4.3-36**, respectively, the following ramp merge/diverge junctions which were found to operate unacceptably for Year 2030 No Project conditions would continue to operate at an unacceptable level of service with the addition of project traffic:

- I-5 and Cypress Avenue – NB On-Ramp
- I-5 and SR 44 – NB Loop On-Ramp, SB Direct Off-Ramp, SB Loop Off-Ramp
- I-5 and SR 273 – NB On-Ramp

The addition of project traffic would deteriorate the level of service from an acceptable level of service under the Year 2030 No Project conditions to an unacceptable level of service under Year 2030 Plus Project conditions at the following ramp merge/diverge junctions:

- I-5 and SR 151 – SB On-Ramp

The additional I-5 improvements described in **Table 4.3-18**, or improvements modified by subsequent traffic studies in coordination with Caltrans and the Shasta Regional Transportation Agency, would provide acceptable level of service for this ramp junction under Cumulative Year 2030 Plus Project conditions. While mitigation measures **MM 4.3.1c** and **MM 4.3.3** require the project applicant to contribute its fair-share fee to I-5 improvements, Interstate 5 is wholly outside the jurisdiction of the City of Shasta Lake, which does not have the ability to construct improvements on I-5 or on any facility within Caltrans jurisdiction. The DEIR must assume that the improvements are not constructed, and the impacts remain significant and unavoidable. The City is requiring that the project contribute toward I-5 improvements. Yet since I-5 is wholly outside the City of Shasta Lake's jurisdiction, the City cannot be certain that improvements will be made consistent with this DEIR. If the improvement cannot be constructed, the impact is not fully mitigated, and the agency can only conclude that the impact is **cumulatively considerable and significant and unavoidable**.

4.3 TRANSPORTATION AND CIRCULATION

Mitigation Measures

Payment of fair-share contributions as described in mitigation measure **MM 4.3.3**.

Conflict with Applicable Level of Service Due to Wonderland Boulevard Extension – Cumulative Year 2030 Plus Project Conditions (Standards of Significance 1 and 2)

Impact 4.3.17 Implementation of the Wonderland Boulevard southern access extension conceptualized under the project would result in an exceedance of level of service thresholds under Year 2030 Plus Project conditions. This impact would be **cumulatively considerable**.

As previously described, access to the Area Plan is proposed from Wonderland Boulevard and the Mountain Gate interchange with Interstate 5 from the north, and an extension of Wonderland Boulevard to Cascade Boulevard from the south. Wonderland Boulevard would connect to Cascade Boulevard at a “T” intersection with Cascade Boulevard. This southerly extension of Wonderland Boulevard would involve the construction of improvements outside of the main development area of the proposed project.

According to the Traffic Impact Analysis Report (Omni-Means 2008), a southerly connection of Wonderland Boulevard as a “T” intersection with Cascade Boulevard would result in an unacceptable level of service at vicinity intersections.

Mitigation Measures

Mitigation measures **MM 4.3.1a** through **MM 4.3.1d** and **MM 4.3.3**, described above, would improve the level of service at all intersections to acceptable levels under Year 2030 Plus Project conditions. However, two of the intersections are wholly outside the City of Shasta Lake’s jurisdiction (SR 151 Shasta Street and SR 151/I-5 Southbound Ramps). As such, impacts to these intersections are classified as **cumulatively considerable** and **significant and unavoidable** because the City cannot be certain that improvements will be made consistent with this Draft EIR.

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4.4 AIR QUALITY

This section examines the air quality in the City of Shasta Lake, includes a summary of applicable air quality regulations, and analyzes potential air quality impacts associated with the proposed project.

4.4.1 EXISTING SETTING

NORTHERN SACRAMENTO VALLEY AIR BASIN

The proposed project is located in the City of Shasta Lake, which is located in Shasta County at the northern end of the Northern Sacramento Valley Air Basin (NSVAB). The NSVAB consists of a total of seven counties, including Sutter, Yuba, Colusa, Butte, Glenn, Tehama, and Shasta. The NSVAB is bounded on the north and west by the Coastal Mountain Range and on the east by the southern portion of the Cascade Mountain Range and the northern portion of the Sierra Nevada range. These mountain ranges reach heights in excess of 6,000 feet, with peaks rising much higher. The mountains form a substantial physical barrier to locally created pollution as well as that transported northward on prevailing winds from the Sacramento metropolitan area (SVBAPCC 2010).

The valley is often subjected to inversion layers that, coupled with geographic barriers and high summer temperatures, create a high potential for air pollution problems. Generally, Shasta County experiences moderate to very poor capability to disperse pollutants nearly 80 percent of the time. This is, in large measure, due to relatively stable atmospheric conditions that act to suppress vertical air movement. Extremely stable atmospheric conditions, referred to as inversions, act as barriers to pollutants. In valley locations under 1,000 feet elevation, they create a "lid" under which pollutants are trapped. Dust and other pollutants can be trapped within these inversion layers and will not disperse until atmospheric conditions become unstable. This situation creates concentrations of pollutants at or near the ground surface and as a result poses significant health risks for plants, animals, and people (SVBAPCC 2010).

REGIONAL CLIMATE AND ATMOSPHERIC CONDITIONS

The climate of the Northern Sacramento Valley Air Basin, as with all of Central California, is dominated by the strength and location of a semi-permanent, subtropical high-pressure cell over the northeastern Pacific Ocean. Climate is also affected by the temperature-moderating effects of the nearby oceanic heat reservoir. Warm summers, cool winters, rainfall, daytime onshore breezes, and moderate humidity characterize regional climatic conditions. In summer when the high-pressure cell is strongest, temperatures are very warm and humidity is low. The daily incursion of the sea breeze into the Central Valley, however, creates persistent breezes that moderate the summer heat. In winter, when the high-pressure cell is weakest, conditions are characterized by occasional rainstorms interspersed with stagnant conditions and sometimes heavy fog. Airflow patterns in the basin can be characterized by one of eight directional types, the most frequent being northwesterly. Northwest winds are predominant in spring and summer, but seasonal variations do occur. Calm conditions dominate the winter months.

Terrain features create various microclimates. The pattern of mountains and hills in the basin is primarily responsible for the wide variations of rainfall, temperatures, and localized winds that occur throughout the region. Temperature variations have an important influence on basin wind flow, dispersion along mountain ridges, vertical mixing, and photochemistry. Because the temperature-moderating marine influence decreases with distance, monthly and annual temperature variations are greater inland than along the coast.

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Precipitation is highly variable seasonally. Summer months are often dry, averaging less than 1 inch in total precipitation per month. Rainfall is most abundant during the winter months and increases with elevation. Annual rainfall is lowest in the inland valleys, higher in the coastal and inland foothills, and highest in the mountains.

AIR POLLUTANTS AND AMBIENT AIR QUALITY STANDARDS

Criteria Air Pollutants

The air pollutants emitted into the ambient air by stationary and mobile sources are regulated by federal and state law. These regulated air pollutants are known as “criteria air pollutants” and are categorized into primary and secondary pollutants. Primary air pollutants are those that are emitted directly from sources. Carbon monoxide (CO), reactive organic gases (ROG), nitrogen oxides (NO_x), sulfur dioxide (SO₂), most particulate matter (PM₁₀ and PM_{2.5}), lead, and fugitive dust are primary air pollutants. Of these, CO, SO₂, PM₁₀, and PM_{2.5} are criteria pollutants. ROG and NO_x are criteria pollutant precursors and go on to form secondary criteria pollutants through chemical and photochemical reactions in the atmosphere. Ozone (O₃) and nitrogen dioxide (NO₂) are the principal secondary pollutants. Presented below is a description of each of the primary and secondary criteria air pollutants and their known health effects.

Other pollutants, such as carbon dioxide, a natural byproduct of animal respiration that is also produced in the combustion process, have been linked to such phenomena as climate change. Assembly Bill 32 (AB 32) requires the state to reduce emissions to 1990 levels by 2020, which is discussed further in Section 4.13, Greenhouse Gases and Climate Change.

Carbon Monoxide (CO) is a colorless, odorless gas produced by the incomplete combustion of carbon-containing fuels, such as gasoline or wood. CO concentrations tend to be the highest during the winter morning, when little to no wind and surface-based inversions trap the pollutant at ground levels. Because CO is emitted directly from internal combustion engines, motor vehicles operating at slow speeds are the primary source of carbon monoxide in the NSVAB. The highest ambient CO concentrations are generally found near congested transportation corridors and intersections.

Individuals with a deficient blood supply to the heart are the most susceptible to the adverse effects of CO exposure. The effects observed include earlier onset of chest pain with exercise, and electrocardiograph changes indicative of decreased oxygen supply to the heart. Inhaled CO has no direct toxic effect on the lungs, but exerts its effect on tissues by interfering with oxygen transport and competing with oxygen to combine with hemoglobin present in the blood to form carboxyhemoglobin (COHb). Hence, conditions with an increased demand for oxygen supply can be adversely affected by exposure to CO. Individuals most at risk include fetuses, patients with diseases involving heart and blood vessels, and patients with chronic hypoxemia (oxygen deficiency) as seen at high altitudes.

Reduction in birth weight and impaired neurobehavioral development have been observed in animals chronically exposed to CO, resulting in COHb levels similar to those observed in smokers. Recent studies have found increased risks for adverse birth outcomes with exposure to elevated CO levels; these include pre-term births and heart abnormalities.

Reactive Organic Gases (ROG) emissions are precursors in forming ozone and consist of compounds containing methane, ethane, propane, butane, and longer chain hydrocarbons, which are typically the result of some type of combustion/decomposition process. Smog is

formed when reactive organic gases and nitrogen oxides react in the presence of sunlight. ROG's are a criteria pollutant since they are a precursor to ozone, which is a criteria pollutant.

Nitrogen Oxides (NO_x) consist of nitric oxide (NO), nitrogen dioxide (NO_2), and nitrous oxide (N_2O) and are formed when nitrogen (N_2) combines with oxygen (O_2). Their life span in the atmosphere ranges from one to seven days for nitric oxide and nitrogen dioxide, to 170 years for nitrous oxide. Nitrogen oxides are typically created during combustion processes and are major contributors to smog formation and acid deposition. NO_2 is a criteria air pollutant and may result in numerous adverse health effects; it absorbs blue light, resulting in a brownish-red cast to the atmosphere and reduced visibility. Of the seven types of nitrogen oxide compounds, NO_2 is the most abundant in the atmosphere. Because ambient concentrations of NO_2 are related to traffic density, commuters in heavy traffic may be exposed to higher concentrations of NO_2 than those indicated by regional monitors.

Population-based studies suggest that an increase in acute respiratory illness, including infections and respiratory symptoms in children (not infants), is associated with long-term exposure to NO_2 at levels found in homes with gas stoves (which are actually higher than ambient levels found in Southern California, for instance). Increase in resistance to air flow and airway contraction is observed after short-term exposure to NO_2 in healthy subjects. Larger decreases in lung functions are observed in individuals with asthma or chronic obstructive pulmonary disease (e.g., chronic bronchitis, emphysema) than in healthy individuals, indicating a greater susceptibility of these subgroups.

In animals, exposure to levels of NO_2 considerably higher than ambient concentrations results in increased susceptibility to infections, possibly due to the observed changes in cells involved in maintaining immune functions. The severity of lung tissue damage associated with high levels of ozone exposure increases when animals are exposed to a combination of O_3 and NO_2 .

Sulfur Dioxide (SO_2) is a colorless, extremely irritating gas or liquid. It enters the atmosphere as a pollutant mainly as a result of burning high-sulfur-content fuel oils and coal and from chemical processes occurring at chemical plants and refineries. When SO_2 oxidizes in the atmosphere, it forms sulfates (SO_4). Collectively, these pollutants are referred to as sulfur oxides (SO_x).

A few minutes of exposure to low levels of SO_2 can result in airway constriction in some asthmatics, all of whom are sensitive to its effects. In asthmatics, increases in resistance to air flow, as well as reduction in breathing capacity leading to severe breathing difficulties, are observed after acute exposure to SO_2 . In contrast, healthy individuals do not exhibit similar acute responses even after exposure to higher concentrations of SO_2 .

Animal studies suggest that despite SO_2 being a respiratory irritant, it does not cause substantial lung injury at ambient concentrations. However, very high levels of exposure can cause lung edema (fluid accumulation), lung tissue damage, and sloughing off of cells lining the respiratory tract.

Some population-based studies indicate that the mortality and morbidity effects associated with fine particles show a similar association with ambient SO_2 levels. In these studies, efforts to separate the effects of SO_2 from those of fine particles have not been successful. It is not clear whether the two pollutants act synergistically or one pollutant alone is the predominant factor.

PM_{10} (particulate matter less than 10 microns) is a major air pollutant consisting of tiny solid or liquid particles of soot, dust, smoke, fumes, and aerosols. The size of the particles (10 microns or smaller, about 0.0004 inches or less) allows them to easily enter the lungs where they may be

4.4 AIR QUALITY

deposited, resulting in adverse health effects. PM₁₀ also causes visibility reduction and is a criteria air pollutant.

PM_{2.5} (particulate matter less than 2.5 microns) is a similar air pollutant to PM₁₀, consisting of tiny solid or liquid particles that are 2.5 microns or smaller (often referred to as fine particles). These particles are formed in the atmosphere from primary gaseous emissions that include sulfates formed from SO₂ release from power plants and industrial facilities and nitrates that are formed from NO_x release from power plants, automobiles, and other types of combustion sources. The chemical composition of fine particles highly depends on location, time of year, and weather conditions. PM_{2.5} is a criteria air pollutant.

A consistent correlation between elevated ambient fine particulate matter (PM₁₀ and PM_{2.5}) levels and an increase in mortality rates, respiratory infections, the number and severity of asthma attacks, and the number of hospital admissions has been observed in different parts of the United States and various areas around the world. In recent years, some studies have reported an association between long-term exposure to air pollution dominated by fine particles and increased mortality, reduction in life span, and an increased mortality from lung cancer.

Daily fluctuations in PM_{2.5} concentration levels have also been related to hospital admissions for acute respiratory conditions in children, to school and kindergarten absences, to a decrease in respiratory lung volumes in normal children, and to increased medication use in children and adults with asthma. Recent studies show lung function growth in children is reduced with long-term exposure to particulate matter.

The elderly, people with preexisting respiratory or cardiovascular disease, and children appear to be more susceptible to the effects of high levels of PM₁₀ and PM_{2.5}.

Ozone (O₃), or smog, is a highly reactive and unstable gas that is formed when ROG and nitrogen oxides (NO_x), both byproducts of internal combustion engine exhaust, undergo slow photochemical reactions in the presence of sunlight. Ozone concentrations are generally highest during the summer months when direct sunlight, light wind, and warm temperature conditions are favorable to the formation of this pollutant.

Individuals exercising outdoors, children, and people with preexisting lung disease, such as asthma and chronic pulmonary lung disease, are considered to be the most susceptible subgroups for ozone effects. Short-term exposure (lasting for a few hours) to ozone can result in breathing pattern changes, reduction of breathing capacity, increased susceptibility to infections, inflammation of the lung tissue, and some immunological changes. Elevated ozone levels are associated with increased school absences. In recent years, a correlation between elevated ambient ozone levels and increases in daily hospital admission rates, as well as mortality, has also been reported. An increased risk for asthma has been found in children who participate in multiple sports and live in communities with high ozone levels.

Ozone exposure under exercising conditions is known to increase the severity of the responses described above. Animal studies suggest that exposure to a combination of pollutants that includes ozone may be more toxic than exposure to ozone alone. Although lung volume and resistance changes observed after a single exposure diminish with repeated exposures, biochemical and cellular changes appear to persist, which can lead to subsequent lung structural changes.

Lead is a heavy metal that is highly persistent in the environment. In the past, the primary source of lead in the air was emissions from vehicles burning leaded gasoline. Currently, emissions of

lead are largely limited to stationary sources such as lead smelters. It should be noted that the proposed project is not anticipated to generate a quantifiable amount of lead emissions. Lead is a criteria air pollutant.

Fetuses, infants, and children are more sensitive than others to the adverse effects of lead exposure. Exposure to low levels of lead can adversely affect the development and function of the central nervous system, leading to learning disorders, distractibility, inability to follow simple commands, and lower intelligence quotient. In adults, increased lead levels are associated with increased blood pressure.

Lead poisoning can cause anemia, lethargy, seizures, and death, although it appears that there are no direct effects of lead on the respiratory system. Lead can be stored in the bone from early-age environmental exposure, and elevated blood lead levels can occur due to breakdown of bone tissue during pregnancy, hyperthyroidism (increased secretion of hormones from the thyroid gland), and osteoporosis (breakdown of bony tissue). Fetuses and breast-fed babies can be exposed to higher levels of lead because of previous environmental lead exposure of their mothers.

EXISTING AMBIENT AIR QUALITY

Criteria Air Pollutant Monitoring Data

Ambient air quality in the City of Shasta Lake, and thus at the project site, can be inferred from ambient air quality measurements conducted at nearby air quality monitoring stations. Existing levels of ambient air quality and historical trends and projections in the vicinity of Shasta Lake are documented by measurements made by the Shasta County Air Quality Management District (SCAQMD), which is the air pollution regulatory agency for the portion of the NSVAB within Shasta County that maintains air quality monitoring stations processing ambient air quality measurements. These measurements are affected by pollutants generated by the urbanized land uses in the city, the land uses in the areas surrounding the city such as an operational aggregate mine located less than a mile from the Wonderland Boulevard interchange, and land uses from everywhere in the entire NSVAB and beyond.

The nearest long-term air quality monitoring in relation to the project for ozone is carried out by the SCAQMD at the Shasta Lake-13791 Lake Boulevard Monitoring Station. Data for PM₁₀ was obtained from the Shasta Lake-4066 La Mesa Avenue Monitoring Station since this data is not available at the 13791 Lake Boulevard Monitoring Station. The nearest long-term air quality monitoring site in relation to the project for PM_{2.5} is located at the County Health Department building in Redding located approximately 9 miles south of the project site. No other pollutant information, including for CO or NO_x, was available for Shasta County.

Table 4.4-1 summarizes the published data since 2008 from the identified air quality monitoring stations for each year that the monitoring data is provided.

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TABLE 4.4-1
SUMMARY OF AMBIENT AIR QUALITY DATA

Pollutant Standards	2008	2009	2010
Shasta Lake-13790 Lake Boulevard Monitoring Station			
Ozone			
Max 1-hour concentration (ppm)	–	0.081	0.089
Max 8-hour concentration (ppm) (state/federal)	– / –	0.071 / 0.070	0.077 / 0.076
Number of days above state 1-hr standard	–	0	0
Number of days above state/federal 8-hour standard	– / –	1 / 0	13 / 2
Shasta Lake-4066 La Mesa Avenue Monitoring Station			
Respirable Particulate Matter (PM₁₀)			
Max 24-hour concentration (µg/m ³) (state/federal)	104.9 / 108.9	32.2 / 31.9	28.3 / 27.0
Number of days above state/federal standard	19.5 / 0	0 / 0	– / 0
Redding-County Health Department Building, 2650 Breslauer Way			
Fine Particulate Matter (PM_{2.5})			
Max 24-hour concentration (µg/m ³) (state/federal)	200.2 / 200.2	26.2 / 20.2	10.7 / 10.7
Number of days above state/federal standard	– / 29.8	– / 0	– / 0

Source: CARB 2012a

Notes: The “number of days above state/federal standard” statistic is representative of the estimated number of days as if monitoring had occurred every day. µg/m³ = micrograms per cubic meter; ppm = parts per million

– Insufficient or no data currently available to determine the value

Toxic Air Contaminants

In addition to the criteria pollutants discussed above, toxic air contaminants (TACs) are another group of pollutants of concern. TACs are considered either carcinogenic or noncarcinogenic based on the nature of the health effects associated with exposure to the pollutant. For regulatory purposes, carcinogenic TACs are assumed to have no safe threshold below which health impacts would not occur, and cancer risk is expressed as excess cancer cases per one million exposed individuals. Noncarcinogenic TACs differ in that there is generally assumed to be a safe level of exposure below which no negative health impact is believed to occur. These levels are determined on a pollutant-by-pollutant basis.

There are many different types of TACs, with varying degrees of toxicity. Sources of TACs include industrial processes such as petroleum refining and chrome plating operations, commercial operations such as gasoline stations and dry cleaners, and motor vehicle exhaust. Public exposure to TACs can result from emissions from normal operations, as well as from accidental releases of hazardous materials during upset conditions. The health effects of TACs include cancer, birth defects, neurological damage, and death.

To date, the California Air Resources Board (CARB) has designated nearly 200 compounds as TACs. Additionally, CARB has implemented control measures for a number of compounds that pose high risks and show potential for effective control. The majority of the estimated health risks from TACs can be attributed to a relatively few compounds, one of the most important being

particulate matter from diesel-fueled engines. In 1998, CARB identified particulate emissions from diesel-fueled engines (diesel PM) as a toxic air contaminant. Previously, the individual chemical compounds in diesel exhaust were considered as TACs. Almost all diesel exhaust particle mass is 10 microns or less in diameter. Because of their extremely small size, these particles can be inhaled and eventually trapped in the bronchial and alveolar regions of the lungs. Of all controlled toxic air contaminants, emissions of diesel PM are estimated to be responsible for about 70 percent of the total ambient TAC risk. CARB has made the reduction of the public's exposure to diesel PM one of its highest priorities, with an aggressive plan to require cleaner diesel fuel and cleaner diesel engines and vehicles (CARB 2005).

In 2008, the South Coast Air Quality Management District updated a study on ambient concentrations of TACs and estimated the potential health risks from air toxics. The results showed that the overall risk for excess cancer from a lifetime exposure to ambient levels of air toxics was about 1,200 in a million. The largest contributor to this risk was diesel exhaust, accounting for 84 percent of the air toxics risk (South Coast AQMD 2008).

SENSITIVE RECEPTORS

One of the most important reasons for air quality standards is the protection of those members of the population who are most sensitive to the adverse health effects of air pollution, termed "sensitive receptors." Sensitive receptors are locations where they would reside for long periods. Commonly identified sensitive population groups are human populations, especially children, seniors, and the chronically ill, located where there is reasonable expectation of continuous human exposure according to the averaging time for an air quality standard (e.g., 24-hour, 8-hour, 1-hour). Commonly identified sensitive land uses are residences, schools, playgrounds, child-care centers, retirement homes or convalescent homes, hospitals, and clinics.

Existing sensitive land uses located in the vicinity of the project site consist primarily of residential land uses, which are generally located to the south, and Grand Oaks Elementary School located adjacent to the south portion of the proposed project site. The new extension of the project road from Shasta Way will be within approximately 200 feet of Grand Oaks Elementary School. As the project builds out, new sensitive receptors will be created with each new home or commercial structure.

4.4.2 REGULATORY FRAMEWORK

Subsequent development allowed with implementation of the proposed project has the ability to release gaseous emissions of criteria pollutants and dust into the ambient air; therefore, future development activities under the proposed project fall under the ambient air quality standards promulgated on the local, state, and federal levels. The federal Clean Air Act of 1971 and the Clean Air Act Amendments (1977) established the national ambient air quality standards (NAAQS), which are promulgated by the US Environmental Protection Agency (EPA). The State of California has also adopted its own California ambient air quality standards (CAAQS), which are promulgated by CARB. The proposed project is in the Shasta County portion of the NSVAB, which is under the air quality regulatory jurisdiction of the Shasta County Air Quality Management District and is subject to the rules and regulations adopted by the district to achieve attainment with the NAAQS and CAAQS. Federal, state, regional, and local laws, regulations, plans, and guidelines are summarized below.

4.4 AIR QUALITY

AMBIENT AIR QUALITY STANDARDS

The Clean Air Act Amendment of 1971 established NAAQS, with states retaining the option to adopt more stringent standards or to include other pollution species. These standards are the levels of air quality considered to provide a margin of safety in the protection of the public health and welfare. They are designed to protect those sensitive receptors most susceptible to further respiratory distress, such as asthmatics, the elderly, very young children, people already weakened by other disease or illness, and persons engaged in strenuous work or exercise. Healthy adults can tolerate occasional exposure to air pollutant concentrations considerably above these minimum standards before adverse effects are observed.

Both the State of California and the federal government have established health-based ambient air quality standards for six air pollutants. As shown in **Table 4.4-2**, these pollutants include O₃, CO, NO₂, SO₂, PM₁₀, and lead. PM_{2.5} has recently been added to this listing. In addition, the State has set standards for sulfates, hydrogen sulfide, vinyl chloride, and visibility-reducing particles. These standards are designed to protect the health and welfare of the populace with a reasonable margin of safety.

TABLE 4.4-2
AIR QUALITY STANDARDS

Pollutant	Averaging Time	California Standards	National Standards
Ozone	8 Hour	0.070 ppm (137 µg/m ³)	0.075 ppm
	1 Hour	0.09 ppm (180 µg/m ³)	–
Carbon Monoxide	8 Hour	9.0 ppm (10 mg/m ³)	9 ppm (10 mg/m ³)
	1 Hour	20 ppm (23 mg/m ³)	35 ppm (40 mg/m ³)
Nitrogen Dioxide	1 Hour	0.18 ppm (339 µg/m ³)	100 ppb
	Annual Arithmetic Mean	0.030 ppm (57 µg/m ³)	53 ppb (100 µg/m ³)
Sulfur Dioxide	24 Hour	0.04 ppm (105 µg/m ³)	N/A
	3 Hour	–	N/A
	1 Hour	0.25 ppm (665 µg/m ³)	75 ppb
Particulate Matter (PM ₁₀)	Annual Arithmetic Mean	20 µg/m ³	N/A
	24 Hour	50 µg/m ³	150 µg/m ³
Particulate Matter – Fine (PM _{2.5})	Annual Arithmetic Mean	12 µg/m ³	15 µg/m ³
	24 Hour	N/A	35 µg/m ³
Sulfates	24 Hour	25 µg/m ³	N/A
Lead	Calendar Quarter	N/A	1.5 µg/m ³
	30 Day Average	1.5 µg/m ³	N/A
Hydrogen Sulfide	1 Hour	0.03 ppm (42 µg/m ³)	N/A
Vinyl Chloride (chloroethene)	24 Hour	0.01 ppm (26 µg/m ³)	N/A
Visibility-Reducing Particles	8 Hour (10:00 to 18:00 PST)	–	N/A

Source: CARB 2012b

Notes: mg/m³ = milligrams per cubic meter; ppm = parts per million; ppb = parts per billion; µg/m³ = micrograms per cubic meter

AIR QUALITY MANAGEMENT PLAN

In 1994, the air districts in the Northern Sacramento Valley Planning Area (NSVPA), a subsection of the greater Sacramento Valley Air Basin that includes the SCAQMD jurisdiction, prepared an Air Quality Attainment Plan for ozone. This plan was updated in 1997, 2000, 2003, 2006, and again in 2009. Like the preceding plans, the 2009 plan focuses on the adoption and implementation of control measures for stationary sources, area-wide sources, indirect sources, and public information and education programs. The 2009 plan also addresses the effect that pollutant transport has on the NSVPA's ability to meet and attain the state standards.

The Air Quality Attainment Plan provides local guidance for the State Implementation Plan (SIP), which provides the framework for air quality basins to achieve attainment of the state and federal ambient air quality standards. Areas that meet ambient air quality standards are classified as attainment areas, while areas that do not meet these standards are classified as nonattainment areas. Severity classifications for ozone nonattainment range in magnitude: marginal, moderate, serious, severe, and extreme. Areas for which there is insufficient data available are designated unclassified. The attainment status for the Shasta County portion of the NSVAB is included in **Table 4.4-3**.

TABLE 4.4-3
ATTAINMENT STATUS OF CRITERIA POLLUTANTS IN SHASTA COUNTY

Pollutant	State Designation	Federal Designation
O ₃	Nonattainment	Unclassified/Attainment
PM ₁₀	Nonattainment	Unclassified
PM _{2.5}	Attainment	Unclassified/Attainment
CO	Unclassified	Unclassifiable/Attainment
NO ₂	Attainment	Unclassifiable/Attainment
SO ₂	Attainment	Unclassified
Lead	Attainment	Unclassifiable/Attainment

Source: CARB 2012c

As shown in **Table 4.4-3**, the Shasta County portion of the NSVAB is designated as a nonattainment area for O₃ and PM₁₀ for state standards. The Shasta County portion of the NSVAB is designated as being unclassified and/or attainment for all pollutants under federal standards.

Shasta County Air Quality Management District

The SCAQMD is designated by law to adopt and enforce regulations to achieve and maintain ambient air quality standards. The SCAQMD, along with other air districts in the Northern Sacramento Valley Air Basin, has committed to jointly prepare the NSVAB Air Quality Attainment Plan for the purpose of achieving and maintaining healthful air quality throughout the air basin. In addition, the SCAQMD adopts and enforces controls on stationary sources of air pollutants through its permit and inspection programs, and it regulates agricultural burning. Other responsibilities include monitoring air quality, preparing clean air plans, and responding to citizen complaints concerning air quality.

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All projects in Shasta County and in the City of Shasta Lake are subject to applicable SCAQMD rules and regulations in effect at the time of construction. Descriptions of specific rules applicable to future construction resulting from implementation of the proposed project may include, but are not limited to:

- Architectural coatings and solvents used at the project shall be compliant with SCAQMD Rule 3-31, Architectural Coatings.
- Cutback and emulsified asphalt application shall be conducted in accordance with SCAQMD Rule 3-15, Cutback and Emulsified Asphalt.
- SCAQMD Rule 3-23, Fireplace and Solid Fuel Heating Device Usage, prohibits installation of any new non-EPA-certified Phase II device.
- SCAQMD Rule 3-16, Fugitive, Indirect, or Non-Traditional Sources, controls the emission of fugitive dust during earth-moving, construction, demolition, bulk storage, and conditions resulting in wind erosion.

The SCAQMD recommends that projects apply Standard Mitigation Measures (SMM) and appropriate Best Available Mitigation Measures (BAMM) when a project exceeds Level A thresholds, and that projects apply SMM, BAMM, and special BAMM when a project exceeds Level B thresholds (Level A and Level B thresholds are defined below). SMMs and BAMMs are described in **Table 4.4.4**.

TABLE 4.4-4
SHASTA COUNTY AIR QUALITY MANAGEMENT DISTRICT
STANDARD AND BEST AVAILABLE OPERATIONAL MITIGATION MEASURES

Standard Mitigation Measures Applicable to All Projects
Energy Conservation
1. The project shall provide for the use of energy-efficient lighting (includes controls) and process systems such as water heaters, furnaces, and boiler units.
2. The project shall utilize a central water heating system featuring use of low-NOx hot water heaters, where practical.
3. The project shall utilize energy-efficient and automated controls for air conditioning.
PM₁₀ Controls
4. All new wood-burning devices shall be EPA Phase II certified.
5. Residential structures shall include exterior electric outlets in the front and rear.
Transit
6. Streets shall be designed to maximize pedestrian access to transit stops where feasible.
7. Large residential, commercial, and industrial projects should include bus shelters at transit access points where feasible and deemed appropriate by local transportation planning agencies.
Best Available Mitigation Measures for Residential Projects
Level A Measures
The project shall implement all applicable Standard Mitigation Measures and Level "A" Measures.
The project shall contribute to traffic flow improvements (i.e., right-of-way, capital improvements, etc.) that reduce emissions and are not considered as substantially growth inducing.

Level B Measures
The project shall implement all applicable Standard Mitigation Measures.
The project shall provide for the orientation of building structures that maximize the potential for natural cooling and passive solar design principles (this may include use of appropriate landscaping).
The project site shall include the installation of solar water heaters for at least 25 percent of the residential units in the development.
Land Use
The project shall incorporate mixed uses, where permitted by local development regulations, to achieve a balance of commercial, employment, and housing options within the project site.
The project shall provide for neighborhood park(s) or other recreational options such as trails within the development to minimize vehicle travel to off-site recreational uses and/or commercial uses.
The project shall provide densities of nine units per acre or greater, where allowed by the General Plan and/or Zone Plan, along bus routes and at bus stops to encourage transit use.
Ancillary Services
The project shall include neighborhood retail sales and services within or adjacent to residential subdivisions as permitted by local development regulations.
Transit
The project shall provide for on-site road and off-site bus turnouts, passenger benches, and shelters as demand and service routes warrant subject to review and approval by local transportation planning agencies.
The project shall be required to contribute a proportionate share to the development and/or continuation of a regional transit system. Contributions could consist of dedicated right-of-way, capital improvements, easements, etc.
Streets
The project shall provide for synchronized traffic signals along streets impacted by project development as deemed necessary by local transportation planning agencies.
The project shall provide a street pattern featuring direct, rather than circuitous, access routes through a subdivision.
The project shall include a street pattern that provides for an efficient circulation route for buses and accommodates other public transportation vehicles on key road networks.
Pedestrian
The project shall provide for pedestrian access between bus service and major transportation points within the project where deemed feasible.
The project shall provide for off-site pedestrian facility improvements such as overpasses and wider sidewalks as deemed appropriate and feasible by local transportation planning agencies.
The project shall provide for reduced walking distances between residences and bus stops, abutting activity centers, schools, parks and similar uses.
Bikeways
The project shall provide for, contribute to, or dedicate land for the provision of off-site bicycle trails linking the facility to designated bicycle commuting routes in accordance with an adopted citywide or countywide bikeway plan.
Telecommunications
The project shall include, provide for, or otherwise contribute toward the development of a neighborhood telecommunication or telework center.

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Best Available Mitigation Measures for Commercial/Industrial Projects
The project shall implement all applicable Standard Mitigation Measures.
Energy Conservation
The project shall provide for the orientation of building structures to the north for natural cooling and the use of appropriate landscaping that maximizes the potential of passive solar design principles.
The project shall include provisions for the use of fleet vehicles that use clean-burning fuels as may be practicable.
The project shall include the installation of solar water heater for at least 25 percent of the building floor area.
The project shall improve the thermal efficiency of commercial and industrial structures as appropriate by: (1) reducing thermal load with automated and timed temperature controls, or (2) occupancy load limits.
The project shall incorporate shade trees, adequate in number and proportional to the project size, throughout the project site to reduce building heating and cooling requirements.
Land Use
The project shall incorporate mixed uses (including residential living units) where permitted by the General Plan and/or the Zone Plan, to achieve a balance of commercial, employment, and housing options within the project site.
The project shall provide for a development pattern that features pedestrian uses at street level within mixed use developments to promote use of nearby bus routes and facilities.
The project shall provide for reduced setbacks for retail, employment, and multi-family land uses on streets with bus services.
The project shall provide for the arrangement of buildings to reduce the walking distance between each of the buildings and the nearest transit facility.
The project shall provide a development pattern that discourages auto-oriented uses in areas adjacent to bus stops and other transit facilities.
The project shall orient building and main entrances to streets with bus services.
Ancillary Services
The project shall provide for and/or include on-site services such as cafeterias, food vending machines, automatic tellers, etc., as appropriate and in compliance with local development regulations.
The project shall include a lunch shuttle service from a worksite(s) to food establishments.
The project shall provide on-site child care and after school facilities or contribute to off-site development of such facilities within walking distance of the project.
The project shall provide shuttle service to major transit stations and multi-modal centers.
Pedestrian
The project shall provide on-site pedestrian facility improvements such as walking paths and building access which are physically separated from street and parking lot traffic.
The project shall provide for a development pattern that eliminates physical barriers such as walls, berms, landscaping, and slopes between residences and buildings and transit stops, or that impede the use of bicycle or pedestrian circulation.
The project shall provide for a parking lot design that does not impede a clear, direct pathway for safe, easy movement of pedestrians and public transportation vehicles.
The project shall be responsible for constructing offsite pedestrian facility improvements such as overpasses, wider sidewalks, etc.
The project shall provide for shower facilities for pedestrian employee's use.

Bikeways
The project shall provide shower/locker facilities, where appropriate, for bicycling and pedestrian commuters.
The project shall provide for the construction of off-site bicycle and pedestrian facility improvements such as trails linking them to designated pedestrian/bicycle commuting routes and/or on-site bike paths as deemed appropriated by local transportation planning agencies.
The project shall provide for adequate bicycle storage/parking facilities at a minimum of one bicycle space for every 20 automobile spaces.
Streets
The project shall provide for synchronized traffic signals, as deemed necessary by local transportation planning agencies, along streets impacted by project development.
The project shall contribute to traffic-flow improvements that are deemed not to be substantially growth-inducing.
Transit
The project shall provide for and/or incorporate transit-use incentives, as approved by applicable transportation planning agencies, such as subsidized transit passes and accommodation of unusual work schedules to encourage transit use.
The project shall provide for on-site road and off-site bus turnouts, passenger benches, and shelters as demand and service routes warrant subject to review and approval by local transportation planning agencies.
The project shall design interior major streets to serve the main entrances to buildings.
The project shall contribute via a series of AQMD and RABA approved alternative measures (e.g., right-of-way dedications, cash-in-lieu payments, capital improvements, etc.) to development and/or maintenance of the existing transit system.
Parking
The project shall contribute to construction of off-site park-n-ride lots as deemed feasible and appropriate by appropriate Shasta County transportation agencies.
The project shall provide preferential parking spaces for carpools and van pools.
The project shall use any excess parking over Zone Code requirements as on-site park-n-ride lots or contribute to construction of off-site lots.
Telecommunications
The project shall provide video conferencing facilities as deemed appropriate, or feasible.
The project shall develop and implement a home-based telecommuting program.
The project shall provide for telecommuting or alternative transportation programs such as Caltrans rideshare where deemed appropriate by local transportation planning agencies and/or AQMD.
Work Schedules
The project shall include the use of alternative work schedules such as compressed work week schedules where weekly work hours are compressed into fewer than five days. Examples are 9/80; 4/40; 3/36.

Source: SCAQMD, undated. Notes: Other comparable mitigation measures may be used in lieu of or in conjunction with the measures listed above. Where additional measures are contemplated, they must be reviewed and approved for use by the AQMD. Where questions arise as to the suitability of any proposed mitigation measure, they shall be referred to the AQMD for determination of its acceptability.

TOXIC AIR CONTAMINANT REGULATIONS

In 1983, the California Legislature enacted a program to identify the health effects of TACs and to reduce exposure to these contaminants to protect the public health. The Health and Safety Code defines a TAC as “an air pollutant which may cause or contribute to an increase in

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mortality or in serious illness, or which may pose a present or potential hazard to human health.” A substance that is listed as a hazardous air pollutant pursuant to subsection (b) of Section 112 of the federal Clean Air Act (42 USC Section 7412[b]) is a toxic air contaminant. Under state law, the California Environmental Protection Agency (CalEPA), acting through CARB, is authorized to identify a substance as a toxic air contaminant if it determines the substance is an air pollutant that may cause or contribute to an increase in mortality or to an increase in serious illness, or may pose a present or potential hazard to human health.

California regulates TACs primarily through Assembly Bill (AB) 1807 (Tanner Air Toxics Act) and AB 2588 (Air Toxics Hot Spot Information and Assessment Act of 1987). The Tanner Air Toxics Act sets forth a formal procedure for CARB to designate substances as toxic air contaminants. Once a TAC is identified, CARB adopts an “airborne toxics control measure” for sources that emit designated TACs. If there is a safe threshold for a substance (a point below which there is no toxic effect), the control measure must reduce exposure to below that threshold. If there is no safe threshold, the measure must incorporate toxics best available control technology to minimize emissions. CARB has, to date, established formal control measures for eleven TACs, all of which are identified as having no safe threshold.

Air toxics from stationary sources are also regulated in California under the Air Toxics Hot Spot Information and Assessment Act of 1987. Under AB 2588, toxic air contaminant emissions from individual facilities are quantified and prioritized by the air quality management district or air pollution control district. High priority facilities are required to perform a health risk assessment and, if specific thresholds are exceeded, are required to communicate the results to the public in the form of notices and public meetings.

Since the last update to the TAC list in December 1999, CARB has designated 244 compounds as toxic air contaminants (CARB 1999). Additionally, CARB has implemented control measures for a number of compounds that pose high risks and show potential for effective control. The majority of the estimated health risks from TACs can be attributed to relatively few compounds, the most important being particulate matter from diesel-fueled engines.

CITY OF SHASTA LAKE GENERAL PLAN

The Air Quality Element of the City’s General Plan was adopted in 1995 and underwent slight revisions to its objectives, policies, and implementation measures in 1999 as part of an overall General Plan update. For example, Policy AQ-b was revised to require that new projects incorporate SCAQMD Standard Mitigation Measures and Best Available Mitigation Measures when significance thresholds are exceeded. The revised objectives, policies, and implementation measures of the 1995 Air Quality Element are listed in the Public Health and Safety Group of the 1999 City of Shasta Lake General Plan document. The General Plan serves as the overall guiding policy document for the City. A summary of the project’s consistency with applicable General Plan air quality-related objectives and policies is contained in **Table 4.4-5**. While this Draft EIR analyzes the project’s consistency with the General Plan pursuant to California Environmental Quality Act (CEQA) Section 15125(d), it is the City of Shasta Lake Planning Commission and/or City Council that will make the determination of the project’s consistency with the identified General Plan policies.

**TABLE 4.4-5
PROJECT CONSISTENCY WITH CITY OF SHASTA LAKE
GENERAL PLAN: AIR QUALITY**

General Plan Objectives & Policies	Consistent with General Plan?	Analysis
Air Quality Objectives		
AQ-1 Improve and maintain air quality to protect human health and preclude damage to plants and property.	Yes, with mitigation	The proposed project incorporates all measures recommended by the Shasta County Air Quality Management District. Additional measures have also been incorporated, beyond those recommended by the SCAQMD to further reduce the project’s contribution to regional and local air quality impacts.
AQ-2 Meet applicable California air quality standards and avoid violating Federal air quality standards.		
AQ-3 Encourage integration of land use, transportation, and energy planning efforts which help to reduce air pollution.		
AQ-4 Improve the design of proposed development to reduce potential air pollution.		
Air Quality Policies		
AQ-a The City shall strive to meet and/or maintain applicable State and Federal air quality standards.	Yes, with mitigation	Mitigation measures have been incorporated to reduce emissions of ozone-precursor pollutants, as well as emissions of airborne particulate matter. Development of proposed land uses would be required to implement standard and best available mitigation measures recommended by the SCAQMD. Additional measures have also been included to further reduce project-related emissions (see mitigation measures MM 4.4.1, MM 4.4.2, MM 4.4.3a, and MM 4.4.3b).
AQ-b Land use decisions shall be made with consideration given to the improvement of air quality. New development projects shall be conditioned to reduce air quality impacts. <i>Standard Mitigation Measures</i> and <i>Best Available Mitigation Measures</i> shall be incorporated into new projects when thresholds are exceeded. The City should consult with the Air Quality Management District regarding mitigation of air quality impacts.		
AQ-c All parcels created by new land divisions and new multi-family residential, commercial and industrial development (or with expansion of such uses) shall be served by paved roads, driveways, and parking areas. A comprehensive plan shall be developed by the City that establishes when a road paving deferral should be granted, for what period of time, standards for determining the fair share of a paving requirement, and the level or standard of the paving work.	Yes, with mitigation	Mitigation measures have been included to require paved road surfaces. To reduce emissions of fugitive dust during construction associated with equipment traveling on unpaved surfaces, the paving of road surfaces shall be completed as early in the construction process as possible (see mitigation measure MM 4.4.1).
AQ-d Encourage a land use pattern that reduces reliance on the automobile and encourages alternative modes of transportation for travel to employment and shopping by encouraging: • infill development • mixed-use development near employment centers (day care, restaurant, and bank) • increased residential densities near employment and shopping, and along major traffic corridors • employment opportunities and shopping near to residential development	Yes, with mitigation	The proposed project includes a mix of land uses. Mitigation measures requiring the application of SCAQMD Best Available Mitigation Measures have been incorporated which promote accessibility of on-site land use to nearby services, including promotion of pedestrian movement, bicycling, and public transit (see Impact 4.4.3).
AQ-e Encourage a reduction in vehicle trips and vehicle		

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General Plan Objectives & Policies	Consistent with General Plan?	Analysis
miles traveled by encouraging: • public transportation • carpooling, ridesharing, and vanpooling • shortened and combined motor vehicle trips for work, shopping, and services • use of bicycles • pedestrian access and walking		
AQ-f Encourage pedestrian-oriented and transit-oriented design in new development.		
AQ-n Discourage the use of wood burning stoves that do not meet current EPA standards.	Yes, with mitigation	Mitigation has been incorporated to prohibit the use of wood-burning stoves and fireplaces (see mitigation measure MM 4.4.3a).

As shown in **Table 4.4.5**, the proposed Area Plan would not conflict with the City of Shasta Lake General Plan.

4.4.3 IMPACTS AND MITIGATION MEASURES

STANDARDS OF SIGNIFICANCE

Per Appendix G of the California Environmental Quality Act (CEQA) Guidelines, air quality impacts are considered significant if implementation of the proposed project would:

- 1) Conflict with or obstruct implementation of an applicable air quality plan.
- 2) Violate any air quality standard or contribute substantially to an existing or projected air quality violation.
- 3) Expose sensitive receptors to substantial pollutant concentrations.
- 4) Create objectionable odors affecting a substantial number of people.
- 5) Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is nonattainment under an applicable federal or state ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors).

As determined in the Initial Study prepared for the proposed project, implementation of the proposed project would not result in impacts associated with odors. Therefore, this impact (Standard of Significance 4) will not be addressed further in this Draft EIR.

SCAQMD thresholds have also been used to determine air quality impacts in this analysis. To assist local jurisdictions in the evaluation of air quality impacts, the SCAQMD has adopted air quality thresholds for determination of impact significance for projects subject to CEQA review. These thresholds are consistent with the New Source Review Rule 2-1 adopted by the Air Pollution Control Board in 1993 as required by the California Clean Air Act. The thresholds of significance are summarized in **Table 4.4-6**. The SCAQMD recommends that projects apply

Standard Mitigation Measures (SMM) and appropriate Best Available Mitigation Measures (BAMM) when a project exceeds Level A thresholds, and that projects apply SMM, BAMM, and special BAMM (described in **Table 4.4.4** above) when a project exceeds Level B thresholds.

TABLE 4.4-6
SHASTA COUNTY AQMD THRESHOLDS OF SIGNIFICANCE

Threshold	Emissions (lbs/day)		
	NO _x	ROG	PM ₁₀
Level A Thresholds	25	25	80
Level B Thresholds	137	137	137

Source: SCAQMD, undated

METHODOLOGY

Air quality impacts were assessed in accordance with methodologies recommended by CARB and the SCAQMD. Where quantification was required, emissions were modeled using the California Emissions Estimator Model (CalEEMod). CalEEMod is a statewide land use emissions computer model designed to quantify potential criteria pollutant emissions associated with both construction and operations from a variety of land use projects. CalEEMod contains default values for much of the information needed to calculate emissions. However, project specific, user supplied information can also be used when it is available. Vehicle trip generation rates and trip distances for proposed land uses were adjusted to reflect project-specific data obtained from the traffic analysis prepared for the proposed project, which includes vehicle trips for residences and employees associated with residential area and commercial center. The CalEEMod model was run to calculate daily emissions during the summer and winter months. The CalEEMod output is included as **Appendix 4.4-1**.

A formal health risk assessment is necessary for projects anticipated to emit state or federal identified toxic air contaminants (TACS)/hazardous air pollutants (HAPs). For typical land use projects that do not propose stationary source of emissions (e.g., smoke stacks), diesel fueled particulates (diesel PM) are the primary TAC of concern. Land uses that generate substantial amounts of diesel PM include warehouses, distribution centers, etc. The proposed project does not propose any major sources of stationary emissions or warehouses, distribution centers, or other uses requiring substantial amounts of diesel traffic. Therefore, a formal health risk assessment was not conducted for this DEIR.

IMPACTS AND MITIGATION MEASURES

Conflict with or Obstruct Implementation of the NSVPA 2009 Air Quality Attainment Plan (Standard of Significance 1)

Impact 4.4.1 Subsequent land use activities associated with implementation of the proposed Area Plan would potentially conflict with the City General Plan and/or obstruct implementation of the Northern Sacramento Valley Planning Area 2009 Air Quality Attainment Plan. This impact is considered to be **potentially significant**.

As part of its enforcement responsibilities, the EPA requires each state with nonattainment areas to prepare and submit a State Implementation Plan (SIP) that demonstrates the means to attain

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the federal standards. The SIP must integrate federal, state, and local plan components and regulations to identify specific measures to reduce pollution in nonattainment areas, using a combination of performance standards and market-based programs. Similarly, under state law, the California Clean Air Act requires an air quality attainment plan to be prepared for areas designated as nonattainment with regard to the federal and state ambient air quality standards. Air quality attainment plans outline emissions limits and control measures to achieve and maintain these standards by the earliest practical date.

The NSVPA 2009 Air Quality Attainment Plan is the most recent air quality planning document for Shasta County and constitutes the region's State Implementation Plan. SIPs are a compilation of new and previously submitted plans, programs (such as monitoring, modeling, permitting, etc.), district rules, state regulations, and federal controls describing how the state will attain national ambient air quality standards (NAAQS) for pollutants of concern. State law makes the California Air Resources Board the lead agency for all purposes related to the SIP. Local air districts prepare SIP elements and submit them to CARB for review and approval. The NSVPA 2009 Air Quality Attainment Plan includes forecast ROG and NO_x emissions (ozone precursors) for the entire Northern Sacramento Valley Planning Area through the year 2020. These emissions are not appropriated by county or municipality.

Implementation of the proposed Area Plan could increase population and vehicle miles traveled, and thus ROG and NO_x emissions, which could conflict with air quality planning efforts associated with the NSVPA 2009 Air Quality Attainment Plan. The Air Quality Attainment Plan cites projected O₃ precursor emissions (ROG and NO_x) through the year 2020. For the purposes of this analysis, the resulting emissions of the Area Plan's assumption of its theoretical buildout (with mitigation) was quantified and compared with the NSVPA 2009 Air Quality Attainment Plan 2020 ozone precursor emissions projections.

The NSVPA 2009 Air Quality Attainment Plan includes control strategies necessary to attain the California ozone standard at the earliest practicable date, as well as developed emissions inventories and associated emissions projections for the Northern Sacramento Valley Planning Area showing a downtrend for both ROG and NO_x. Implementation of the proposed Area Plan will result in long-term emissions from area and mobile emission sources associated with future growth. As illustrated in **Table 4.4-9**, the ozone precursor emissions, ROG and NO_x, would increase with buildout of the Area Plan. The upward trend in O₃ precursor emissions is not reflective of the projected ozone emissions reductions documented in the NSVPA 2009 Air Quality Attainment Plan, which projects a 5.6 percent reduction in ROG emissions and a 22.3 percent reduction in NO_x emissions from area and mobile sources in the Northern Sacramento Valley Planning Area by the year 2020 (the latest year projected in the NSVPA 2009 Air Quality Attainment Plan). However, while buildout of the proposed project would result in an increase of O₃ precursor emissions, this increase would only total approximately 0.45 tons of ROG and 0.09 tons of NO_x daily (see **Appendix 4.4-1**). Adding these emissions projections to the area and mobile source projections documented in the NSVPA 2009 Air Quality Attainment Plan for year 2020 results in a 5.3 percent reduction in ROG emissions and a 22.2 percent reduction in NO_x emissions from area and mobile sources in the NSVPA. This represents a 0.3 percent increase in ROG emissions and a 0.1 percent increase in NO_x emissions in the NSVPA as a result of the proposed project.

Mitigation Measures

- MM 4.4.1** All development projects located within the Mountain Gate at Shasta Area Plan shall adhere to all applicable SCAQMD rules and regulations during both construction and operation.

Timing/Implementation: Ongoing

Enforcement/Monitoring: City of Shasta Lake Development Services Department; Shasta County Air Quality Management District

It is the intent of the NSVPA 2009 Air Quality Attainment Plan to achieve ozone attainment status. While O₃ precursor emissions are projected to increase as a result of the Area Plan, this increase is minimal to the point of being insubstantial, because buildout of the Area Plan would represent a 0.3 percent increase in ROG emissions and a 0.1 percent increase in NO_x emissions in the Northern Sacramento Valley Planning Area. Furthermore, implementation of SCAQMD rules and regulations, notably Rule 3-23, Fireplace and Solid Fuel Heating Device Usage, which prohibits the installation of any new non-EPA-certified Phase II device such as an open fireplace, would prevent, reduce, and minimize potential air quality impacts (see mitigation measure **MM 4.4.3a** below). The SCAQMD monitors air quality, prepares clean air plans, and responds to citizen complaints concerning air quality. Furthermore, all projects in Shasta County and in the City of Shasta Lake are subject to applicable SCAQMD rules and regulations in effect at the time of construction. For instance, no person shall cause or allow emissions of fugitive dust from any active or inactive operation such that the dust emission exceeds 20 percent opacity or that the dust remains visible 5 percent (5 percent opacity or above) in the atmosphere beyond the property line of the emission source, as regulated under SCAQMD Rule 3-16, Fugitive, Indirect, or Non-Traditional Source.

As previously stated, the proposed Area Plan would not conflict with the City of Shasta Lake General Plan. Therefore, since the increase of O₃ precursor emissions would have a statistically unsubstantial effect on the emissions projections of the NSVPA 2009 Air Quality Attainment Plan, this impact is considered **less than significant** with the additional application of SCAQMD control strategies such as Rule 3-23 and Rule 3-16, as required by mitigation measure **MM 4.4.1** and **MM 4.4.3a**.

Short-Term Construction Generated Pollutant Emissions Resulting in Violation of Air Quality Standards or Contributing to Existing Violations (Standard of Significance 2)

Impact 4.4.2 Construction activities such as clearing, excavation and grading operations, construction vehicle traffic, and wind blowing over exposed earth would generate exhaust emissions and fugitive particulate matter emissions that would temporarily affect local air quality for adjacent land uses. This will result in a **significant** impact.

Construction associated with the proposed Area Plan would generate short-term emissions of criteria air pollutants. The criteria pollutants of primary concern within the project area include ozone-precursor pollutants (i.e., ROG and NO_x) and PM₁₀. Construction-generated emissions are short term and of temporary duration, lasting only as long as construction activities occur, but have the potential to represent a significant air quality impact.

Development of the Mountain Gate at Shasta Area Plan would include development of approximately 1,604 residential units, 195,584 square feet of nonresidential uses, and 236 acres of park and open space uses. The construction and development of residential, nonresidential, and park and open space uses would result in the temporary generation of emissions resulting from site grading and excavation, road paving, motor vehicle exhaust associated with construction equipment and worker trips, and the movement of construction equipment, especially on unpaved surfaces. Emissions of airborne particulate matter are largely dependent

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on the amount of ground disturbance associated with site preparation activities as well as weather conditions and the appropriate application of water.

Detailed construction schedules and equipment requirements are not currently known. However, depending on how development proceeds, construction-generated emissions associated with development occurring within the project area could potentially exceed SCAQMD thresholds of significance. Construction-generated emissions associated with each of the anticipated “areas” of the three construction phases of the proposed project were calculated using the CARB-approved CalEEMod computer program, which is designed to model emissions for land use development projects, based on typical construction requirements. Modeling was based primarily on the default settings contained within the computer program for Shasta County. Construction equipment requirements and usage rates used in the model were based on model default assumptions. Predicted maximum daily construction-generated emissions for the proposed development project are summarized in **Table 4.4-7**.

It is important to note that the proposed Area Plan does not include any provisions that require that its growth potential be attained. Not all of the identified land will be available for development at any given time based on site readiness, environmental constraints, market changes, and other factors. This impact discussion assumes full growth potential under the proposed project in order to present the maximum amount of pollutant emissions possible.

TABLE 4.4-7
SUMMARY OF UNCONTROLLED CONSTRUCTION-GENERATED EMISSIONS¹

Project Phase	Maximum Emissions (lbs/day)			
	ROG	NOx	PM ₁₀	PM _{2.5}
<u>Phase I</u>				
Off-Site Water Storage (20,000 square feet)	3.51	27.24	2.22	1.76
Area C – 7.3-acre park	5.75	57.74	21.35	12.85
Area D – 176 medium-density residential units on 27.9 acres	126.01	80.86	21.35	12.85
Area E – 142 medium-density residential medium units on 22.5 acres	127.79	80.86	21.35	12.85
Area F – 30 very low density residential units on 16.3 acres	56.76	80.86	21.35	12.85
Area G – 392 medium-density residential units on 43.5 acres	167.03	80.86	21.35	12.85
Area H – 73,606 square feet of mixed use commercial, 215 high density residential units, and fire station on 16.9 acres	176.55	57.74	10.66	6.98
<u>Phase II</u>				
Area A – 121,968 square feet of commercial on 11.2 acres	94.80	80.86	21.35	12.85
Area I – 46 medium-density residential units on 7.3 acres	72.52	57.74	21.35	12.85
Area J – 51 medium-density residential units on 8.1 acres	86.09	57.74	21.35	12.85
Area K – 7.6-acre park	5.75	57.74	21.35	12.85
Area L – 61 low-density residential units on 17.1 acres	115.00	80.86	21.35	12.85
Area O – 47 low-density residential units on 13.1 acres	88.70	80.86	21.35	12.85
<u>Phase III</u>				

Project Phase	Maximum Emissions (lbs/day)			
	ROG	NO _x	PM ₁₀	PM _{2.5}
Off-Site Road Extension – project site to Shasta Dam Boulevard	1.90	12.56	1.76	1.32
Area M – 70 low-density residential units on 19.4 acres and 13-acre park	114.05	80.86	21.35	12.85
Area N – 41 very low density residential units on 11.3 acres	77.43	80.86	21.35	12.85
Area P – 119 very low density residential units on 32.9 acres	134.57	80.86	21.35	12.85
Area Q – 19 very low density residential units and electric substation on 12.4 acres	59.71	80.86	21.35	12.85
Area R – 122 high density residential units on 4.5 acres	128.04	57.74	21.35	12.85
Area S – 73 very low density residential units on 40.5 acres	75.16	80.86	21.35	12.85
SCAQMD Level A/B Thresholds	25/137	25/137	80/137	None
Individual Project Areas Exceed SCAQMD Level A/B Thresholds?	Yes/Yes	Yes/No	No/No	NA

Notes: Individual construction of project areas may or may not occur on the same day. Calculated emissions include on- and off-site exhaust emissions and fugitive dust emissions based on default parameters contained in the CalEEMod computer model. Due to irregularities in the modeling software painting phase defaults, duration of painting phases set at 10 percent of building construction phase timeline. The CalEEMod output is included as Appendix 4.4-1.

Based on the modeling conducted, estimated short-term daily emissions of NO_x, PM₁₀, and PM_{2.5} associated with the individual project areas of each of the three anticipated phases would not exceed the SCAQMD-recommended Level B significance threshold; however, the Level A significance threshold would be surpassed. Furthermore, estimated short-term daily emissions of ROG would exceed Level A and Level B thresholds during the construction of Area G and Area H. Also, it is important to note that actual daily emissions would vary from day to day and would be dependent on the activities conducted. Therefore, although the development of individual areas of the proposed project may not generate short-term emissions in an amount to exceed the SCAQMD Level B significance threshold, it is possible that several areas would be under construction simultaneously and would generate cumulative construction emissions that could surpass this threshold and impact air quality. As such, construction-generated emissions of ROG, NO_x, and PM₁₀ could potentially exceed the SCAQMD's recommended Level B significance threshold. As a result, this impact is considered **significant** and is subject to mitigation.

The SCAQMD requires that all development projects apply SMM and BMM when projected air pollutants exceed Level A thresholds. SMM and BMM reduce construction-related air quality impacts by avoiding and/or reducing air pollutant emissions. SMM and BMM reduce environmental impacts and can minimize construction costs. The appropriate type and number of BMM applied to a project is based on the unique characteristics of the project and will be selected from a list of measures kept updated by the Shasta County Planning Department and the SCAQMD. When projects exceed Level B thresholds, as is possible in the case of the proposed Area Plan, the SCAQMD requires the application of SMM, BMM, and special BMM. The SCAQMD will advise the Shasta County Planning Department of the efficiency of project-related construction-related emission measures as part of the effort to reduce emissions below Level B thresholds. In other words, the SCAQMD will assist the Shasta County Planning Department in the effort to reduce unmitigated emissions exceeding 137 pounds per day. If construction-related emissions cannot be reduced to below Level B thresholds, emission offsets may be required.

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Mitigation Measures

MM 4.4.2 Applicants of development projects located within the Mountain Gate at Shasta Area Plan shall submit to the City of Shasta Lake and receive approval for an Emissions Reduction Plan for all subsequent development projects under the Area Plan. City approval will be determined on a project-by-project basis in coordination with the Shasta County Air Quality Management District. The Emissions Reduction Plan shall include all measures recommended by the SCAQMD for the control of fugitive and mobile-source emissions associated with on-site construction activities.

Timing/Implementation: Prior to approval of subsequent tentative subdivision maps or other discretionary approvals

Enforcement/Monitoring: City of Shasta Lake Development Services Department; Shasta County Air Quality Management District

Mitigation measure **MM 4.4.2** would require implementation of SCAQMD-recommended mitigation measures for the control of fugitive and mobile source emissions. The required Emissions Reduction Plan would be prepared in consultation with, and approved by, the SCAQMD prior to construction. Implementation of SCAQMD-recommended mitigation measures would substantially reduce construction-generated emissions. However, as previously stated, although the development of individual areas of the proposed project may not generate short-term emissions in an amount to exceed the SCAQMD Level B significance threshold, it is possible that several areas would be under construction simultaneously and would generate cumulative construction emissions that could surpass this threshold and impact air quality. Since detailed construction schedules are not currently known, it cannot be assured that emissions can be limited to below the significance threshold. While emission offsets may be required, there are no specific emission offset programs at the time of this DEIR. Therefore, this impact would be considered **significant and unavoidable**.

Long-Term Operational Emissions of Air Pollutants Resulting in Violation of Air Quality Standards or Contributing to Existing Violations (Standard of Significance 2)

Impact 4.4.3 Project-generated operational emissions would exceed applicable significance thresholds and could contribute to regional nonattainment conditions. As a result, this impact is considered **potentially significant**.

Buildout of the Area Plan would result in long-term operational emissions of criteria air pollutants and ozone precursors (i.e., ROG and NOx). Project-generated increases in emissions would be predominantly associated with motor vehicle use. To a lesser extent, area sources, such as the use of natural-gas-fired appliances, landscape maintenance equipment, architectural coatings, and hearth fuel combustion, would also contribute to overall increases in emissions.

The Mountain Gate at Shasta Area Plan would include development of approximately 1,604 residential units, approximately 195,584 square feet of nonresidential uses, and approximately 249 acres of park and open space uses.

Long-term operational emissions attributable to the proposed buildout of the Area Plan are summarized in **Table 4.4-8**. At buildout, the Area Plan would result in a maximum net increase of

approximately 2,870.04 pounds per day (lbs/day) of ROG, 257.23 lbs/day of NO_x, 559.34 lbs/day of PM₁₀, and 476.52 lbs/day of PM_{2.5}. It is important to note that these emissions estimates reflect combined emissions from all proposed land uses and do not reflect emissions attributable to individual projects. However, the proposed Area Plan does not include any provisions that require that its growth potential be attained. Not all of the identified land will be available for development at any given time based on site readiness, environmental constraints, market changes, and other factors. This impact discussion assumes full growth potential under the proposed project in order to present the maximum amount of pollutant emissions possible. Project-level analyses of air quality impacts, in accordance with CEQA requirements, would be conducted on a case-by-case basis as future development within the Area Plan proceeds.

TABLE 4.4-8
LONG-TERM OPERATIONAL EMISSIONS

Source	Emissions (lbs/day) ¹			
	ROG	NO _x	PM ₁₀	PM _{2.5}
Area Plan Proposed New Land Uses – Summer Emissions				
Area Source	2,656.58	36.12	441.50	441.49
Energy Use	1.19	10.27	0.82	0.82
Mobile Source ²	196.94	192.98	116.98	34.17
Total	2,854.73	239.38	559.32	476.49
Area Plan Proposed New Land Uses – Winter Emissions				
Area Source	2,656.58	36.12	441.50	441.49
Energy Use	1.19	10.27	0.82	0.82
Mobile Source ²	212.25	210.82	117.01	34.20
Total	2,870.04	257.23	559.34	476.52

Notes: lbs/day=pounds per day; ROG=reactive organic gases; NO_x=oxides of nitrogen; PM₁₀=particulate matter less than or equal to 10 microns in diameter; PM_{2.5}=particulate matter less than or equal to 2.5 microns in diameter

Based on emissions modeling conducted using the CalEEMod computer program. CalEEMod outputs are included as Appendix 4.4-1.

Based on trip generation rates identified in the traffic analysis (Omni-Means 2008) prepared for the project.

As indicated in **Table 4.4-8**, estimated operational emissions of ROG, NO_x, and PM₁₀ associated with buildout of the Area Plan would exceed the SCAQMD's corresponding Level A significance thresholds of 25 pounds per day for ROG and NO_x and 80 pounds per day for PM₁₀. Operational emissions would also exceed the SCAQMD's Level B significance thresholds for ROG, NO_x, and PM₁₀. Because predicted increases in ozone-precursor pollutants (i.e., ROG and NO_x) and PM₁₀ would exceed SCAQMD-recommended significance thresholds, this impact would be considered **potentially significant**.

Mitigation Measures

MM 4.4.3a The installation of wood-burning fireplaces shall be prohibited in all new residential units of subsequent development projects within the Mountain Gate at Shasta Area Plan.

Timing/Implementation: Verified prior to issuance of building permits

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Enforcement/Monitoring: *City of Shasta Lake Development Services Department*

MM 4.4.3b Applicants for subsequent project level development approvals within the Mountain Gate at Shasta Area Plan shall submit to the Shasta County AQMD and receive approval for an Emissions Reduction Plan (ERP). Available Mitigation Measures currently recommended by the Shasta County AQMD are summarized in **Table 4.4-7**.

Timing/Implementation: *Prior to approval of subsequent tentative subdivision maps or other discretionary approvals*

Enforcement/Monitoring: *City of Shasta Lake Development Services Department; Shasta County Air Quality Management District*

Table 4.4-9 reflects the estimated operational emissions associated with buildout of the Area Plan with implementation of mitigation measure **MM 4.4.3a**. While mitigation measure **MM 4.4.3b** would also substantially reduce operational emissions, the emissions reduction value of this mitigation cannot be quantified due to the programmatic nature of the proposed project and the potential variability of future development allowed in the Area Plan. In other words, the specific nature of future project proposals under the Area Plan will influence the specific content and requirements of the future emissions reduction plans mandated by mitigation measure **MM 4.4.3b**.

There are a few specific project features already incorporated into the whole of the proposed Area Plan that would reduce emissions. For instance, as stated in Section 3.0, Project Description, an internal circulation system, in the form of roads and trails, would link all of the uses in the Area Plan. The trails would be located along biologically important areas, such as drainages and wetlands, and would be separated from roadways in some areas of the project site and adjacent to roadways in others. The Area Plan contains a schematic trail plan, a typical trail design section, and policies that require trail linkages for all land uses (see **Figure 3.0-4**). Policies in the Area Plan require that subsequent development connect to and extend any existing trail system. Furthermore, the proposed Area Plan contains a policy provision for transit stops on arterial roadways within the Area Plan. Lastly, the proposed Area Plan contains slightly less than 200,000 square feet of commercial land uses in proximity to residential uses, which will reduce vehicle miles traveled and thus air pollutant emissions. The reductions resulting from this project features are reflected in **Table 4.4-9**.

TABLE 4.4-9
LONG-TERM OPERATIONAL EMISSIONS ACCOUNTING FOR MM 4.4.3a AND EMISSIONS REDUCTION MECHANISMS
INCORPORATED INTO THE PROPOSED AREA PLAN

Source	Emissions (lbs/day) ¹			
	ROG	NO _x	PM ₁₀	PM _{2.5}
Area Plan Proposed New Land Uses – Summer Emissions				
Area Source	112.91	1.57	2.77	2.74
Energy Use	1.19	10.27	0.82	0.82
Mobile Source ²	146.58	149.93	80.25	23.49
Total	260.69	161.78	83.85	27.07
Area Plan Proposed New Land Uses – Winter Emissions				
Area Source	112.91	1.57	2.77	2.74
Energy Use	1.19	10.27	0.82	0.82
Mobile Source ²	155.06	163.10	80.28	23.51
Total	269.17	174.95	83.87	27.09

Notes: lbs/day=pounds per day; ROG=reactive organic gases; NO_x=oxides of nitrogen; PM₁₀=particulate matter less than or equal to 10 microns in diameter; PM_{2.5}=particulate matter less than or equal to 2.5 microns in diameter

1. Based on emissions modeling conducted using the CalEEMod computer program. CalEEMod outputs are included as Appendix 4.4-1.

2. Based on trip generation rates identified in the traffic analysis (Omni-Means 2008) prepared for the project.

As shown in **Table 4.4-9**, accounting for the reduction value of mitigation measure **MM 4.4.3a** and Area Plan features would reduce ROG emissions by approximately 90 percent, NO_x emissions by 32 percent, PM₁₀ emissions by 85 percent, and PM_{2.5} emissions by 94 percent. (As previously mentioned, mitigation measure **MM 4.4.3b** cannot be quantified.) Nonetheless, operational emissions would still exceed the SCAQMD's Level B significance thresholds for ROG and NO_x.

Implementation of mitigation measure **MM 4.4.3a** and **MM 4.4.3b** would reduce long-term operational emissions of ozone-precursor pollutants, but not necessarily to a less than significant level. Emissions offsets may also be required by the SCAQMD in lieu of or in addition to recommended Standard Mitigation Measures or Best Available Mitigation Measures and would be determined on a project-by-project basis (subject to availability) during review of the Emissions Reduction Plan. However, even with implementation of SCAQMD-recommended mitigation measures, given uncertainties concerning the availability of emissions offsets in future years, emissions of criteria air pollutants would still be anticipated to exceed applicable thresholds of significance. As a result, this impact would be considered **significant and unavoidable**.

Exposure of Sensitive Receptors to Near-Term Local Mobile-Source CO Pollutant Concentrations (Standard of Significance 3)

Impact 4.4.4 Implementation of the project would not contribute to localized concentrations of mobile-source CO that would exceed applicable ambient air quality standards. This is considered a **less than significant** impact.

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The primary mobile-source criteria pollutant of local concern is carbon monoxide (CO). Concentrations of CO are a direct function of the number of vehicles, length of delay, and traffic flow conditions. Transport of this criteria pollutant is extremely limited; CO disperses rapidly with distance from the source under normal meteorological conditions. Under certain meteorological conditions, however, CO concentrations close to congested intersections that experience high levels of traffic and elevated background concentrations may reach unhealthy levels, affecting nearby sensitive receptors. Given the high traffic volume potential, areas of high CO concentrations, or “hotspots,” are typically associated with intersections that are projected to operate at unacceptable levels of service during the peak commute hours.¹ Modeling is therefore typically conducted for intersections that are projected to operate at unacceptable levels of service during peak commute hours.

For the purpose of this CO hotspot analysis, the traffic impact analysis (Omni-Means 2008 and 2012) was reviewed in order to identify any project-affected intersection declines in level of service (LOS). If the defined level of service at a project-affected intersection declines from LOS A, B, C, or D to LOS E or F, or if the volume-to-capacity (V/C) ratio increases by 2 percent or more as a result of a proposed project for intersections rated LOS E or worse, the project would pose a potentially significant impact in terms of CO hotspots; specific CO modeling would be required for an accurate significance determination. (The capacity of a transportation system is referred to as the level of service and is generally defined as a ratio of traffic volume to roadway capacity. While it is customary to refer to an LOS using an alphabetic reference A–F, the inevitable comparison to school grades is not accurate. From a purely transportation standpoint, a roadway with an LOS of D is a roadway used to its design capacity.) In other words, the proposed project would result in a less than significant impact to air quality for local CO if:

- Traffic generated by the proposed project would not result in deterioration of intersection level of service to LOS E or F; or
- The project would not contribute additional traffic to an intersection that already operates at LOS of E or F.

Based on the traffic analysis prepared for this project, the proposed project would increase the number of vehicles on the following facilities over existing conditions, causing these facilities to degrade to an unacceptable level of service. Also identified is the traffic scenario (Near-Term Plus Project, Cumulative Year 2020 Plus Project, and Cumulative Year 2030 Plus Project) in which the facility is projected to operate at the most intensive level of unacceptability.

Intersections

- Oasis Road/Interstate 5 (I-5) Southbound Ramps (Near-Term Plus Project)
- State Route (SR) 151/Median Avenue (Cumulative Year 2020 Plus Project)
- SR 151/Mussel Shoals Avenue (Cumulative Year 2020 Plus Project)
- Pine Grove Avenue/I-5 Southbound Ramps (Cumulative Year 2020 Plus Project)
- Pine Grove Avenue/I-5 Northbound Ramps (Cumulative Year 2020 Plus Project)

¹ Level of service (LOS) is a measure used by traffic engineers to determine the effectiveness of transportation infrastructure. LOS is most commonly used to analyze intersections by categorizing traffic flow with corresponding safe driving conditions. LOS A is considered the most efficient level of service and LOS F the least efficient.

- Oasis Road/I-5 Northbound Ramps (Cumulative Year 2020 Plus Project)
- Mountain Gate Road/I-5 Interchange (Cumulative Year 2030 Plus Project)
- SR 273/Lake Boulevard (SR 299) (Cumulative Year 2030 Plus Project)
- Cypress Avenue/I-5 Southbound Ramps (Cumulative Year 2030 Plus Project)
- Cypress Avenue/I-5 Northbound Ramps (Cumulative Year 2030 Plus Project)
- SR 151/Shasta Street (Cumulative Year 2030 Plus Project)
- SR 151/I-5 Southbound Ramps (Cumulative Year 2030 Plus Project)

Freeway Mainline Segments (All Cumulative Year 2030 Plus Project)

- I-5 Northbound, south of Cypress Avenue Interchange
- I-5 Southbound, south of Cypress Avenue Interchange
- I-5 Northbound, north of Cypress Avenue Interchange
- I-5 Northbound, north of SR 44 Interchange
- I-5 Southbound, north of SR 44 Interchange
- I-5 Northbound, north of SR 299 Interchange
- I-5 Southbound, north of SR 299 Interchange
- I-5 Northbound, north of Twin View Boulevard Interchange
- I-5 Southbound, north of Twin View Boulevard Interchange

Freeway Ramps (All Cumulative Year 2030 Plus Project)

- I-5 and SR 151 – SB On-Ramp
- I-5 and Cypress Avenue – NB On-Ramp
- I-5 and SR 44 – NB Loop On-Ramp, SB Direct Off-Ramp, SB Loop Off-Ramp
- I-5 and SR 273 – NB On-Ramp

Since the facilities listed above are projected to operate at an unacceptable level of service with project implementation, CO hotspot modeling was conducted based on PM peak-hour traffic volumes for winter operating conditions. To ensure a conservative analysis, predicted 1-hour and 8-hour CO concentrations were calculated assuming background CO concentrations of 0.1 and 1.8 parts per million (ppm), respectively, based on the most recent available data obtained from the nearest monitoring station that monitors CO, the Chico-Manzanita Avenue CO monitoring site (as previously described, the nearest long-term air quality monitoring station is located at the Shasta Lake-13791 Lake Boulevard Monitoring Station;

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however, this monitoring station does not measure CO and nearest monitoring station that does monitors CO is the Chico-Manzanita Avenue CO monitoring site). A persistence factor of 0.7 was used to convert predicted hourly concentrations to 8-hour concentrations. The predicted 1-hour and 8-hour CO concentrations for future cumulative conditions are summarized in **Table 4.4-10**.

TABLE 4.4-10
PREDICTED LOCAL MOBILE SOURCE CARBON MONOXIDE CONCENTRATIONS
FUTURE CONDITIONS

Traffic Facility	Predicted CO Concentration (ppm)	
	1-hour	8-hour
Intersections		
Oasis Road/I-5 Southbound Ramps	0.6	2.2
SR 151/Median Avenue	0.9	2.4
SR 151/Mussel Shoals Avenue	0.3	2.0
Pine Grove Avenue/I-5 Southbound Ramps	0.2	1.9
Pine Grove Avenue/I-5 Northbound	0.2	1.9
Oasis Road/I-5 Northbound Ramps	0.6	2.2
Mountain Gate Road/I-5 Interchange	0.4	2.1
SR 273/Lake Boulevard (SR 299)	1.9	3.1
Cypress Avenue/I-5 Southbound Ramps	1.4	2.8
Cypress Avenue/I-5 Northbound Ramps	1.5	2.9
SR 151/Shasta Street	0.5	2.2
SR 151/I-5 Southbound Ramps	0.8	2.4
Freeway Mainline Segments		
I-5 Northbound, south of Cypress Avenue Interchange	2.4	3.5
I-5 Southbound, south of Cypress Avenue Interchange	2.1	3.3
I-5 Northbound, north of Cypress Avenue Interchange	2.5	3.6
I-5 Northbound, north of SR 44 Interchange	2.5	3.6
I-5 Southbound, north of SR 44 Interchange	2.2	3.3
I-5 Northbound, north of SR 299 Interchange	2.3	3.4
I-5 Southbound, north of SR 299 Interchange	2.3	3.4
I-5 Northbound, north of Twin View Boulevard Interchange	2.4	3.5
I-5 Southbound, north of Twin View Boulevard Interchange	2.4	3.5
Freeway Ramps		
I-5 and SR 151 – SB On-Ramp	0.3	2.0
I-5 and Cypress Avenue – NB On-Ramp	0.3	2.0
I-5 and SR 44 – NB Loop On-Ramp	0.3	2.0
I-5 and SR 44 – SB Direct Off-Ramp	0.0	0.0

Traffic Facility	Predicted CO Concentration (ppm)	
	1-hour	8-hour
I-5 and SR 44 – SB Loop Off-Ramp	0.0	0.0
I-5 and SR 273 – NB On-Ramp	0.1	1.9
California Ambient Air Quality Standards (CAAQS)	20	9
Predicted Concentrations Exceed CAAQS?	No	No

Note: Predicted CO concentrations are the sums of a background component, which includes the cumulative effects of CO sources in the project area vicinity and the proposed project's contribution. Results based on emissions modeling conducted using the CALINE4 computer program. CALINE4 outputs are included as Appendix 4.4-2.

As noted in **Table 4.4-10**, under future conditions, predicted maximum 1-hour and 8-hour CO concentrations at the intersections projected to operate at unacceptable levels of service during peak commute hours would not exceed even the most stringent corresponding California ambient air quality standards (CAAQS) of 20 and 9 ppm, respectively. Therefore, the proposed project would not contribute to predicted localized concentrations of mobile-source carbon monoxide that would exceed applicable ambient air quality standards. As a result, this impact would be considered **less than significant**.

Mitigation Measures

None required.

Exposure of Sensitive Receptors to Toxic Air Contaminant Pollutant Concentrations (Standard of Significance 3)

Impact 4.4.5 Implementation of the proposed project would not result in increased exposure of existing or planned sensitive land uses to stationary or mobile-source TACs that would exceed applicable standards. As a result, this impact is considered **less than significant**.

Sensitive land uses are generally defined as locations where people reside or where the presence of air emissions could adversely affect the use of the land. Typical sensitive receptors include residents, schoolchildren, hospital patients, and the elderly.

In April 2005, the California Air Resources Board (CARB) released the *Air Quality and Land Use Handbook: A Community Health Perspective*, which offers guidance on siting sensitive land uses in proximity to sources of air toxics. Sensitive land uses identified in the handbook include residential communities, schools and school yards, day-care centers, parks and playgrounds, and hospitals and medical facilities. Particular sources of air toxics treated in the guidance are freeways and major roadways. These roadways are sources of diesel particulate matter (diesel PM), which CARB has listed as a toxic air contaminant.

The handbook recommends that sensitive land uses be sited no closer than 500 feet from a freeway or major roadway, a buffer area that was developed to protect sensitive receptors from exposure to diesel PM, which was based on traffic-related studies that showed a 70 percent drop in particulate matter concentrations at a distance of 500 feet from the roadway. Presumably, acute and chronic risks as well as lifetime cancer risk due to diesel PM exposure are lowered proportionately. The eastern edge of the project site is located adjacent to Interstate 5 (I-5), and the Area Plan proposes up to 129 residential units along this eastern edge (Area M), which is approximately 50 feet from I-5 (see **Figure 3.0-3**). Therefore, sensitive land uses are

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proposed within the CARB-recommended buffer area, and future receptors could be negatively affected by toxic air contaminants generated on I-5.

As a refinement to the CARB handbook, the Sacramento Metropolitan Air Quality Management District (SMAQMD) prepared the *Recommended Protocol for Evaluating the Location of Sensitive Land Uses Adjacent to Major Roadways*, which was updated in March 2011. This protocol sets a screening threshold (276 per million) under which potential health risk impacts are not anticipated. The screening threshold was selected by the SMAQMD as that level of increased individual risk corresponding to a 70 percent reduction from the highest risk calculated at distances from the edge of the nearest travel lane to the nearest sensitive receptor for peak-hour traffic volumes. The use of the SMAQMD's recommended protocol for the purposes of this analysis is considered reasonable and appropriate by Shasta County Air Quality Management District staff (SCAQMD 2012).

Based on the location of the project site (directly adjacent to I-5) and the peak-hour volumes (2,550) along the nearby I-5 segment, the location of the project site would not exceed the thresholds identified in the refined protocol, as shown in **Table 4.4-11**.

TABLE 4.4-11
SCREENING EVALUATION OF POTENTIAL CANCER RISK TO PROPOSED RESIDENCES ATTRIBUTABLE TO I-5

Interstate 5 Peak-Hour Traffic (vehicles/hour)	Receptor Distance from Edge of Nearest Travel Lane (feet)	Incremental Cancer Risk Per Million: West	Distance Screening Threshold (276 per million) Exceeded?	Project Site Distance from Interstate 5	Screening Threshold (276 per million) Surpassed?
2,550	10	219	Not exceeded at any distance	< 50 feet	No
	25	188			
	50	149			
	100	105			
	200	67			
	300	51			
	400	38			
	500	32			

Source: SMAQMD 2011; Peak-Hour Traffic Source: Caltrans 2011

While peak hour volumes along the nearby I-5 segment will most likely experience increases in the future, recent regulations imposed by CARB are anticipated to substantially reduce future diesel PM emissions. CARB's On-Road Heavy-Duty Diesel Vehicles (In Use) Regulation requires diesel trucks and buses that operate in California to be upgraded to reduce emissions. Heavier trucks were required to be retrofitted with particulate matter filters beginning January 1, 2012, and older trucks must be replaced starting January 1, 2015. By January 1, 2023, nearly all trucks and buses will need to have 2010 model year engines or equivalent. The regulation applies to nearly all privately and federally owned diesel-fueled trucks and buses, as well as to privately and publicly owned school buses with a gross vehicle weight rating greater than 14,000 pounds. This regulation ensures that future diesel PM emissions associated with an increase in peak-hour volume of traffic along the nearby I-5 segment will be negligible.

Emissions of toxic air contaminants can result from stationary and/or mobile sources. Emissions of TACs from stationary sources are regulated by the Shasta County Air Quality Management District. As part of the SCAQMD's permitting requirements, major stationary sources having the potential to emit toxic air contaminants would be required to implement measures designed to ensure that potential health risks to nearby existing receptors do not exceed established standards. No major existing stationary sources of TACs that would affect proposed on-site sensitive receptors were identified in the vicinity of the proposed project site (CHAPIS 2012). Exposure of proposed sensitive land uses to existing stationary sources of TACs would therefore be considered **less than significant**.

Mitigation Measures

None required.

4.4.4 CUMULATIVE SETTING, IMPACTS, AND MITIGATION MEASURES

CUMULATIVE SETTING

The cumulative setting for air quality includes the City of Shasta Lake in its entirety and the North Sacramento Valley Air Basin. The Shasta County portion of the NSVAB is designated as a nonattainment area for O₃ and PM₁₀ for state standards. The Shasta County portion of the NSVAB is designated as being unclassified and/or attainment for all pollutants under federal standards. Cumulative growth in population, vehicle use, and industrial activity could inhibit efforts to improve regional air quality and attain the ambient air quality standards.

CUMULATIVE IMPACTS AND MITIGATION MEASURES

Contribution to Net Increase of Air Pollutants for Which the NSVAB Is Nonattainment (Standards of Significance 1, 2, and 6)

Impact 4.4.6 Long-term operation of the project would result in increased emissions of ozone-precursor pollutants and PM₁₀ that would exceed applicable significance thresholds and could contribute to future concentrations of ozone and PM₁₀, for which the region is currently designated nonattainment. This impact would be considered **cumulatively considerable** and **significant and unavoidable**.

Due to the region's nonattainment status for ozone and PM₁₀, if project-generated emissions of either of the ozone-precursor pollutants (i.e., ROG and NO_x) or PM₁₀ would exceed the significance thresholds, the project's cumulative impacts would be considered significant.

As identified under Impact 4.4.2, estimated short-term daily emissions of ROG, NO_x, PM₁₀, and PM_{2.5} associated with the individual project areas of each of the three anticipated phases would exceed the SCAQMD-recommended Level A significance threshold. Also, while the development of individual areas of the proposed project may not generate short-term emissions in an amount to exceed the SCAQMD Level B significance threshold, it is possible that several areas would be under construction simultaneously (detailed construction schedules are not currently known) and would generate cumulative construction emissions that could surpass this threshold and impact air quality. While mitigation measure **MM 4.4.2** would substantially reduce construction-generated emissions, due to the variability of future construction schedules, it cannot be assured that emissions can be limited to less than significant levels.

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As stated under Impact 4.4.3, long-term operational emissions attributable to the proposed buildout of the Area Plan would result in a maximum net increase of approximately 269.17 lbs/day of ROG, 174.95 lbs/day of NO_x, 83.87 lbs/day of PM₁₀, and 27.09 lbs/day of PM_{2.5}. These estimated operational emissions would exceed the SCAQMD's corresponding Level A significance thresholds of 25 pounds per day for ROG and NO_x and 80 pounds per day for PM₁₀. These emissions would also exceed the SCAQMD's Level B significance thresholds for ROG and NO_x. Implementation of mitigation measure **MM 4.4.3a** substantially reduces emissions as shown above. Implementation of mitigation measure **MM 4.4.3b** would also substantially reduce operational emissions of the project, as it includes the requirement of a SCAQMD-approved emissions reduction plan. However, while implementation of mitigation would reduce long-term operational emissions of ozone-precursor pollutants, it cannot be assured to do so to a less than significant level. Emissions offsets could also be available to reduce any remaining operational emissions to below significance thresholds, yet these would be determined on a project-by-project basis (subject to availability) during review of the Emissions Reduction Plan. Also, given uncertainties concerning the availability of emissions offsets in future years, emissions of criteria air pollutants could not be assured to be reduced below applicable thresholds of significance.

As a result, this impact would be considered **cumulatively considerable** and **significant and unavoidable**.

Mitigation Measures

Implement mitigation measures **MM 4.4.1**, **MM 4.4.2**, **MM 4.4.3a**, and **MM 4.4.3b**.

Contribution to Cumulative CO and TAC Concentrations (Standard of Significance 3)

Impact 4.4.7 Implementation of the proposed project, in combination with existing, approved, proposed, and reasonably foreseeable development in the North Sacramento Valley Air Basin, would not contribute to localized concentrations of mobile-source CO or TACs that would exceed applicable ambient air quality standards. This impact would be considered **less than cumulatively considerable**.

The criteria mobile-source air pollutant of primary local concern is carbon monoxide. However, implementation of the proposed project would not be anticipated to contribute to localized concentrations of CO that would exceed applicable ambient air quality standards under future cumulative conditions. In addition, as noted in the discussion for Impact 4.4.5, implementation of the proposed project would not result in the long-term operation of any major stationary sources of TACs.

In terms of major stationary sources of TACs in the vicinity of the proposed project site, there is a proposed quarry and associated asphalt and concrete manufacturing facility development located north of the Area Plan. An air quality assessment has been prepared for this proposed project. Based on current information on how the project might be operated, the assessment provides quantitative air quality impact information for two separate operating scenarios as follows:

- Scenario 1: Initially, the facility is expected to operate such that maximum aggregate production is one million tons per year, mined material is transported to the aggregate processing area by off-road haul trucks, electrical power to the site is provided by a diesel generator, and the access road to the site is unpaved.

- Scenario 2: Within approximately five years, the facility is expected to operate such that maximum aggregate production is two million tons per year, mined material is transported to the aggregate processing area by electric-powered conveyors, electrical power lines are brought to the site, and the access road to the site is paved (Golder 2012).

The Moody Flats Quarry Project Air Quality Impact Analysis (Golder 2012) evaluates the potential impacts of that project, including the estimated air emissions, the resulting ambient air exposure point concentrations to which sensitive human receptors could be exposed, and potential associated human health effects. The analysis specifically evaluates the maximum predicted cancer and non-cancer health effects of the Moody Flats Quarry project to the potential development proposed under the Area Plan (referred to as the “Hypothetical Development” in the air quality assessment). According to the report (Golder 2012), quarry-related impacts to the potential development proposed under the Area Plan associated with lifetime excess cancer risks, chronic non-cancer hazards, and acute non-cancer hazard were all below significance thresholds and therefore less than significant. In other words, the proposed Moody Flats Quarry project would have no negative effect on future residents of the proposed Area Plan. As a result, impacts from cumulative concentrations of air pollutants would be considered **less than cumulatively considerable**.

Mitigation Measures

None required.

4.4 AIR QUALITY

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4.5 NOISE

This section discusses the existing noise setting, identifies potential impacts, and proposes mitigation measures related to noise for the Mountain Gate at Shasta Area Plan. The basis of this analysis was performed by Kurt Legleiter of Ambient Air Quality & Noise Consulting Inc. and is included as **Appendix 4.5-1**.

4.5.1 EXISTING SETTING

NOISE BACKGROUND

Acoustic Fundamentals

Noise is generally defined as sound that is loud, disagreeable, or unexpected. Sound, as described in more detail below, is mechanical energy transmitted in the form of a wave because of a disturbance or vibration.

Amplitude

Amplitude is the difference between ambient air pressure and the peak pressure of the sound wave. Amplitude is measured in decibels (dB) on a logarithmic scale. For example, a 65 dB source of sound, such as a truck, when joined by another 65 dB source results in a sound amplitude of 68 dB, not 130 dB (i.e., doubling the source strength increases the sound pressure by 3 dB). Amplitude is interpreted by the ear as corresponding to different degrees of loudness. Laboratory measurements correlate a 10 dB increase in amplitude with a perceived doubling of loudness and establish a 3 dB change in amplitude as the minimum audible difference perceptible to the average person (EPA 1971).

Frequency

Frequency is the number of fluctuations of the pressure wave per second. The unit of frequency is the Hertz (Hz). One Hz equals one cycle per second. The human ear is not equally sensitive to sound of different frequencies. Sound waves below 16 Hz or above 20,000 Hz cannot be heard at all, and the ear is more sensitive to sound in the higher portion of this range than in the lower. To approximate this sensitivity, environmental sound is usually measured in A-weighted decibels (dBA). On this scale, the normal range of human hearing extends from about 10 dBA to about 140 dBA (EPA 1971).

Characteristics of Sound Propagation and Attenuation

Noise can be generated by a number of sources, including mobile sources, such as automobiles, trucks, and airplanes, and stationary sources, such as construction sites, machinery, and industrial operations. Noise generated by mobile sources typically attenuates at a rate between 3.0 and 4.5 dBA per doubling of distance. The rate depends on the ground surface and the number or type of objects between the noise source and the receiver. Mobile transportation sources, such as highways, and hard and flat surfaces, such as concrete or asphalt, have an attenuation rate of 3.0 dBA per doubling of distance. Soft surfaces, such as uneven or vegetated terrain, have an attenuation rate of about 4.5 dBA per doubling of distance from the source. Noise generated by stationary sources typically attenuates at a rate of approximately 6.0 to 7.5 dBA per doubling of distance from the source (EPA 1971).

Sound levels can be reduced by placing barriers between the noise source and the receiver. In general, barriers contribute to decreasing noise levels only when the structure breaks the “line of sight” between the source and the receiver. Buildings, concrete walls, and berms can all act as

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effective noise barriers. Wooden fences or broad areas of dense foliage can also reduce noise, but are less effective than solid barriers.

Noise Descriptors

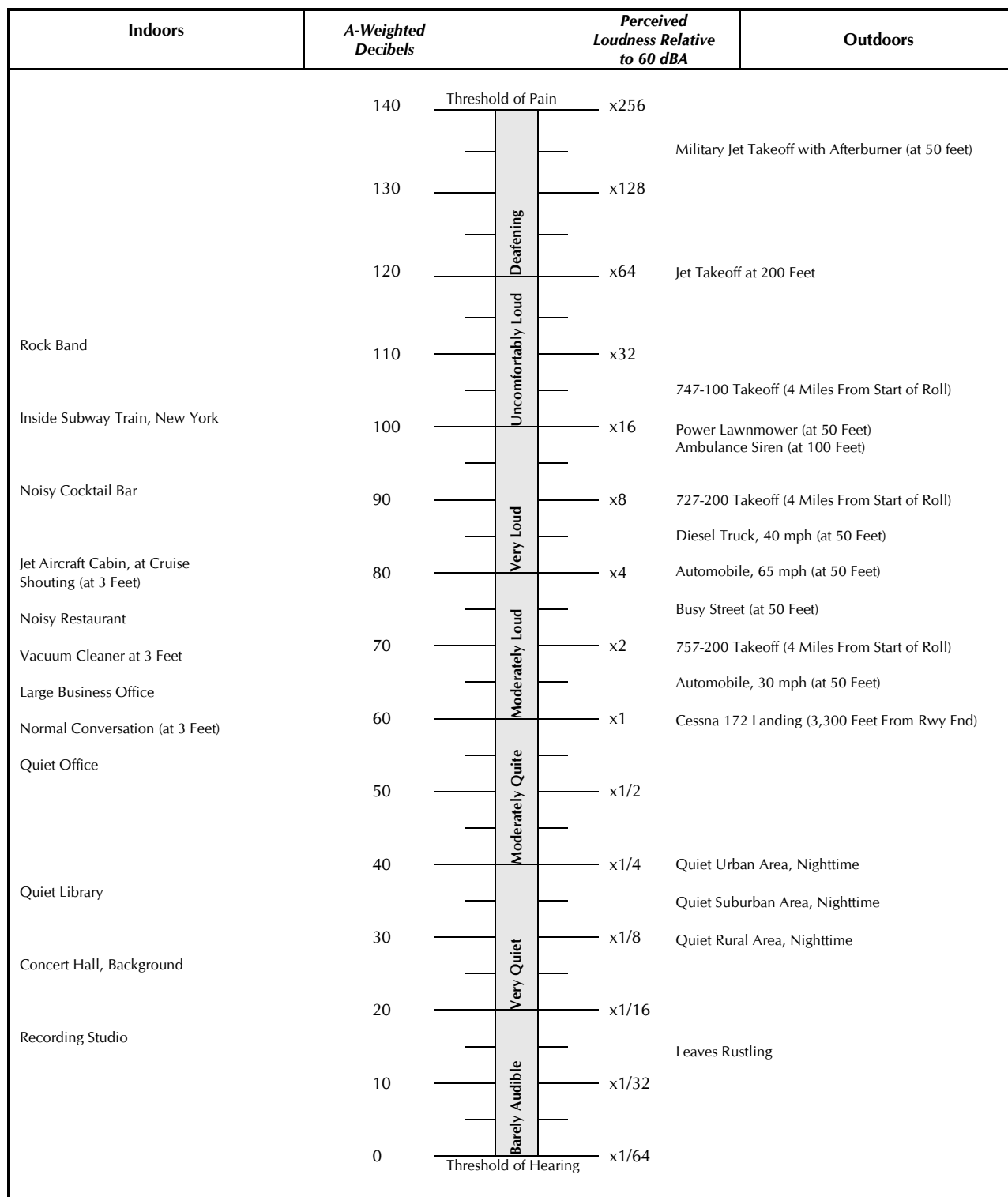
The selection of a proper noise descriptor for a specific source is dependent on the spatial and temporal distribution, duration, and fluctuation of the noise. The noise descriptors most often encountered when dealing with traffic, community, and environmental noise are defined below (Lipscomb and Taylor 1978).

- Maximum Noise Level (L_{max}): The maximum instantaneous noise level during a specific period of time.
- Minimum Noise Level (L_{min}): The minimum instantaneous noise level during a specific period of time.
- Energy Equivalent Noise Level (L_{eq}): The energy mean (average) noise level. The instantaneous noise levels during a specific period of time in dBA are converted to relative energy values. From the sum of the relative energy values, an average energy value (in dBA) is calculated.
- Day-Night Noise Level (L_{dn}): The 24-hour L_{eq} with a 10 dBA “penalty” for noise events that occur during the noise-sensitive hours between 10:00 PM and 7:00 AM. In other words, 10 dBA is “added” to noise events that occur in the nighttime hours to account for increases sensitivity to noise during these hours.
- Community Noise Equivalent Level (CNEL): The CNEL is similar to the L_{dn} described above, but with an additional 5 dBA “penalty” added to noise events that occur between the hours of 7:00 PM to 10:00 PM. The calculated CNEL is typically approximately 0.5 dBA higher than the calculated L_{dn} .

Human Response to Noise

The human response to environmental noise is subjective and varies considerably from individual to individual. Noise in the community has often been cited as a health problem, not in terms of actual physiological damage, such as hearing impairment, but in terms of inhibiting general well-being and contributing to undue stress and annoyance. The health effects of noise in the community arise from interference with human activities, including sleep, speech, recreation, and tasks that demand concentration or coordination. Hearing loss can occur at the highest noise intensity levels. When community noise interferes with human activities or contributes to stress, public annoyance with the noise source increases. The acceptability of noise and the threat to public well-being are the basis for land use planning policies preventing exposure to excessive community noise levels. Typical community noise levels are depicted in **Figure 4.5-1**.

**FIGURE 4.5-1
TYPICAL COMMUNITY NOISE LEVELS**



4.5 NOISE

Unfortunately, there is no completely satisfactory way to measure the subjective effects of noise or the corresponding reactions of annoyance and dissatisfaction. This is primarily because of the wide variation in individual thresholds of annoyance and habituation to noise over differing individual experiences with noise. Thus, an important way of determining a person's subjective reaction to a new noise is the comparison of it to the existing environment to which one has adapted: the so-called "ambient" environment. In general, the more a new noise exceeds the previously existing ambient noise level, the less acceptable the new noise will be judged. Regarding increases in A-weighted noise levels, knowledge of the following relationships will be helpful in understanding this analysis:

- Except in carefully controlled laboratory experiments, a change of 1 dB cannot be perceived by humans.
- Outside of the laboratory, a 3 dB change is considered a just-perceivable difference.
- A change in level of at least 5 dB is required before any noticeable change in community response would be expected. An increase of 5 dB is typically considered substantial.
- A 10 dB change is subjectively heard as an approximate doubling in loudness and would almost certainly cause an adverse change in community response.

When evaluating noise impacts, based on the above relationships, it is generally recognized that an increase of greater than 3 dBA is considered potentially significant. However, increases in ambient noise levels need to also take into account the existing noise environment. Consequently, increases in cumulative noise exposure (in CNEL/ L_{dn}) of 5 dBA are generally considered significant in areas where the ambient noise environment is less than 60 dBA. In areas where the ambient noise environment is between 60 and 65 dBA, increases of 3.0 dBA, or greater, would be considered significant. In areas where the ambient noise environment exceeds 65 dBA, a predicted increase of 1.5 dBA, or greater, would be considered significant. These thresholds were initially recommended by the Federal Interagency Committee on Noise (FICON) in 1972, based on noise levels at which people typically become increasingly annoyed. These recommendations have since been recognized by various local, state, and federal agencies and are the criteria typically used for the analysis of increases in ambient noise levels (FAA 2000).

EXISTING NOISE-SENSITIVE LAND USES

Noise-sensitive land uses are generally considered to include those uses that would result in noise exposure which could result in health-related risks to individuals, as well as places where quiet is an essential element of their intended purpose. Residential dwellings, including senior housing, are of primary concern because of the potential for increased and prolonged exposure of individuals to both interior and exterior noise levels. Additional land uses such as parks, historic sites, cemeteries, and recreation areas are also considered sensitive to increases in exterior noise levels. Schools, churches, hotels, libraries, and other places where low interior noise levels are essential are also considered noise-sensitive land uses. Existing noise-sensitive receptors in the vicinity of the project site consist primarily of residential land uses located along the western and southern boundaries of the proposed project site, and Grand Oaks Elementary School to the south.

AMBIENT NOISE SURVEY

To document the existing noise environment, ambient noise surveys were conducted by Ambient Air Quality & Noise Consulting at various locations in the project area. Short-term (10-minute) noise level measurements were conducted using a Larson Davis model 820 sound-level meter placed at a height of approximately 4.5 feet above the ground surface. Based on the measurements conducted, average daytime noise levels (in dBA L_{eq}) in the project area generally range from the lower 40s to upper 60s, dependent primarily on distance from nearby roadways. Measurement locations and corresponding maximum measured daytime noise levels are summarized in **Table 4.5-1** and depicted in **Figure 4.5-2**.

TABLE 4.5-1
AMBIENT DAYTIME NOISE LEVELS

	Location	Time	Primary Noise Sources Noted	Measured Noise Level (dBA)		
				L_{eq}	L_{min}	L_{max}
1	Wonderland Boulevard, 100 feet from Interstate 5	8:15 AM–8:25 AM	Vehicle traffic on I-5	67.2	52.9	72.3
2	Buena Vista Street and Grand Avenue	9:50 AM–9:00 AM	Vehicle traffic on area roadways, children's voices	59.4	44.8	55.3
3	Koch Street and Eugene Street	9:20 AM–9:30 AM	Vehicle traffic on area roadways	44.1	39.1	48.3

Source: Ambient 2007

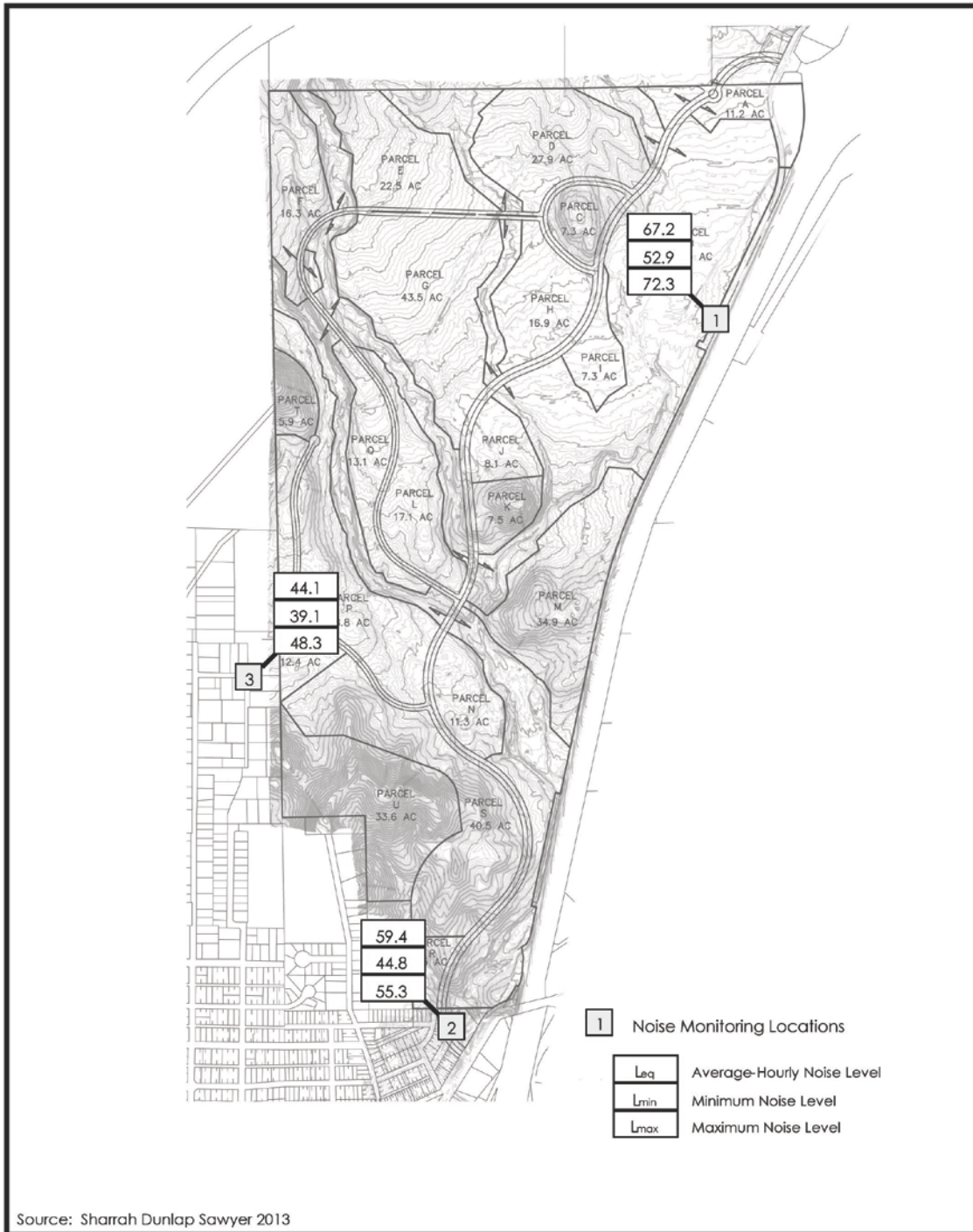
Notes: Noise measurement conducted using a Larson Davis model 820 Type I sound-level meter on January 3, 2007. Measurement locations correspond to those depicted in Figure 4.5-2.

Ambient noise levels in the Area Plan are influenced primarily by vehicle traffic on area roadways, primarily Interstate 5 (I-5), as well as by trains traveling along the Union Pacific Railroad (UPRR) rail line. Noise levels associated with these sources are discussed in more detail below.

Roadway Traffic Noise

Table 4.5-2 summarizes the existing traffic noise levels (in dBA CNEL) at 50 feet from the near travel lane centerline for existing traffic conditions. Existing roadway traffic noise levels were calculated for these roadway segments using the Federal Highway Administration (FHWA) traffic noise prediction model. Traffic data used in the analysis was obtained from the traffic analysis prepared for this project. Additional input data included day/night percentages of autos, medium trucks, and heavy trucks, vehicle speeds, ground attenuation factors, and roadway widths. Based on the modeling conducted, traffic noise levels along area roadways generally range from the low 50s to the low 60s at 50 feet from the centerline of the near travel lane. Ambient noise levels measured at approximately 100 feet from I-5 measured 67.2 dBA L_{eq} . For major roadways such as I-5, the measured peak-hour noise level is typically representative of average-daily noise levels.

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Not to scale



Figure 4.5-2
Mountain Gate at Shasta, Ambient Noise Environment

PMC

TABLE 4.5-2
SUMMARY OF EXISTING TRAFFIC NOISE LEVELS

Roadway Segment and Location	L_{dn}/CNEL (dBA) 50 Feet from Near Travel Lane Centerline
Shasta Dam Boulevard, North Boulevard to Ashby Road	62.5
Ashby Road, Fort Peck Street to Flower Street	60.2
Montana Avenue, Main Street to Front Street	55.6
Red Bluff Street, Washington Avenue to Grand River Avenue	50.1
Main Street, Washington Avenue to Grand River Avenue	51.3
Mussel Shoals Avenue, Front Street to Shasta Dam Boulevard	56.7
Grand Coulee Boulevard, Fort Peck Street to Shasta Dam Boulevard	56.9
Pine Grove Avenue, Lake Boulevard to Ashby Road	61.7
Cascade Boulevard, Pine Grove Avenue to Deer Creek Avenue	61.3
Pine Grove Avenue, Smith Avenue to Cascade Boulevard	61.6

Source: Ambient 2007

Notes: Traffic noise levels were predicted using the FHWA traffic noise prediction model based on data obtained from the traffic analysis prepared for this project. Predicted noise levels do not take into account shielding provided by intervening structures or noise barriers.

Union Pacific Railroad

The UPRR rail line extends along the western and northern boundaries of the Area Plan in a general north-south direction. Based on conversations with Union Pacific officials, an average of approximately 25 freight trains travel along this track on a daily basis. The number of freight trains traveling along this segment can vary from day to day, depending on demand, and there are currently no hourly limitations during which freight train travel is limited. The UPRR does not anticipate substantial changes in freight train traffic in future years. This track is also used by Amtrak for its Coast Starlight train run. Amtrak's use of the tracks currently consists of two trains, which typically travel between the early morning hours of 2:15 and 3:15 AM (Ambient 2007).

The Federal Transit Administration's (FTA) (2006) *Transit Noise and Vibration Impact Assessment* guidelines were used for the calculation of wayside noise levels generated by the trains traveling along the UPRR corridor. Wayside noise levels were calculated based, in part, on average train speeds, train length, and the number of trains traveling during the daytime and nighttime hours. For modeling purposes, freight train travel along the UPRR corridor was assumed to total 25 trains per day equally dispersed throughout the daytime and nighttime hours. Amtrak trains running during the early morning hours were also included in the calculation. Predicted wayside noise levels at 50 feet from the track centerline and the projected distance to the 60, 65, and 70 dBA CNEL noise contours for the UPRR are summarized in **Table 4.5-3**. Based on the modeling conducted, the projected wayside noise levels along the UPRR corridor are estimated at approximately 78 dBA CNEL at 50 feet from the track centerline. The projected 60 dBA CNEL noise contour for the UPRR corridor would extend to a distance of approximately 855 feet from the track centerline. The projected 65 and 70 dBA CNEL noise contours for the UPRR corridor would extend to distances of approximately 400 and 185 feet from the track centerline, respectively.

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**TABLE 4.5-3
EXISTING UPRR NOISE LEVELS**

Railway	Wayside Noise Levels (dBA CNEL) at 50 Feet from Track Centerline	Distance from Track Centerline to Predicted Noise Contour (dBA CNEL)		
		60	65	70
Union Pacific Railroad	78	855	400	185

Source: Ambient 2007

Notes: Wayside noise levels take into account freight and passenger trains.

4.5.2 REGULATORY FRAMEWORK

STATE

The State of California regulates vehicular and freeway noise affecting classrooms, sets standards for sound transmission and occupational noise control, and identifies noise insulation standards and airport noise/land-use compatibility criteria. The *State of California General Plan Guidelines*, published by the Governor's Office of Planning and Research (OPR) in 2003, provide guidance for the acceptability of projects within specific CNEL contours. The guidelines also present adjustment factors that may be used in order to arrive at noise acceptability standards that reflect the noise control goals of the community, the particular community's sensitivity to noise, and the community's assessment of the relative importance of noise pollution. **Table 4.5-4** summarizes the acceptable and unacceptable community noise exposure limits for various land use categories, as currently defined by the State of California.

Title 24 of the California Code of Regulations establishes standards governing interior noise levels that apply to all new multi-family residential units (hotels, motels, apartments, condominiums, and other attached dwellings) in California. These standards require that acoustical studies be performed prior to construction at residential building locations where the existing exterior L_{dn} exceeds 60 dBA. Such acoustical studies are required to establish mitigation measures that will limit maximum L_{dn} noise levels to 45 dBA in any habitable room.

**TABLE 4.5-4
STATE OF CALIFORNIA
LAND USE COMPATIBILITY FOR COMMUNITY NOISE ENVIRONMENTS**

Land Use	Noise Levels (dBA CNEL/ L_{dn})			
	Normally Acceptable	Conditionally Acceptable	Normally Unacceptable	Clearly Unacceptable
Residential Uses – Low-Density Single-Family, Duplex, Mobile Home	< 60	55 to 70	70 to 75	> 75
Residential – Multi-Family	< 65	60 to 70	70 to 75	> 75
Transient Lodging, Hotel, Motel	< 65	60 to 70	70 to 80	> 80
School, Library, Church, Hospital, Nursing Home	< 70	60 to 70	70 to 80	> 80
Auditorium, Concert Hall, Amphitheater		< 70		> 65
Sports Arena, Outdoor Spectator Sports		< 75		> 70
Playground, Neighborhood Park	< 80		67.5 to 75	> 72.5

Land Use	Noise Levels (dBA CNEL/L _{dn})			
	Normally Acceptable	Conditionally Acceptable	Normally Unacceptable	Clearly Unacceptable
Golf Course, Riding Stables, Water Recreation, Cemetery	< 75		70 to 80	> 80
Office Building, Business, Commercial, Professional	< 70	67.5 to 77.5	> 75	
Industrial, Manufacturing, Utilities, Agricultural	< 75	70 to 80	> 75	

Source: OPR 2003

Notes:

Normally Acceptable: Specified land use is satisfactory, based on the assumption that any buildings involved are of normal conventional construction, without any special noise insulation requirements.

Conditionally Acceptable: New construction or development should be undertaken only after a detailed analysis of the noise reduction requirements is made and needed noise insulation features included in the design. Conventional construction, but with closed windows and fresh air supply systems or air conditioning will normally suffice.

Normally Unacceptable: New construction or development should generally be discouraged. If new construction or development does proceed, a detailed analysis of the noise reduction requirements must be made and needed noise insulation features included in the design.

Clearly Unacceptable: New construction or development should generally not be undertaken.

LOCAL

City of Shasta Lake General Plan

The City of Shasta Lake General Plan contains goals and policies to protect citizens from exposure to excessive noise. The General Plan establishes standards for various land use categories. The standards provide the basis for decisions on determining the compatibility of proposed new land uses and appropriate noise mitigation requirements. The City's noise standards are summarized in **Table 4.5-5**.

TABLE 4.5-5
CITY OF SHASTA LAKE NOISE SENSITIVITY STANDARDS

New Land Use	Outdoor Activity Area (dBA L _{dn})	Interior Activity Area (dBA L _{dn} /Peak Hour L _{eq}) ¹	Notes (see below)
All Residential	60–65	45	2,3,4
Transient Lodging	65	45	5
Hospitals & Nursing Homes	60	45	6
Theaters & Auditoriums	–	35	
Churches, Meeting Halls, Schools, Libraries, etc.	60	40	
Office Buildings	65	45	7
Commercial Buildings	65	50	7
Playgrounds, Parks, etc.	70	–	
Industrial Facilities	65	50	7

Source: City of Shasta Lake 1999, Noise Element Table N-1

Notes:

1. For traffic noise within the City of Shasta Lake, L_{dn} and peak-hour L_{eq} values are estimated to be approximately similar. Interior noise level standards are applied within noise-sensitive areas of the various land uses, with windows and doors in the closed positions.

2. Outdoor activity areas for single-family residential uses are defined as backyards. For large parcels or residences with no clearly defined outdoor activity area, the standard shall be applicable within a 100-foot radius of the residence.

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3. For multi-family residential uses, the exterior noise level standard shall be applied at the common outdoor recreation area, such as at pools, play areas, or tennis courts. Where such areas are not provided, the standards shall be applied at individual patios and balconies of the development.

4. Where it is not possible to reduce noise in outdoor activity areas to 60 dB Ldn or less using a practical application of the best-available noise reduction measures, an exterior noise level of up to 65 dB Ldn may be allowed provided that available exterior noise level reduction measures have been implemented and interior noise levels are in compliance with this table.

5. Outdoor activity areas of transient lodging facilities include swimming pool and picnic areas.

6. Hospitals are often noise-generating uses. The exterior noise level standards for hospitals are applicable only at clearly identified areas designated for outdoor relaxation by either hospital staff or patients.

7. Only the exterior spaces of these uses designated for employee or customer relaxation have any degree of sensitivity to noise.

General Plan objectives and policies applicable to the proposed project are summarized in **Table 4.5-6**. While this Draft EIR analyzes the project's consistency with the General Plan pursuant to California Environmental Quality Act (CEQA) Section 15125(d), it is the City of Shasta Lake Planning Commission and/or City Council that will make the determination of the project's consistency with the identified General Plan policies.

**TABLE 4.5-6
PROJECT CONSISTENCY WITH CITY OF SHASTA LAKE
GENERAL PLAN: NOISE**

General Plan Objectives & Policies	Consistent with General Plan?	Analysis
Noise Objectives		Based on the analysis, noise-sensitive land uses may be exposed to increases in ambient noise levels that could exceed the City's noise standards. Mitigation is incorporated to require preparation of acoustical analyses prior to approval of on-site development to ensure that adequate noise mitigation will be incorporated, as development occurs, to protect nearby noise-sensitive land uses and to ensure that proposed land uses are not developed in incompatible noise environments.
N-1 Protect noise sensitive areas of the City by regulation of new noise-generating development.	Yes, with mitigation	
N-2 Protect noise sensitive new development from existing and future noise generators by regulations encouraging each to locate within compatible noise environments.	Yes, with mitigation	
N-3 Protect established noise-generating development from noise sensitive new development.	Yes, with mitigation	
Noise Policies		
N-a New development shall use appropriate site planning and building design to reduce undesirable noise impacts. The noise sensitivity of land uses as established in Table N-1 (Table 4.5-1) shall be used in the location of new development, preparation of general plan amendments and specific plans. The noise exposure level shall be established by reference to the Noise Contour Map (on file with the City) or project-specific measurements or calculations. The interpretive guidelines in Figure N-1 shall not be applied mechanically, but with the degree of flexibility required in each case to achieve a sound and feasible land use decision. However, in no case shall a residential land use be located where the existing noise environment, combined with the measured or calculated noise reduction of the type of structure under consideration, makes it impossible to maintain an interior noise environment at or below 45 dBA CNEL.	Yes, with mitigation	

General Plan Objectives & Policies	Consistent with General Plan?	Analysis
N-b The planning and design of improvements in the circulation systems shall consider their noise impacts on adjacent land uses and shall include measures to mitigate significant noise impacts.	Yes, with mitigation	

4.5.3 IMPACTS AND MITIGATION MEASURES

STANDARDS OF SIGNIFICANCE

Based on Appendix G of the CEQA Guidelines, the City concludes that the project may have significant impacts related to noise if it results in any of the following:

- 1) Exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies.
- 2) A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project.
- 3) A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project.
- 4) Exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels.
- 5) For a project located within an airport land use plan or, where such a plan has not been adopted, within 2 miles of a public airport or public use airport, exposure of people residing or working in the project area to excessive noise levels.
- 6) For a project in the vicinity of a private airstrip, exposure of people residing or working in the project area to excessive noise levels.

As determined in the Initial Study prepared for the proposed project, the Area Plan is not located within 2 miles of a public airport or a public use airport, and there are no private airstrips in the vicinity of the project site. Therefore, these impacts (Standards of Significance 5 and 6) will not be addressed further in this Draft EIR.

For purposes of this analysis, increases in ambient noise levels of 5 dBA would be considered significant in areas where the ambient noise environment is less than 60 dBA. In areas where the ambient noise environment is between 60 and 65 dBA, increases of 3.0 dBA, or greater, would be considered significant. In areas where the ambient noise environment exceeds 65 dBA, a predicted increase of 1.5 dBA, or greater, would be considered significant.

METHODOLOGY

A combination of existing literature, noise level measurements, and application of accepted noise prediction and sound propagation algorithms was used to predict changes in ambient noise levels resulting from development within the project area. Specific noise sources evaluated in this section include traffic and future noise sources that will be developed within the project area. Noise impacts of each of these major noise sources are described below.

4.5 NOISE

IMPACTS AND MITIGATION MEASURES

Exposure of Persons to or Generation of Temporary or Periodic Construction Noise in Excess of Established Standards (Standards of Significance 1 and 2)

Impact 4.5.1 Short-term construction-generated noise levels could result in a substantial increase in ambient noise levels at nearby noise-sensitive land uses, including proposed residential uses that are constructed and inhabited before other portions of the project are complete. As a result, noise-generating construction activities would be considered to have a **potentially significant** short-term impact.

The proposed tentative subdivision map would result in the construction of roadways on-site, partial site grading, and the installation of utilities to support future development. The noise from this construction, as well as the construction noise of subsequent development allowed under the proposed Area Plan in any one particular area, would be temporary and would include noise from activities such as excavation, site preparation, truck hauling of material, pouring of concrete, and use of power hand tools. Construction noise typically occurs intermittently and varies depending on the nature of the construction activities being performed. Noise generated by construction equipment, including excavation equipment, material handlers, and portable generators, can reach high levels for brief periods. There are sensitive receptors to the west and south of the proposed project that could be affected by construction activities associated with the project. Specifically, existing residences and Grand Oaks Elementary School are near areas that will have construction activity.

When noise levels generated by construction operations are being evaluated, activities occurring during the more noise-sensitive evening and nighttime hours are of increased concern. Because exterior ambient noise levels typically decrease during the late evening and nighttime hours as community activities (e.g., industrial activities, vehicle traffic) decrease, construction activities performed during these more noise-sensitive periods of the day can result in increased annoyance and potential sleep disruption for occupants of nearby residential dwellings.

The US Environmental Protection Agency (EPA) has found that the average noise levels associated with construction activities typically range from approximately 76 dBA to 84 dBA L_{eq} , with intermittent individual equipment noise levels ranging from approximately 75 dBA to more than 88 dBA for brief periods. **Table 4.5-7** lists typical uncontrolled noise levels generated by individual pieces of construction equipment at a distance of 50 feet.

TABLE 4.5-7
TYPICAL CONSTRUCTION EQUIPMENT NOISE LEVELS

Equipment	Typical Noise Level (dBA L_{max}) 50 Feet from Source
Backhoe	80
Compactor	82
Dozer	85
Grader	85
Loader	85

Equipment	Typical Noise Level (dBA Lmax) 50 Feet from Source
Truck	88
Air Compressor	81
Concrete Mixer	85
Concrete Pump	82
Concrete Vibrator	76
Crane, Mobile	83
Generator	81
Impact Wrench	85
Jackhammer	88
Paver	89
Pneumatic Tool	85
Pump	76
Roller	74
Saw	76

Source: Ambient 2007

Noise from localized point sources (such as construction sites) typically decreases by approximately 6 dBA with each doubling of distance from source to receptor. Given this noise attenuation rate and assuming no noise shielding from either natural or human-made features (e.g., trees, buildings, fences), outdoor receptors within approximately 1,600 feet of construction sites could experience maximum instantaneous noise levels of greater than 60 dBA when on-site construction-related noise levels exceed approximately 90 dBA at the boundary of the construction site. As previously discussed, nearby noise-sensitive receptors consist predominantly of residential dwellings and an elementary school located near the southern boundary of the Area Plan.

During development of the proposed project, construction activities occurring during the more noise-sensitive late evening and nighttime hours (i.e., 7 PM to 7 AM) could result in increased levels of annoyance and potential sleep disruption for occupants of nearby existing noise-sensitive land uses. Given that the Area Plan would likely be developed in multiple phases over a period of years, there is also the potential for construction activities to occur in close proximity to proposed on-site residential land uses. As a result, noise-generating construction activities would be considered to have a **potentially significant** short-term impact.

Mitigation Measure

MM 4.5.1

The City shall establish the following as conditions of approval for any permit that results in the use of construction equipment:

- Construction activities (excluding activities that would result in a safety concern to the public or construction workers) shall be limited to between the daytime hours of 7 AM and 7 PM, Monday through Saturday. Construction activities shall be prohibited on Sundays and federal/state-recognized holidays.

4.5 NOISE

- Construction equipment shall be properly maintained and equipped with noise-reduction intake and exhaust mufflers and engine shrouds, in accordance with manufacturers' recommendations. Equipment engine shrouds shall be closed during equipment operation.
- When not in use, motorized construction equipment shall not be left idling for more than 5 minutes.
- Stationary equipment (power generators, compressors, etc.) shall be located at the furthest practical distance from nearby noise-sensitive land uses or sufficiently shielded to reduce noise-related impacts.

Timing/Implementation: Implemented prior to approval of grading and/or building permits

Enforcement/Monitoring: City of Shasta Lake Development Services Department

Implementation of mitigation measure **MM 4.5.1** would reduce construction-generated noise levels by approximately 10 dBA (Ambient 2007). With mitigation, this impact would be considered **less than significant**.

Exposure of Persons to or Generation of Substantial Permanent Operational Traffic Noise in Excess of Established Standards (Standards of Significance 1 and 3)

Impact 4.5.2 Implementation of the proposed project would not result in substantial increases in near-term traffic noise levels along area roadways. This would be a **less than significant** impact.

Implementation of the proposed land uses would result in increased traffic volumes on some area roadways. The increase in traffic volumes resulting from implementation of the proposed project would therefore contribute to predicted increases in traffic noise levels. The FHWA roadway noise prediction model was used to predict traffic noise levels along affected roadways for existing traffic conditions, with and without implementation of the proposed project.

Modeling was conducted for roadways anticipated to be primarily affected by the proposed project, based on predicted traffic volumes obtained from the traffic analysis prepared for the project. The proposed project's contribution to traffic noise levels along area roadways was determined by comparing the predicted noise levels with and without project-generated traffic under existing conditions. Predicted traffic noise levels are summarized in **Table 4.5-8**.

**TABLE 4.5-8
PREDICTED INCREASES IN TRAFFIC NOISE LEVELS
NEAR-TERM CONDITIONS (YEAR 2010)**

Roadway Segment	CNEL (dBA) at 50 Feet from Near Travel Lane Centerline			
	Without Project	With Project	Predicted Increase	Significant?*
Shasta Dam Boulevard, North Boulevard to Ashby Road	62.67	62.69	0.02	No
Ashby Road, Fort Peck Street to Flower Street	60.51	60.65	0.14	No
Montana Avenue, Main Street to Front Street	55.69	56.01	0.32	No
Red Bluff Street, Washington Avenue to Grand River Avenue	50.21	50.73	0.52	No
Main Street, Washington Avenue to Grand River Avenue	51.52	52.05	0.53	No
Mussel Shoals Avenue, Front Street to Shasta Dam Boulevard	57.04	57.81	0.77	No
Grand Coulee Boulevard, Fort Peck Street to Shasta Dam Boulevard	59.68	59.71	0.03	No
Pine Grove Avenue, Lake Boulevard to Ashby Road	62.90	62.93	0.03	No
Cascade Boulevard, Pine Grove Avenue to Deer Creek Avenue	61.54	61.72	0.18	No
Pine Grove Avenue, Smith Avenue to Cascade Boulevard	63.01	63.04	0.03	No

Source: Ambient 2007

Notes: Traffic noise levels were predicted using the FHWA Traffic Noise Model based on data obtained from the traffic analysis prepared for this project. Predicted noise levels do not take into account shielding provided by intervening structures or existing noise barriers.

* For purposes of this analysis, increases in ambient noise levels of 5 dBA would be considered significant in areas where the ambient noise environment is less than 60 dBA. In areas where the ambient noise environment is between 60 and 65 dBA, increases of 3.0 dBA, or greater, would be considered significant. In areas where the ambient noise environment exceeds 65 dBA, a predicted increase of 1.5 dBA, or greater, would be considered significant.

4.5 NOISE

As depicted in **Table 4.5-8**, implementation of the proposed project would result in predicted increases in traffic noise levels along primary affected roadways of less than 1 dBA. Because implementation of the proposed project would not result in a substantial increase in traffic noise levels, this impact would be considered **less than significant**.

Mitigation Measures

None required.

Exposure of Persons to or Generation of Substantial Permanent Operational Stationary-Source Noise in Excess of Established Standards (Standards of Significance 1 and 3)

Impact 4.5.3 Exposure to noise levels generated by future stationary sources associated with the proposed commercial land uses could result in a substantial increase in ambient noise levels that could exceed the City's noise standards at noise-sensitive land uses. This impact would be **potentially significant**.

No major existing stationary noise sources were identified in the project area that would adversely affect proposed on-site land uses. The proposed project, however, includes a mix of various land uses, including residential, neighborhood park, and commercial land uses. These land uses would result in new stationary noise sources that could potentially exceed applicable noise standards at nearby noise-sensitive land uses. Noise levels typically associated with these land uses and associated noise impacts are discussed separately below.

Residential

Noise from proposed residential dwellings would expose other nearby residences (both existing and proposed) to minor intermittent increases in ambient noise levels. Noise typically associated with such development includes lawn and garden equipment, voices, and amplified music. Noise generated from these activities would be intermittent and would primarily occur during the daytime and evening hours and less frequently at night. With the exception of exterior central air conditioning (AC) units, residential dwellings are typically not considered a major stationary source of noise. Within higher-density development, AC units can result in increased noise levels within interior building areas that can result in increased levels of annoyance and potential sleep disruption, particularly when building windows are open. Noise generated by residential central air conditioning units typically average approximately 60 to 70 dBA L_{eq} at 3 feet from the source. Depending on the distance between proposed residential dwellings, noise levels associated with exterior AC units located within 10 feet of residential dwellings could potentially exceed 60 dBA L_{eq} . Normally, on very hot days all windows would be closed, as the air conditioning units would be operating. On moderate days, however, some households may elect to open windows, allowing for cross ventilation rather than operating the air conditioning unit. Under these conditions and assuming that centralized heating, ventilation, and air conditioning (HVAC) systems were not installed so that windows could remain closed, the predicted interior noise levels could potentially exceed the City's interior noise standard of 45 dBA L_{eq} . As a result, increased noise levels associated with proposed residential land uses would be considered **potentially significant**.

Neighborhood Park

The proposed project includes development of a neighborhood park, as well as various open space areas dispersed throughout the Area Plan. The park and open space will be managed as City of Shasta Lake facilities subject to the City's rules and regulations regarding park usage. The

specific uses to be included in the proposed park have not yet been identified. Park uses typically include children's play areas, parking areas, and recreational uses such as ball fields. Noise typically associated with play areas and associated vehicle parking areas include the voices of adults and children and the occasional opening and closing of vehicle doors.

The noise-generation potential of on-site recreational uses would be primarily associated with larger ball fields (i.e., soccer fields, baseball fields, basketball courts, etc.) used for competitive events. Noise levels associated with smaller recreational uses, such as volleyball courts and basketball courts, do not typically involve large numbers of spectators and as a result are typically considered minor sources of noise. Noise generated by larger recreational facilities is primarily associated with the cheering and yelling of spectator crowds. Based on noise measurements conducted for similar projects, average hourly exterior noise levels typically associated with day-use soccer fields and basketball and volleyball courts typically average less than 60 dBA L_{eq} at approximately 50 feet, with maximum intermittent noise levels of up to approximately 90 dBA L_{max} at 10 feet. Events involving the use of amplified sound systems can generate noise levels of approximately 75 dBA L_{eq} at 50 feet.

Recreational uses involving use of amplified sound systems or activities occurring during the more noise-sensitive evening, nighttime, and early morning hours may result in substantial increases in ambient noise levels at nearby existing or proposed residences, which could exceed the City's exterior and interior noise standards. Increases in ambient noise levels during the nighttime hours may result in increased levels of annoyance and sleep disruption. The park and open space areas will be constructed as a part of the proposed project but will be managed by the City of Shasta Lake. The City's General Plan includes operational restrictions that reduce conflict with adjacent residential uses. These restrictions include standards for amplified public address systems and operating times of the park areas. For these reasons, potential increases in ambient noise levels associated with proposed park uses are considered **less than significant**.

Noise from the open space and trail areas is likely to result from pedestrian activities such as talking and shouting. Motorized vehicles, other than maintenance vehicles and electrically powered carts, wheelchairs, etc., will generally be prohibited on the trail system. The normal usage of the trail system is not expected to generate noise, and this impact is considered **less than significant**.

Commercial

The proposed project includes development of approximately 30 to 60 acres of commercial land uses. However, the specific types of commercial uses to be developed have not yet been determined. Potential sources of noise associated with these types of land uses can vary substantially. Noise sources commonly associated with such uses can include occasional parking lot activities (e.g., opening and closing of vehicle doors, people talking), loading dock operations (e.g., use of forklifts, hydraulic lifts), trash compactors, and air compressors. Noise commonly associated with commercial land uses, such as idling trucks, vehicle backup alarms, decompression of trailer truck brakes, forklifts, and other material loading and unloading activities, can generate intermittent noise levels of approximately 90 dBA L_{max} at 10 feet. Average-hourly noise levels associated with commercial sources typically range from approximately 60 to 65 dBA L_{eq} at 50 feet.

Operational noise levels associated with the proposed commercial land uses could potentially exceed the City's exterior and interior noise standards at nearby noise-sensitive receptors. In addition, increases in single-event noise levels, such as backup alarms from material delivery trucks, occurring during evening and nighttime hours could result in increased levels of

4.5 NOISE

disturbance and sleep disruption to occupants of nearby residential dwellings. Increased noise levels associated with proposed commercial land uses would be considered **potentially significant**.

Mitigation Measures

MM 4.5.3a The following mitigation measures shall be applied to all residential development within the Area Plan:

- Residential dwellings shall be equipped with central heating and air conditioning systems to allow closure of windows during inclement weather conditions.
- Exterior air conditioning units located within 10 feet of adjacent residential dwellings shall be low-noise-rated and shielded from direct line of sight to adjacent residential dwellings. Shielding may include, but is not limited to, the use of wood fencing, provided no visible air gaps are detectable between individual panels. Use of tongue-and-groove or overlapping panels is recommended.
- The Development Services Director or his/her designee may allow alternative design based on the recommendations of an acoustical consultant.

Timing/Implementation: *Verified prior to issuance of a building permit*

Enforcement/Monitoring: *City of Shasta Lake Development Services Department*

MM 4.5.3b The following mitigation measures shall be applied to all commercial development within the Area Plan:

- The City shall require an acoustical assessment to be performed prior to construction of the proposed commercial land uses. Where acoustical analysis determines that stationary source noise levels would exceed applicable noise standards as set forth in this Draft EIR, the City shall require the implementation of noise attenuation measures sufficient to achieve compliance with applicable noise standards at nearby noise-sensitive land uses. Such measures may include, but are not limited to, the incorporation of setbacks, sound barriers, berms, or equipment enclosures.

Timing/Implementation: *Prior to issuance of building permit*

Enforcement/Monitoring: *City of Shasta Lake Development Services Department*

Implementation of mitigation measures **MM 4.5.3a** and **MM 4.5.3b** would ensure that predicted noise levels at nearby noise-sensitive land uses would not exceed applicable City noise standards. This impact would be considered **less than significant**.

Compatibility of Proposed Land Uses with Projected On-Site Noise Levels (Standard of Significance 3)

Impact 4.5.4 Projected on-site transportation noise levels at nearby proposed on-site development would exceed the City's noise sensitivity standards for land use compatibility. As a result, this impact would be considered **potentially significant**.

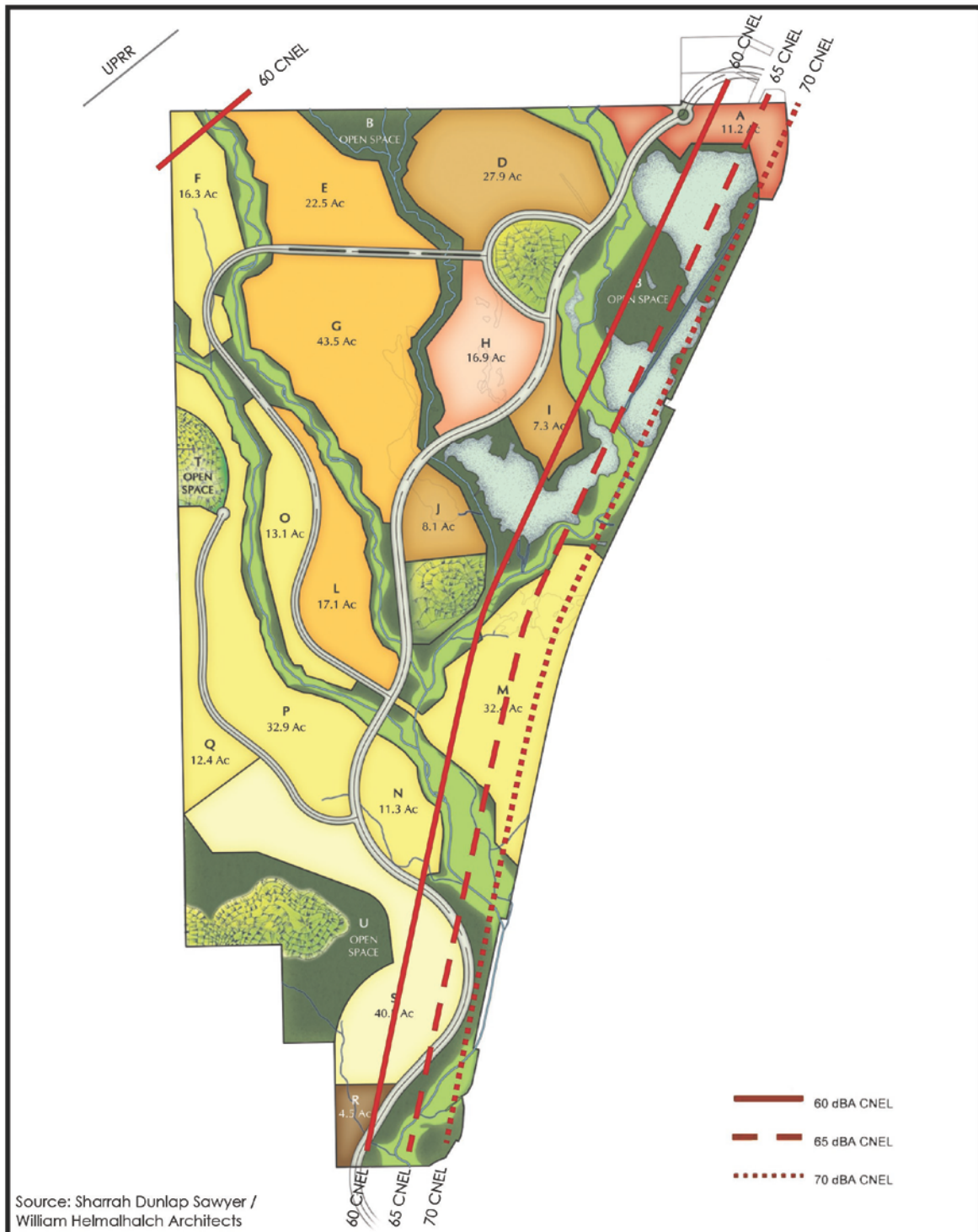
As previously noted, the proposed project includes a mix of various land uses, including residential, park, and commercial uses. On-site land uses would be primarily affected by Interstate 5, which is located along the eastern boundary of the project site, and the UPRR rail line located near the northern and western site boundaries. Noise contours for these transportation noise sources in relation to the project site are depicted in **Figure 4.5-3** and discussed separately below.

UPRR

The UPRR rail line is located at varying distances along the western and northern boundaries of the project site. Proposed residential land uses located nearest the railway are located in the northwestern portion of the project site, approximately 400 feet from the UPRR main line. The FTA's *Transit Noise and Vibration Impact Assessment* guidelines (2006) were used for the calculation of wayside noise levels generated by the trains traveling along the UPRR corridor. Wayside noise levels were calculated taking into account average train speeds, train length, and the number of trains traveling during the daytime and nighttime hours. Wayside noise levels were calculated assuming an equal distribution of freight train traffic during the daytime and nighttime hours.

As noted in **Table 4.5-3**, the projected wayside noise levels along the UPRR corridor are estimated to be approximately 78 dBA CNEL at 50 feet from the track centerline. The projected 60 dBA CNEL noise contour for the UPRR corridor would extend to a distance of approximately 855 feet from the track centerline. At the northwestern corner of the project site, the railway passes within approximately 500 feet of the project site. At this location, the 60 dBA CNEL contour of the UPRR corridor would extend approximately 355 feet onto the project site. Based on the modeling conducted, the predicted 65 and 70 dBA CNEL contours of the UPRR would not extend onto the project site. Residential land uses located in the northwestern portion of the project site and within approximately 855 feet of the UPRR track could be exposed to noise levels that would exceed the "normally acceptable" noise level of 60 dBA L_{dn} /CNEL. This impact would be considered **potentially significant**.

4.5 NOISE



Not to scale
N

Mountain Gate at Shasta, Predicted Transportation: Source Noise Contours

Figure 4.5-3

PMC

Interstate 5

For determination of land use compatibility, predicted traffic noise contours (in dBA L_{dn} /CNEL) for I-5 were modeled for future cumulative (Year 2030) conditions with implementation of the proposed project. Traffic noise levels were modeled using the FHWA traffic noise prediction model. **Table 4.5-9** summarizes predicted distances to the 60 and 65 dBA L_{dn} /CNEL contours, as well as the predicted traffic noise level at a distance of approximately 100 feet from the near travel lane centerline. The predicted noise contour distances do not take into account shielding or reflection of noise from existing terrain or existing/future structures.

Based on the traffic noise modeling conducted, the projected future traffic noise level for I-5 would be 70.5 dBA CNEL near the eastern boundary of the project site, approximately 100 feet from the near travel lane of the freeway. The projected future 65 and 60 dBA CNEL noise contours of I-5 would extend to approximately 382 and 819 feet from the roadway centerline, respectively. Predicted traffic noise levels at proposed on-site residential land uses located within approximately 819 feet of the centerline of I-5 could therefore exceed the City's minimum acceptable noise standard of 60 dBA CNEL (see **Table 4.5-5**). In addition, proposed commercial land uses located within approximately 181 feet of the I-5 centerline could be exposed to projected traffic noise levels in excess of the City's noise standard of 65 dBA CNEL. Because predicted future traffic noise levels at proposed on-site land uses would be projected to exceed the City's noise standards, this impact would be considered **potentially significant**.

TABLE 4.5-9
PREDICTED TRANSPORTATION NOISE LEVELS
FUTURE (YEAR 2030) CONDITIONS

Roadway Segment	CNEL at 100 feet from Near Travel Lane Centerline (dBA CNEL)	Distance from Source Centerline to Predicted Noise Contour (dBA CNEL)		
		60	65	70
Interstate 5, SR 151 to Mountain Gate Boulevard	70.5	819	382	181.2

Source: Ambient 2007

Notes: Traffic noise levels were calculated using the FHWA roadway noise prediction model (FHWA-RD-77-108) based on data obtained from the California Department of Transportation (Caltrans).

Mitigation Measures

MM 4.5.4

Applicants for subsequent project-level development approvals within the Mountain Gate at Shasta Area Plan shall be required to prepare an acoustical assessment evaluating on-site noise levels at proposed residential dwellings. The assessment shall address residential land uses located within 855 feet of the UPRR centerline, residential land uses located within 819 feet of the I-5 centerline, commercial land uses located within 382 feet of the I-5 centerline, and residential dwellings located along proposed on-site major roadways (i.e., 5,000 ADT or greater). Mitigation measures shall be identified to reduce predicted transportation noise levels at on-site receptors to below the City's acceptable exterior and interior noise sensitivity standards. Mitigation measures commonly applied to reduce transportation noise levels may include, but are not limited to, the following:

4.5 NOISE

- Construction of sound barriers to shield on-site land uses from line of sight of the noise source.
- Orientation of on-site structures to shield more noise-sensitive land uses from line of sight of the noise source or use of open-space areas to provide increased setback distances to noise-sensitive land uses.
- Incorporation of increased insulation and noise-reduction features (e.g., sound-rated windows and doors) in building design and construction.

Timing/Implementation: Prior to approval of subsequent tentative subdivision maps or other discretionary permits and/or issuance of grading or building permits as applicable.

Enforcement/Monitoring: City of Shasta Lake Development Services Department

Implementation of the above mitigation measures would reduce exterior transportation noise levels at nearby receptors and would ensure that interior noise levels would not exceed applicable noise standards. However, exterior transportation noise levels at some nearby residences may still exceed the City's noise standard. As a result, this impact would be considered **significant and unavoidable**.

Exposure of Persons to or Generation of Excessive Groundborne Vibration and Noise Levels (Standard of Significance 4)

Impact 4.5.5 Short-term construction and long-term operation of the proposed land uses would not exceed commonly applied thresholds for the prevention of structural damage or human annoyance. This would be a **less than significant** impact.

The effects of groundborne vibration can vary from no perceptible effects at the lowest levels, low rumbling sounds and detectable vibrations at moderate levels, and slight damage to nearby structures at the highest levels. At the highest levels of vibration, damage to structures is primarily architectural (e.g., loosening and cracking of plaster or stucco coatings) and rarely results in structural damage.

There are no federal, state, or local regulatory standards for vibration. However, various criteria have been established to assist in the evaluation of vibration impacts. For instance, the California Department of Transportation (Caltrans) has developed vibration criteria based on human perception and structural damage risks. For most structures, Caltrans considers a peak particle velocity (ppv) threshold of 0.2 inches per second to be the level at which architectural damage (i.e., minor cracking of plaster walls and ceilings) to normal structures may occur. Below 0.10 inches per second, there is virtually no risk of "architectural" damage to normal buildings. Levels above 0.4 inches per second may possibly cause structural damage (Caltrans 2002). In terms of human annoyance, continuous vibrations in excess of 0.1 inches per second ppv are identified by Caltrans as the minimum level perceptible level for ground vibration. Short periods of ground vibration in excess of 0.2 inches per second can be expected to result in increased levels of annoyance to people within buildings (Caltrans 2002).

Short-Term Construction

Site preparation and building construction activities associated with the proposed project are anticipated to require the use of various types of off-highway equipment (e.g., graders, backhoes, off-highway trucks) that would be expected to result in minor intermittent increases in ground vibration. The ground vibration levels associated with various types of construction equipment are depicted in **Table 4.5-10**.

TABLE 4.5-10
REPRESENTATIVE VIBRATION SOURCE LEVELS FOR CONSTRUCTION EQUIPMENT

Equipment	Peak Particle Velocity at 25 Feet (in/sec)
Large Bulldozer	0.089
Loaded Trucks	0.076
Jackhammer	0.035
Small Bulldozer	0.003
Caisson Drilling	0.089

Source: Ambient 2007

Groundborne vibration levels associated with site preparation and building construction, as noted in **Table 4.5-10**, would result in maximum vibration levels of approximately 0.09 inches per second ppv at 25 feet. Construction activities would not be anticipated to occur within 25 feet of existing structures. Based on the vibration levels noted in **Table 4.5-10**, predicted groundborne vibration levels at nearby structures would therefore not be anticipated to exceed the commonly applied minimum thresholds of 0.2 inch per second ppv for structural damage or 0.1 inch per second ppv for human annoyance. As a result, groundborne vibration levels associated with construction activities would be considered **less than significant**.

Long-Term Operation

Long-term operational activities associated with the proposed project would not involve the use of any equipment or processes that would result in potentially significant levels of groundborne vibration. However, as previously discussed, the proposed project site is located adjacent to the UPRR corridor.

Trains can generate relatively high levels of ground vibration levels, depending on various factors, including train speed and weight, condition of track, and amount of ballast used to support the track. Based on measurements conducted by Caltrans, the highest ground vibration measurement obtained for a freight train measured 9.1 millimeters per second (0.36 inch per second) at 3 meters (10 feet). Based on this measurement, Caltrans has developed screening criteria to estimate maximum anticipated ground vibration levels at varying distances from a railroad track. According to Caltrans, architectural damage due to train-generated ground vibration may occur for structures located within approximately 25 feet of the track centerline. Based on this same assumption, groundborne vibration levels readily perceptible to humans could occur within approximately 80 feet of track centerlines, and increased levels of annoyance would be anticipated to occur at distances up to approximately 200 feet of the track centerline (Ambient 2007).

4.5 NOISE

As previously noted, the proposed project site is located within approximately 400 feet of the UPRR corridor. At this distance, on-site land uses would not be exposed to groundborne vibration levels that would result in structural damage or increased levels of annoyance. As a result, long-term exposure to groundborne vibration would be considered **less than significant**.

Mitigation Measures

None required.

4.5.4 CUMULATIVE SETTING, IMPACTS, AND MITIGATION MEASURES

The geographic extent of the cumulative setting for noise consists of the project area and the surrounding areas within the city, since noise is a localized phenomenon. Cumulative development conditions would result in increased cumulative roadway noise levels and would also result in increased noise associated with future development. The primary factor for cumulative noise impact analysis is the consideration of future traffic volumes that will generate noise impacting on-site uses.

Cumulative Contribution to Traffic Noise Levels

Impact 4.5.6 Implementation of the proposed project would not result in a substantial contribution to future cumulative traffic noise levels. This would be a **less than cumulatively considerable** impact.

Predicted increases in ambient noise levels attributable to the proposed project at nearby existing off-site receptors would be primarily associated with potential increases in traffic noise levels along area roadways. The FHWA roadway noise prediction model was used to predict traffic noise levels along affected roadways based on data obtained from the traffic analysis prepared for this project. The project's contribution to the cumulative traffic noise levels along area roadways was determined by comparing the predicted noise levels with and without project-generated traffic under cumulative conditions. Predicted cumulative traffic noise levels are summarized in **Table 4.5-11**.

TABLE 4.5-11
PREDICTED INCREASES IN TRAFFIC NOISE LEVELS FOR FUTURE CUMULATIVE CONDITIONS (YEARS 2020 AND 2030)

Roadway Segment	CNEL (dBA) at 50 Feet from Near Travel Lane Centerline							
	Year 2020				Year 2030			
	Without Project	With Project	Predicted Increase	Significant?	Without Project	With Project	Predicted Increase	Significant?*
Shasta Dam Blvd., North Blvd. to Ashby Road	63.64	63.77	0.13	No	63.68	63.82	0.14	No
Ashby Road, Fort Peck Street to Flower Street	60.61	61.79	1.18	No	60.37	61.61	1.24	No
Montana Ave., Main Street to Front Street	55.78	58.36	2.58	No	55.78	58.36	2.58	No
Red Bluff Street, Washington Ave. to Grand River Ave.	50.32	54.57	4.25	No	50.32	54.57	4.25	No
Main Street, Washington Ave. to Grand River Ave.	51.75	56.04	4.29	No	51.68	55.98	4.30	No
Mussel Shoals Avenue, Front Street to Shasta Dam Blvd.	59.68	61.84	2.16	No	59.68	61.84	2.16	No
Grand Coulee Blvd., Fort Peck St. to Shasta Dam Blvd.	59.68	59.93	0.25	No	59.68	59.93	0.25	No
Pine Grove Avenue, Lake Blvd. to Ashby Road	63.19	63.52	0.33	No	63.38	63.68	0.30	No
Cascade Blvd., Pine Grove Ave. to Deer Creek Ave.	62.35	63.35	1.00	No	62.70	63.63	0.93	No
Pine Grove Ave., Smith Ave. to Cascade Blvd.	63.72	63.89	0.17	No	63.85	64.03	0.18	No

Source: Ambient 2007

Notes: Traffic noise levels were predicted using the FHWA Traffic Noise Model based on data obtained from the traffic analysis prepared for this project. Predicted noise levels do not take into account shielding provided by intervening structures or existing noise barriers.

* For purposes of this analysis, increases in ambient noise levels of 5 dBA would be considered significant in areas where the ambient noise environment is less than 60 dBA. In areas where the ambient noise environment is between 60 and 65 dBA, increases of 3.0 dBA, or greater, would be considered significant. In areas where the ambient noise environment exceeds 65 dBA, a predicted increase of 1.5 dBA, or greater, would be considered significant.

4.5 NOISE

Based on the modeling conducted, implementation of the proposed project in conjunction with additional cumulative development would result in predicted increases in future traffic noise levels of approximately 4.3 dBA CNEL or less. Implementation of the proposed project would not make a cumulatively considerable contribution to increases in traffic noise levels along area roadways located in the vicinity of existing noise-sensitive land uses. Therefore, this impact would be considered **less than cumulatively considerable**.

Mitigation Measures

None required.

REFERENCES

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4.6 BIOLOGICAL RESOURCES

This section addresses potential impacts of the project on biological resources. Biological resources include vegetation communities, wildlife communities, sensitive species, and sensitive habitats. Information for this section is based on a biological study conducted and prepared by North Fork Associates in 2006. This biological study was updated in February 2012 in order to review recent California Natural Diversity Database (CNDDB) information and to determine if site conditions remain the same. These studies are included in their entirety as **Appendix 4.6-1** and **Appendix 4.6-2**. North Fork Associates and Salix Consulting also conducted a delineation of jurisdictional waters, which is included as **Appendix 4.6-3**. Included as **Appendix 4.6-4** is a wetland delineation for the off-site area that will be impacted by the roadway extension to Cascade Boulevard.

Note to the reader: As of January 1, 2013, the agency formerly known as the California Department of Fish and Game (CDFG) changed its name to the California Department of Fish and Wildlife (CDFW). For purposes of this discussion, the agency names and abbreviations are interchangeable.

4.6.1 EXISTING SETTING

REGIONAL SETTING

The proposed project is located in the City of Shasta Lake in Shasta County. This region of California is characterized as a dissected plain located between the Klamath Range and Trinity Mountains to the north and west, and the northernmost extent of the Sierra Nevada foothills and the southernmost extent of the Cascade Range to the east. The plain is highly dissected by streams that drain toward the Sacramento River. Slopes range from nearly level to very gentle on remnants of depositional surfaces to moderately steep to steep in ravines (USDA 1997).

Climatic conditions in the general area are characterized by a Mediterranean climate with cool, wet winters and hot, dry summers. The average annual temperature is approximately 75° Fahrenheit and precipitation is approximately 63 inches per year. Monthly mean maximum temperatures range from a high of 95°F in July to a low of 39°F in January. Daily high temperatures commonly exceed 100°F during the summer. Predominant upland vegetation communities in the region include blue oak woodland, oak-pine woodland, oak savannah, chaparral, and annual grassland. Aquatic environments in the region include seasonal and perennial streams that drain to the Sacramento River; vernal pools and other seasonal wetlands; freshwater marsh; groundwater seeps; and man-made ponds and reservoirs.

LOCAL SETTING

The proposed project site comprises approximately 590 acres and is situated in the northeastern portion of the City of Shasta Lake (**Figure 3.0-1**). The project site is undeveloped and contains numerous dirt roads and trails; the north and northwest boundaries adjoin undeveloped land. Much of the site is used by local off-highway vehicle riders. Adjacent land uses in the surrounding area include urban residential and rural residential development, an elementary school, and Interstate 5 (I-5). Existing topography within the project site generally consists of relatively flat areas adjacent to I-5, with rolling hills and drainages at the south and western edges of the property.

4.6 BIOLOGICAL RESOURCES

HABITAT TYPES

Habitat types identified within the proposed project site include oak woodland, seasonal wetland, intermittent streams, and annual grassland. The approximate locations and acreages of the habitat types are presented in **Figure 4.6-1**.

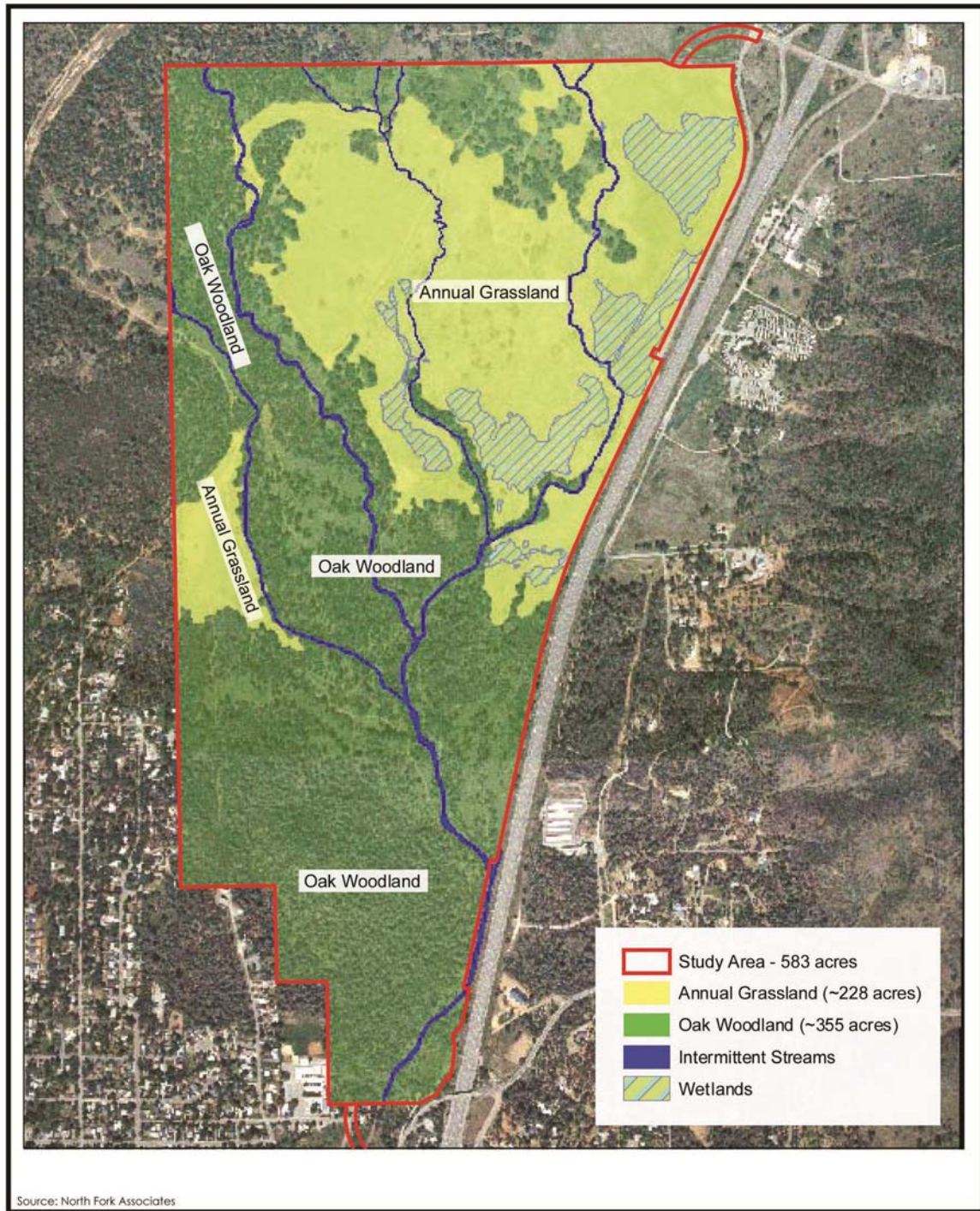
Oak Woodland

Oak woodland occupies the majority of the project site. Valley oak, blue oak, and interior live oak are the dominant tree species. Foothill pines are present and are widely scattered throughout the property. Valley oak is more abundant along the open meadows, whereas blue oak, interior live oak, and foothill pine are more suited to drier locations. While no active nests were detected during previous field surveys, numerous taller oaks and pines located throughout the site are expected to provide important seasonal nesting habitat for raptors (Salix 2012). The shrub layer varies from dense to absent, depending on factors such as slope and soil depth. Common shrubs include white leaf manzanita, poison oak, toyon, coffeeberry, and buck brush. The herbaceous (non-woody) understory is made up of a combination of ruderal and native species. Abundant herbaceous species observed included hedgehog dogtail grass, crane's-bill geranium, clover, buttercup, sanicula, yellow star-thistle, and blue wildrye. The oak woodland on the project site is typical of such habitats in the region at this elevation.

Annual Grassland

The annual grassland occurs primarily in the northern areas and consists of medusa head, soft chess brome, ripgut brome, chicory, yellow star-thistle, and hedgehog dogtail grass. Native species observed included western buttercup, white brodiaea, blue wildrye, and Fitch's spikeweed.

Large areas of herbaceous wetlands are embedded into the annual grassland habitat. These areas appear to be driven by seasonal high groundwater as well as surface runoff. They are dominated by yampah, common velvet grass, dallis grass, iris-leaf rush, Italian ryegrass, and other wetland generalists.



NOT TO SCALE



Figure 4.6-1
Habitat Map
Mountain Gate at Shasta

PMC

4.6 BIOLOGICAL RESOURCES

Waters of the United States and Wetlands

The term “waters of the US” is defined as:

- All waters which are currently used, or were used in the past, or may be susceptible to use in interstate or foreign commerce, including all waters which are subject to the ebb and flow of the tide.
- All interstate waters including interstate wetlands.
- All other waters such as intrastate lakes, rivers, streams (including intermittent streams), mudflats, sandflats, wetlands, sloughs, prairie potholes, wet meadows, playa lakes, or natural ponds, the use degradation of which could affect interstate or foreign commerce including any such waters.

“Wetlands” are defined as:

- Waters of the US or isolated features that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions.

A wetland delineation on the Mountain Gate at Shasta project site was conducted during 2004–2006 (North Fork Associates 2006). The delineation was verified by USACE on May 6, 2008.

On December 6, 2011, Salix Consulting, on behalf of the applicant, submitted a Section 404 Individual Permit application to USACE (SPK-2005-00827) (**Appendix 4.6-6**). According to USACE, this application was withdrawn in March 2012. Although attachments to the application include an exhibit with a lotting pattern, the applicant included this in the USACE application for illustrative purposes only and it does not take into consideration development constraints, such as topography, that might limit density. Subsequent verification and approval from USACE will be required prior to issuance of a grading permit by the City.

The majority of the project site is oak woodland while a large upland/wetland grassland complex occurs along I-5. The site contains two named creeks, Moody Creek and Rancheria Creek, that flow north to south through the site and off the site to the south. A total of 57.55 acres of waters of the United States have been mapped, represented by ephemeral streams, intermittent streams, wetland swales and seasonal wetlands. **Table 4.6-1** provides an acreage summary of the preliminary delineation results, including the off-site area to the south for the proposed roadway extension; see **Figure 4.6-2** for location and acreage detail. These waters of the US are subject to United States Army Corps of Engineers (USACE) and/or Regional Water Quality Control Board (RWQCB) jurisdiction. The intermittent and ephemeral creeks are also subject to California Department of Fish and Wildlife (CDFW) jurisdiction.

TABLE 4.6-1
WATERS OF THE US ACREAGE SUMMARY: PRELIMINARY DELINEATION RESULTS

Classification	Acreage		
	Existing	Impacted	Preserved
<i>Wetlands</i>			
Ephemeral Stream	0.71	0.38	0.33
Intermittent Stream	8.43	0.36	8.07
<i>Other Waters</i>			
Wetland Swales	1.58	0.16	1.42
Seasonal Wetlands	46.88	10.76	36.12
Drainage Ditch (off-site)	0.22	0	0.22
Total Waters of the US	57.82	11.66	46.16

Source: Salix 2012

As mentioned, two named creeks—Moody Creek and Rancheria Creek—occur within the Area Plan site, and other unnamed tributaries are also present throughout the site. The source of these creeks is on the south side of Saddle Back, a ridge that separates the site from Shasta Lake. Most of the stream acreage is intermittent and has some groundwater source component. The unnamed stream associated with the large wetland area in the eastern portion of the site has a substantial groundwater component (Salix 2012). The geotechnical report for the site indicates the presence of unfractured rock under most of the site between 5 and 15 feet deep. The water source for the large wetlands is unknown, but water perched on unfractured rock probably contributes to the wetland hydrology (Salix 2012).

Rancheria Creek converges with Moody Creek in the south-central portion of the Area Plan. Moody Creek then flows off-site at the southern property boundary and eventually flows into Stillwater Creek, a major tributary to the Sacramento River. Stillwater Creek flows in a southerly direction and into the Sacramento River approximately 20 miles to the south, just north of the City of Anderson.

Both Moody Creek and Rancheria Creek were dry during the July 2006 surveys, and all streams were dry by the August 2006 wildlife survey (Salix 2012). During a January 2012 site visit, Rancheria and Moody creeks were flowing at approximately 5 cubic feet per second. Smaller unnamed drainages throughout the site also had variable amounts of surface flow or had pockets of standing water at the time of the January site visit. Moody and Rancheria creeks are expected to flow throughout much of the rainy season and possibly retain pockets of surface water into the late spring or early summer months, depending on rainfall conditions (Salix 2012). However, none of the creeks located on site are expected to retain surface water throughout the dry season (Salix 2012).

Ephemeral Stream

An ephemeral stream has flowing water only during, and for a short duration after, precipitation events in a typical year. Ephemeral streambeds are located above the water table year-round. Groundwater is not a source of water for the stream. Runoff from rainfall is the primary source of water for stream flow. On the project site, ephemeral streams are represented by rocky channels

4.6 BIOLOGICAL RESOURCES

that lack hydrophytic vegetation. Nine ephemeral streams were mapped on the project site (North Fork Associates 2005).

Intermittent Stream

An intermittent stream has flowing water during certain times of the year, when groundwater provides water for stream flow. During dry periods, intermittent streams may not have flowing water. Runoff from rainfall is a supplemental source of water for stream flow. On the project site, intermittent streams are represented by rocky channels that flow for at least half of the year and generally support sparse hydrophytic vegetation such as willows. The two primary intermittent drainages are named Moody and Rancheria Creeks on the Project City USGS. These two creeks are similar in nature on the project site. Intermittent streams were mapped on the project site (North Fork Associates 2005).

Wetland Swale

Wetland swales are areas through which water may flow during periods of rainfall, but not with enough duration or intensity to produce the bed-and-bank morphology more typical of stream channels. Wetland swales support a high degree of hydrophytic vegetation cover, often similar to what grows in nearby seasonal wetlands. The Mountain Gate at Shasta Area Plan project site supports several wetland swales, which typically connect with seasonal wetlands.

Seasonal Wetland

Seasonal wetlands are areas of seasonal saturation that support hydrophytic vegetation. On the project site, most of these areas are located on low-gradient slopes trending to the south. Other areas are depressions found in sloped areas. These areas do not support vernal pool flora and hence were not classified as such.

Hydrology of the seasonal wetlands appears to be driven by seasonal high groundwater as well as surface runoff. The large wetlands along I-5 (see **Figure 4.6-2**) appear to have well-drained soils in the upper part but exhibit redoximorphic characteristics. North Fork Associates discovered a corresponding soil/plant pattern for many of these areas. The yampah edge followed closely to the edge of hydric soils. Yampah is a NL (Not Listed) species but clearly behaves as a wetland species in this area.

Other dominant species in the wetlands are velvet grass, pennyroyal, coyote thistle, and iris-leaf rush. Edge species tend to be dallis grass and Italian ryegrass. Chicory is abundant in the grassland areas and occurs outside the wetlands. It represents a good upland species in these areas.

WILDLIFE

Overall, the project site is expected to support a wide diversity of wildlife due to the availability of important habitat features, including nesting sites, escape and thermal cover, and a variety of food sources. In addition, ephemeral and intermittent streams located on-site provide seasonal sources of water for wildlife of the area. Woodland communities, such as those located throughout the site, are important for animal cover and provide excellent roosting and nesting opportunities for birds and shelter for mammals. Snags located throughout the site provide nesting cavities for birds such as owls, woodpeckers, and bluebirds. Taller trees of the site provide good nesting habitat for raptors such as great horned owl, red-tailed hawk, and red-shouldered hawk (Salix 2012).

The following animals were observed in association with annual grassland of the project site during field surveys: California ground squirrel, American robin, western scrub jay, mourning dove, California quail, spotted towhee, western kingbird, house finch, American crow, sharp-shinned hawk, barn swallow, and turkey vulture. In addition, red-tailed hawks, red-shouldered hawks, and a sharp-shinned hawk were observed flying over both woodland and grassland areas during the various field surveys. Signs of black-tailed hare, mule deer, coyote, Botta's pocket gopher, and other small rodents were observed in grassland and open woodland habitats of the project site. The following animals were observed directly, or evidence of their occurrence was observed within woodland habitats of the project site during the field surveys: western gray squirrel, California towhee, western scrub-jay, oak titmouse, Anna's hummingbird, acorn woodpecker, yellow-rumped warbler, western fence lizard, and coyote (Salix 2012).

During the August 14, 2006, site visit, on-site drainages were dry in most locations; therefore, no aquatic species were present. Only a small portion of the easternmost unnamed drainage contained a few inches of standing water at the time of the site visit. Most drainages throughout the site, including the larger Moody and Rancheria creeks, were flowing at the time of the January 2012 survey and are expected to flow throughout the rainy season. Portions of the larger drainages have some limited potential to be used on a seasonal basis by anadromous fish species known from the region (Salix 2012).

The following species were detected in the vicinity of on-site drainages during the field surveys: black phoebe, raccoon, Sierran treefrog, striped skunk, and mule deer. A complete list of species observed during the field surveys is provided in **Appendix 4.6-1**.

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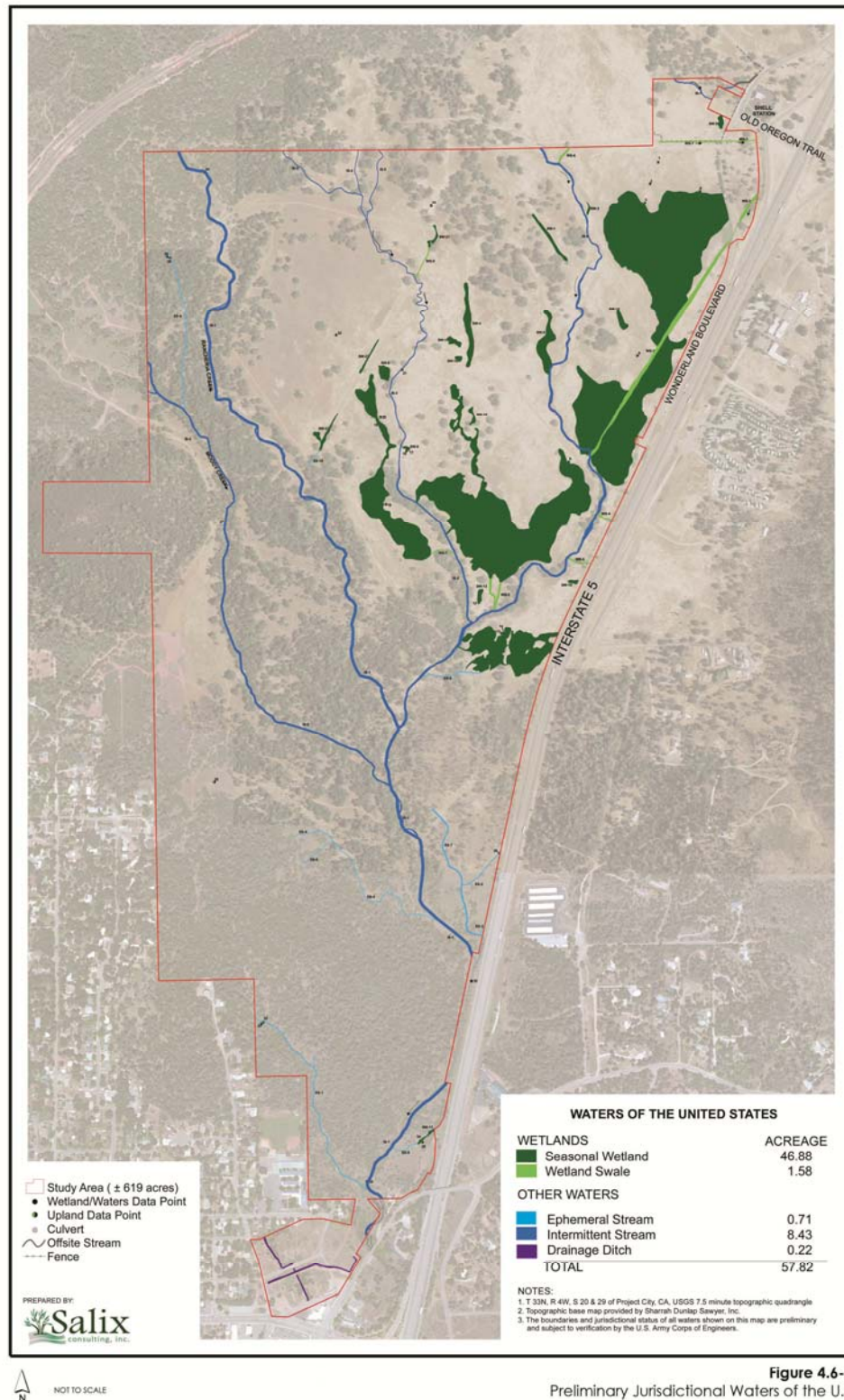


Figure 4.6-2
Preliminary Jurisdictional Waters of the U.S.
Mountain Gate at Shasta
PMC

SPECIAL-STATUS SPECIES

To determine which special-status species could occur on or near the project site and update previous information, Salix Consulting queried the California Natural Diversity Database (CDFW 2012) and the California Native Plant Society (CNPS) Inventory (2012) for reported occurrences of special-status fish, wildlife, and plant species in the region surrounding the project site. The nine-quadrangle search included the Project City, Enterprise, Redding, Shasta Dam, Minnesota Mountain, Palo Cedro, Bella Vista, O'Brien, and Bohemotash Mountain quadrangles (Salix 2012). Salix Consulting biologists also reviewed the following special-status species lists for the project vicinity:

- US Fish and Wildlife Service (USFWS) list of Federal Endangered and Threatened Species for the Project City US Geological Survey (USGS) quadrangle
- USFWS list of Federal Endangered and Threatened Species for Shasta County
- California Department of Fish and Game list of Species of Special Concern

For the purposes of this analysis, special-status species are those that fall into one or more of the following categories:

- Listed as endangered or threatened under the federal Endangered Species Act (or candidate species, or formally proposed for listing)
- Listed as endangered or threatened under the California Endangered Species Act (or proposed for listing)
- Designated as rare, protected, or fully protected pursuant to California Fish and Game Code
- Designated a Species of Special Concern by the California Department of Fish and Wildlife
- Ranked 1 or 2 maintained by the California Native Plant Society

Appendix 4.6-1 contains a list of special-status plants and special-status wildlife that may occur on the project site. Species requiring habitats not occurring in or around the project site and species occurring far outside the project site are not considered in **Appendix 4.6-1**. Field surveys and the best professional judgment of Salix Consulting biologists were used to further refine the tables in **Appendix 4.6-1**. In general, plants in CNPS Rank 3 and Rank 4 are not considered further. **Table 4.6-2** is a list of special-status species that occur on the site or that are rated possible or likely to occur. These species are discussed in more detail following the table.

The refined list of special-status species in the region of the project site includes 15 plants and 20 animals. Of the 15 plant species and 20 animal species, 7 plants and 3 animals were determined to either occur on-site or were rated possible or likely to occur because the site has some areas of suitable habitat or they are known from nearby locations. Several species rated unlikely to occur, or having no potential for occurring on-site, are listed below due to their high federal or state status.

4.6 BIOLOGICAL RESOURCES

**TABLE 4.6-2
SPECIAL-STATUS SPECIES WITH POTENTIAL TO OCCUR IN PROJECT AREA**

Common Name (Scientific Name)	Regulatory Status	General Habitat	Potential for Occurrence
Plants			
Ahart's paronychia (<i>Paronychia ahartii</i>)	CNPS/List 1B.1	Woodlands and grasslands	Unlikely. Marginal habitat is present.
Bellinger's meadowfoam (<i>Limnanthes floccosa bellingeriana</i>)	CNPS/List 1B.2	Mesic areas near wetlands	Possible. Could occur in wetlands.
western viburnum (<i>Viburnum ellopticum</i>)	CNPS/List 2.3	Hillsides	Possible. Suitable habitat on north-facing hillside in the brushy, southern portion of the Area Plan.
Sulfur Creek bordiaea (<i>Brodiaea matsonii</i>)	CNPA/1B.1	Intermittent streams	Possible. This species has been reported within approximately 8 miles from the Area Plan.
northern clarkia (<i>Clarkia borealis borealis</i>)	CNPS/List 1B.3	Forest and woodland openings	Possible. Suitable upland habitat is present.
Red Bluff dwarf rush (<i>Juncus leiospermus leiospermus</i>)	CNPS/List 1B.1	Seasonal wetlands and vernal pools	Possible. Could occur in wetlands.
silky cryptantha (<i>Cryptantha crinita</i>)	CNPS/List 1B.2	Gravelly streambeds	Possible. Suitable habitat occurs in two of the stream channels.
Invertebrates			
vernal pool fairy shrimp (<i>Branchinecta lynchi</i>)	FT	Vernal pools and seasonal wetlands	None. No suitable habitat occurs in two of the stream channels.
vernal pool tadpole shrimp (<i>Lepidurus packardii</i>)	FE	Vernal pools and seasonal wetlands	None. No suitable aquatic habitat (vernal pools) present on-site. Closest occurrences from east side of Redding.
Insects			
valley elderberry longhorn beetle (<i>Desmocerus californicus dimorphus</i>)	FT	Elderberry shrubs in woodlands and riparian habitats	Unlikely. No suitable habitat (elderberry shrubs) detected during field surveys.
Fish			
Central Valley steelhead (<i>Oncorhynchus mykiss</i>)	FT	Sacramento River and major tributaries below impassable barriers	Possible. Seasonal streams may provide some seasonal aquatic habitat. Known from Stillwater Creek watershed.

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Common Name (Scientific Name)	Regulatory Status	General Habitat	Potential for Occurrence
Chinook salmon – Central Valley fall/late fall run (<i>Oncorhynchus tshawytscha</i>)	SC/CSC	Sacramento River and major tributaries below impassable barriers	Possible. Seasonal streams may provide some seasonal aquatic habitat. Historic occurrences in Stillwater Creek watershed.
Chinook salmon – Central Valley spring-run (<i>Oncorhynchus tshawytscha</i>)	FT/CY	Sacramento River and major tributaries below impassable barriers	Unlikely. Not mapped as occurring in watershed. Known only from mainstem of the Sacramento River and major tributaries.
Chinook salmon – Sacramento River winter run (<i>Oncorhynchus tshawytscha</i>)	FE/CE	Mainstem of Sacramento River below impassable barriers	Unlikely. Not mapped as occurring in watershed. Occurs primarily in mainstem of Sacramento River.
Amphibians			
Shasta salamander (<i>Hydromantes shastae</i>)	CT	Cliff faces and vertical cavern walls associated mainly with limestone outcrops	Unlikely. No suitable habitat (limestone outcrops) present on-site. Isolated populations known from the east and north of the site, near Shasta Lake.
California red-legged frog (<i>Rana draytonii</i>)	FT / CSC	Deeper pools and streams with emergent or overhanging vegetation	None. No suitable aquatic habitat present in study area. No known occurrences in project region or county. Located outside of current range.
foothill yellow-legged frog (<i>Rana boylei</i>)	CSC	Partially-shaded shallow rocky streams; rarely found far from permanent water	None. No suitable aquatic habitat (perennial shallow streams) observed within study area.
Reptiles			
western pond turtle (<i>Emys marmorata marmorata</i>)	CSC	Permanent aquatic habitats with suitable basking sites and adjacent upland habitat	Unlikely. No suitable aquatic habitat, including ponds or slow-moving streams or rivers, present on-site. May occur in pools in lowermost reaches of Moody Creek.

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Common Name (Scientific Name)	Regulatory Status	General Habitat	Potential for Occurrence
Birds			
bald eagle (<i>Haliaeetus leucocephalus</i>)	CE	Lake margins and rivers; nests in large old-growth trees near water	Unlikely. No suitable nesting or foraging habitat present on-site. May occasionally fly over site.
American peregrine falcon (<i>Falco peregrinus anatum</i>)	CE / CFP	Nests in protected areas along cliffs or ledges usually near water	Unlikely. No suitable nesting or foraging habitat present on-site. May occasionally venture into site.
purple martin (<i>Progne subis</i>)	CSC	Summer visitor of woodlands and low elevation coniferous forests	Possible. Potential nesting habitat in snags and abandoned woodpecker cavities in woodland areas throughout site.
bank swallow (<i>Riparia riparia</i>)	CT	Colonial nester that nests along vertical banks and cliffs with fine-textured or sandy soils near water	None. No suitable nesting habitat, in the form of vertical banks or cliffs along streams or rivers, located within project site.
Mammals			
Townsend's big-eared bat (<i>Corynorhinus townsendii</i>)	CSC	Roosts in caves and mines or other human-made structures	Unlikely. No suitable roosting habitat present on-site. May periodically forage on-site.
spotted bat (<i>Euderma maculatum</i>)	CSC	Roosts in caves, rock crevices, and occasionally buildings	Unlikely. No suitable roosting habitat present on site. May periodically forage on-site.
Pacific fisher (<i>Martes pennanti pacifica</i>)	FC/SCT/CSC	Intermediate to large-tree conifer forests and riparian woodlands	Unlikely. No suitable dense forest habitat present on-site. Numerous occurrences to northwest, north, and northeast in the vicinity of Shasta Lake.

Source: Salix 2012

*Status Codes:

Federal

FE = Federal Endangered, FT = Federal Threatened, FP = Federal Proposed Species, FC = Federal Candidate Species, SC = National Marine Fisheries Service – Candidate

State

CE = California Endangered, CT = California Threatened, CR = California Rare (plants only), CSC = California Species of Concern, CFP = California Fully Protected, SCE = State candidate (endangered), SCT = State candidate (threatened)

CNPS

Rank 1B = Rare, Threatened, or Endangered in California, Rank 2 = Rare, Threatened, or Endangered in California, more common elsewhere – 1 - Seriously threatened in California, 2 - Fairly threatened in California, 3 - Not very threatened in California

**Definitions for the Potential to Occur:

None = Habitat does not occur. **Unlikely** = Some habitat may occur, but disturbance or other activities may restrict or eliminate the possibility of the species occurring. Habitat may be very marginal, or the study area may be outside the range of the species. **Possible** = Marginal to suitable habitat occurs, and the study area occurs within the range of the species. **Likely** = Good habitat occurs, but the species was not observed during surveys. **Occurs** = Species was observed during surveys.

SPECIES ACCOUNTS

The Area Plan site may support some of the special-status plant and animal species known to occupy on-site habitats.

Plants

Ahart's paronychia (*Paronychia ahartii*) is an inconspicuous, erect, annual member of the pink family (Caryophyllaceae). It lacks state or federal status, but is on the CNPS Rank 1B. Other members of the genus in California are introduced. Ahart's paronychia differs from these by being very short (less than 2 centimeters (cm) high rather than more than 2 cm) and annual (rather than perennial). It grows in rocky hard-packed soil, often at the edges of vernal pools, especially in volcanic uplands. It is found in Butte, Tehama, and Shasta counties, and it blooms from April to June. No members of the genus *Paronychia* were observed during field surveys. Several common introduced members of the pink family were found on the site.

Henderson's bent grass (*Agrostis hendersonii*) is an annual member of the grass family (Poaceae). It has no state or federal status. It is on the CNPS Rank 3, which is a watch list for species needing more information. Henderson's bent grass is very similar to the more common *Agrostis microphylla*, but its fruiting bodies are larger and it is restricted to vernal pools and mesic areas. It is found at scattered locations from Shasta County to Merced County. It blooms in April and May. An unidentified perennial bent grass was observed in wetlands on the property. However, this unknown species is a dense-growing perennial and not an annual like Henderson's bent grass.

Northern clarkia (*Clarkia borealis* subsp. *borealis*) is an annual member of the evening-primrose family (Onagraceae). This species lacks state or federal status, but it is on the CNPS Rank 1B. Northern clarkia has unlobed petals, toothed claw anthers extended beyond the petals, and an erect inflorescence recurved only at the tip. It grows in chaparral, woodland, and forest edges and openings in Trinity and Shasta counties, and it blooms from June to September. Only the common and widespread *C. purpurea* was observed on the site.

Red Bluff dwarf rush (*Juncus leiospermus* subsp. *leiospermus*) is a small, annual member of the family Juncaceae. This species lacks state or federal status, but it is on the CNPS Rank 1B.1. It grows in vernal moist areas in chaparral, cismontane woodland, and valley and foothill grasslands. This species blooms from March through May. Individuals of the plant were not detected on-site during field surveys.

Silky cryptantha (*Cryptantha crinita*) is a rough-hairy, annual member of the borage family (Boraginaceae). It lacks state or federal status and is on the CNPS Rank 1B. Silky cryptantha has a very dense inflorescence and it typically has only one nutlet, which is finely granular on the back. It grows in gravelly streambeds in a variety of habitats and is confined to Shasta and Tehama counties. It blooms in April and May. Several species of the similar genus *Plagiobothrys* were observed, but no members of the genus *Cryptantha* were found.

4.6 BIOLOGICAL RESOURCES

Wildlife

Due to the absence of suitable aquatic habitat, such as vernal pools, ponds, and perennial streams, several of the federally or state-listed species identified in **Table 4.6-2** were determined to have minimal to no potential for occurring on-site. Species with a high federal or state status or those determined to have a reasonable potential for occurring on-site are discussed below.

Included as **Appendix 4.6-5** is a Memorandum Report by Salix Consulting entitled Fairy Shrimp Habitat/Large Branchiopod Review, dated July 3, 2012.

Vernal pool fairy shrimp (*Branchinecta lynchi*), a federally threatened species, is a small crustacean that occurs in association with a variety of vernal pool habitats. This species has never been found in permanent bodies of water such as riverine habitats. While vernal pool fairy shrimp have been found in large vernal pools, individuals tend to occur in smaller pools often measuring less than 0.05 acres in area (Salix 2012). Vernal pool fairy shrimp are adapted to survive the seasonal flooding and drying of the pools in which they live. The average time of maturity of vernal pool fairy shrimp is 41 days, but can be as little as 18 days in warmer pools. After maturing, this species breeds and produces eggs that are dropped to the bottom of the pool. Adult fairy shrimp then die at the end of the wet season after the pool dries out. Remaining eggs are then protected throughout the dry season by a thick outer covering (Salix 2012).

The CNDDDB (CDFW 2012) documents eight occurrences of vernal pool fairy shrimp in the broader project region, with all being located east and southeast of Redding on the Millville and Stillwater plains areas. Suitable habitat for vernal pool crustaceans was not observed during field surveys associated with this assessment. Based on the absence of suitable habitat and distance from other known occurrences, vernal pool fairy shrimp is not expected to occur in the Area Plan.

Vernal pool tadpole shrimp (*Lepidurus packardii*), a federally endangered species, is a small crustacean that inhabits a wide variety of ephemeral aquatic habitats of the Central Valley (Salix 2012). This species has been observed in stock ponds, vernal pools, mud-bottomed pools, and other seasonal wetlands containing clear to highly turbid water. It is known to occur in vernal pools ranging in size from 7 square feet to 88 acres, with a variety of depths and volumes. The life history of this species is closely tied to the seasonal cycle of the vernal pool that it inhabits and similar to that of vernal pool fairy shrimp (refer to previous discussion). After winter rainwater fills the pool, the population is reestablished from cysts that lie dormant in the dry pool sediments. The species matures at approximately three to four weeks after the pools have been filled. Some cysts hatch immediately, while others remain dormant until the subsequent rainy season. The CNDDDB documents 19 occurrences of vernal pool tadpole shrimp in the broader project region, with all being located east and southeast of Redding on the Millville and Stillwater plains areas (Salix 2012). Based on the lack of suitable habitat on-site and distance from documented occurrences in the region, vernal pool tadpole shrimp is not expected to occur within the Area Plan.

Valley elderberry longhorn beetle (*Desmocerus californicus dimorphus*) is a federal threatened species. Live elderberry shrubs (*Sambucus nigra* subsp. *caerulea*) are this borer's exclusive host plant. Adult valley elderberry longhorn beetles (VELB) emerge from pupation inside the wood of these shrubs in the spring as their flowers begin to open. Exit holes made by the emerging adults are distinctive small oval openings (approximately ¼-inch width). Adults eat elderberry foliage until about June when they mate. Females lay eggs in crevices in the bark before dying a short time later. Upon hatching, the larvae then begin to tunnel into the shrub where they will spend one to two years eating the interior wood, which is their sole food source.

The CNDDDB documents only two occurrences of VELB in the project region, and the closest documented occurrence is from adjacent to the Sacramento River approximately 9 miles south of the project site (Salix 2012). No individual elderberry shrubs were detected within the project site during field surveys conducted in 2005, 2006, and 2012. Therefore, the absence of elderberries within the site, and potential habitat for VELB, could not be conclusively determined due to dense vegetative cover in some woodland areas. Particularly to the south, some of the areas could not be thoroughly surveyed during previous surveys. There remains a remote possibility for isolated shrubs to occur on-site.

Fall/late fall run Chinook (*Oncorhynchus tshawytscha*) is the largest of the Pacific coast salmon and currently the most abundant of the Central Valley races of salmon. Adult fall run Chinook salmon migrate from the ocean upstream into freshwater from July through December and spawn from early October through late December. Migration activity generally increases with seasonal rainstorms. Chinook salmon spawn in low-gradient portions of Central Valley rivers and major tributaries. Peak spawning activity occurs in October and November, although the timing varies from stream to stream. Spawning generally occurs in clean, loose gravel along swift, relatively shallow riffles. Embryo incubation occurs from October through March, and juvenile rearing and smolt outmigration occurs from January through June. Timing of outmigration is dependent on rainfall, but the majority of fall-run Chinook move downstream to the ocean during the first few months following emergence. After migrating to the ocean, chinook salmon generally mature at three to four years of age.

The CNDDDB does not document fall/late fall run Chinook as occurring in the project region (Salix 2012). However, this race of salmon has historically been documented as occurring in downstream areas along Stillwater Creek. The National Marine Fisheries Service's (NMFS) Historic Chinook Salmon Habitat Distribution Table documents fall run Chinook as historically occurring in Stillwater Creek, to approximately 20 miles upstream of the confluence with the Sacramento River, in the vicinity of Mountain Gate (Salix 2012). "CalFish" also maps Chinook as currently occurring in Stillwater Creek to approximately the State Route 44 crossing, just east of Redding (Salix 2012). Provided that there are no impassable barriers downstream of the Area Plan, there is some limited potential for individual fish to occur on-site throughout the rainy season when flow is present and substantial in the larger on-site drainages.

Essential Fish Habitat (EFH) is defined as "those waters and substrates necessary to fish for spawning, breeding, feeding, or growth to maturity." The Magnuson-Stevens Conservation and Management Act requires that all federal agencies consult with the NMFS on all actions that may adversely affect EFH. As part of preparation of this assessment, NMFS maps were reviewed to determine if any on-site or downstream drainages (Stillwater Creek) are designated as EFH.

EFH for Chinook was taken from the National Oceanic and Atmospheric Association's (NOAA) National Marine Fisheries Service Southwest Regional Office website in 2008. A review of the website indicates that EFH designations exist beyond the project site. Specifically, certain portions of Cow Creek and tributaries (located east of the project site) and Churn Creek (located west of the project site) are mapped as EFH. These drainages (Cow Creek and Churn Creek) flow directly into the Sacramento River, which is also designated as EFH.

As part of a site-specific Biological Resources Assessment (BRA), however, NMFS maps were also reviewed to determine if any on-site or downstream drainages (i.e., Stillwater Creek) and/or tributaries (i.e., Moody Creek and Rancheria Creek) were designated as EFH (Salix 2012). Upon review of the appropriate maps of the various races of Chinook salmon in the region, including fall run Chinook, the BRA concluded that "none of the on-site drainages of downstream areas

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along Stillwater Creek are designated as EFH.” Accordingly, the project will not result in any direct impacts to EFH.

While no direct impacts to EFH will occur as a result of the project, the potential for indirect impact could occur from untreated stormwater runoff entering the drainages and ultimately into the EFH. Such potential indirect impacts are further addressed in Section 4.7, Hydrology and Water Quality, and several mitigation measures are included in Section 4.7 to ensure compliance with state and federal laws regarding the quality of stormwater runoff. For example, mitigation measure **MM 4.7.2a** requires preparation of a water quality plan designed to retain sediment on-site by a system of sediment basins, traps, or other appropriate measures and to include a means of reducing “first flush” contaminants after construction, as well as plans for maintenance, funding, and scheduling for servicing the drainage system. Mitigation measure **MM 4.7.2c** requires that the final design include post-construction stormwater best management practices (BMPs) to mitigate for stormwater discharges associated with the post-development of the site. The BMPs must be incorporated into the project, as described in the application package, to treat stormwater runoff from the site. These measures, and others in Section 4.7, Hydrology and Water Quality, ensure that the construction and operation of the proposed project will not result in indirect impacts on EFH.

Central Valley steelhead (*Oncorhynchus mykiss irideus*) was listed by the NMFS in 1998 as threatened because it was determined to be in danger of extinction due to habitat destruction and degradation, as well as other factors. Steelhead is an anadromous form of rainbow trout that emigrates to the sea and later returns to fresh water to spawn. Unlike Pacific salmon, not all steelhead die after spawning. Steelhead spawn in winter or early spring after salmon have typically spawned. They often require high water to provide access to upper watershed and spawning and rearing areas. Spawning occurs in clean, loose gravels and swift, shallow water. They generally prefer shallower stream depths and smaller gravel than salmon, but prefer similar water velocities. Embryos hatch in about 30 days, and fry usually emerge about 4 to 6 weeks after hatching. Juvenile steelhead usually remain in freshwater for at least one year before out-migrating to the ocean. While in fresh water, young steelhead are typically found in cool, fast-flowing permanent streams and rivers where riffles predominate over pools and there is suitable riparian and in-stream cover (Salix 2012).

The CNDDDB does not document Central Valley steelhead as occurring in the project region (Salix 2012). However, “CalFish” maps show steelhead as occurring in Stillwater Creek to approximately the State Route 229 crossing, northeast of Redding (Salix 2012). Provided that there are no impassable barriers downstream of the Area Plan, there is some limited potential for individual fish to occur on-site during the rainy season when flow is suitable within the larger on-site drainages. Due to the ephemeral nature of the on-site streams, however, there is no summer rearing habitat for steelhead present on-site. Critical habitat for California Central Valley steelhead does not occur within the Area Plan. However, the mainstem of Stillwater Creek, located downstream of the study area, is currently designated as critical habitat for steelhead (Salix 2012).

Shasta salamander (*Hydromantes shastae*) is a state threatened species that is endemic to a small area near Shasta Lake in Shasta County. It is known to occur along cliff faces, vertical cavern walls, and in moist caves and rock cracks primarily associated with limestone outcrops. This small (4 to 6 inches total length), stocky salamander has a short tail, webbed feet, and flattened body. It is generally dark reddish brown in color above and mottled with grayish green to tan specks. This species of salamander is active at night during fall, winter, and spring rains. During the daytime, it can be found under surface objects. Adults lay eggs in moist limestone shelters in late summer and brood eggs until hatching in late fall (Salix 2012).

While the CNDDDB lists numerous occurrences of Shasta salamander in the project region, primarily along rocky outcrops in the vicinity of Shasta Lake, the project site lacks the specific habitat required for this species, consisting primarily of limestone caves and outcrops. Focused surveys for Shasta salamander conducted on a large property directly west of the site in 2010 resulted in no detection of individuals of this species (Salix 2012). Based on the lack of suitable habitat on-site, as well as the restricted occurrence of this species, no individuals of Shasta salamander would be expected to occur within the Area Plan.

California red-legged frog (*Rana draytoni*), a federally threatened species and California species of special concern, historically ranged from Marin County southward to northern Baja California. This species is still locally abundant in portions of the San Francisco Bay area and along the Central Coast. Only isolated populations of California red-legged frog (CRLF) have been documented in the Sierra Nevada foothills region. Remaining aggregations in the foothills have become fragmented and nearly extirpated due to a variety of factors, including habitat loss, expansions of exotic predators, and habitat fragmentation (Salix 2012).

CRLF prefers aquatic habitats with little or no flow, the presence of surface water to at least early June, surface water depths to at least 0.7 meters (2.3 feet), and the presence of fairly sturdy underwater supports such as cattails. The largest densities of this subspecies are typically associated with dense stands of overhanging willows and an intermixed fringe of sturdy emergent vegetation (Salix 2012). CRLF typically breed from January to July, with peak breeding occurring in February. Eggs are attached to subsurface vegetation, and hatched tadpoles require 11 to 20 weeks to metamorphose.

There are currently no documented occurrences of CRLF within the broader project region (Salix 2012). The closest documented occurrences of CRLF are from Tehama County (occurrence no. 121) in 1986. This occurrence is from approximately 24 miles west of Red Bluff along Sunflower Gulch. Other documented occurrences to the south of the project region are from Butte County in the Plumas and Lassen national forests. During previous surveys, no suitable aquatic habitat for CRLF, consisting of permanent streams or pools with adjacent riparian cover, was observed within the project site. Based on the absence of suitable aquatic habitat and the absence of documented occurrences in the broader project region, this species is not expected to occur within the Mountain Gate at Shasta project site.

Foothill yellow-legged frog (*Rana boylei*) is found in partially shaded, shallow rocky streams in a variety of habitats throughout the foothills of the Sierra Nevada. This species is rarely found far from permanent water. Adults often bask on exposed rocks near streams and dive into the water to take refuge beneath rocks when disturbed. Typical diet consists of both aquatic and terrestrial invertebrates. Breeding commences from mid-March to May, depending on local water conditions. Eggs are deposited in clusters and attached to gravel or rocks in moving water near stream margins. Eggs hatch in about 5 days. Tadpoles reach a size of about 2 inches and transform in approximately 3 to 4 months. For aquatic habitats to be considered suitable, surface water must be present in scattered locations for at least 15 weeks to allow for metamorphosis (Salix 2012).

The CNDDDB documents numerous occurrences of foothill yellow-legged frog (FYLF) in the broader project region. However, most of the occurrences are from the north along perennial rocky streams associated with Shasta Lake. No suitable aquatic habitat for FYLF, including perennial or near-perennial streams, was observed within the Area Plan. Intermittent and ephemeral creeks observed throughout the site are known to be dry during the summer months of most years. FYLF prefers shallow, rocky, partly shaded streams with perennial surface flow. Although some of the intermittent streams within the project site may retain small pockets of

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surface water into the summer months, occurrence of FYLF is considered unlikely due to the marginal quality of habitat available.

Western pond turtle (*Emys marmorata*), a California species of special concern, occurs in association with streams, rivers, and ponds containing suitable cover and basking sites. This subspecies can be associated with both permanent and ephemeral water sources, including perennial and intermittent streams. Suitable basking sites along streams or ponds include partially submerged logs, rocks, mats of floating vegetation, or open streambanks. Suitable upland habitat, such as sandy banks or grassy fields, located adjacent to the aquatic habitat is required for egg-laying. Nesting may take place in a variety of soil types from loose sandy soils to compact soils, and in a variety of habitat types. Eggs are laid from March to August, depending on local climate and water conditions, and incubation occurs for 73 to 80 days (Salix 2012).

Potential habitat for western pond turtle is unlikely within the project site due to the absence of perennial ponds or slow-moving sections of streams. Streams and associated pools throughout the site are not expected to retain surface water throughout the dry months during most years. The only areas that have potential to support pond turtles on a periodic basis are the lowermost reaches of Moody Creek in areas that retain surface water for longer durations.

Purple martin (*Progne subis*) is an uncommon to rare, local summer resident in low-elevation woodlands of California (Salix 2012). They occur in a variety of woodlands, including oak woodland and riparian communities, as well as in low-elevation coniferous forests. Nesting usually takes place in tall, old trees or snags located near water. Nests are constructed in old woodpecker cavities, but are occasionally constructed in man-made structures such as culverts or under bridges. Purple martins arrive from South America in late March. Breeding then takes place from April to August, with peak activity in June. Depending on site availability, purple martins will sometimes nest colonially. Young of this species fledge at approximately 24 to 31 days (Salix 2012).

The CNDDDB documents four somewhat recent occurrences of purple martin in the region surrounding the project site. All of the occurrences are associated with blue oak-foothill pine woodland near Shasta Lake. The project site contains marginal quality nesting habitat in the form of oak woodland with scattered snags. Based on the proximity to other somewhat recently documented nesting activity in 2007 and the presence of suitable habitat, it is expected that purple martin has a reasonable potential for nesting on-site.

4.6.2 REGULATORY FRAMEWORK

This section summarizes the federal and state regulations that protect special-status species, waters of the US, and wetland habitats. This section also discusses pertinent City of Shasta Lake plans, ordinances, and policies relating to the protection and preservation of biological resources.

FEDERAL

Endangered Species Act

The federal Endangered Species Act (ESA) generally prohibits the “taking” of a species listed as endangered or threatened (16 USC 1532, 50 CFR 17.3). Under the ESA, the “take” of a threatened or endangered species is deemed to occur when an intentional or negligent act or omission results in any of the following actions: “to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct.” The term “harm”

includes acts that result in death or injury to wildlife. Such acts may include significant habitat modification or degradation if it results in death or injury to wildlife by significantly impairing essential behavioral patterns, including breeding, feeding, or sheltering. For projects with a federal nexus, Section 7 of the ESA requires that federal agencies, in consultation with the USFWS or NOAA Fisheries, use their authorities to further the purpose of the ESA and to ensure that their actions are not likely to jeopardize the continued existence of listed species or result in destruction or adverse modification of critical habitat. Section 10(a)(1)(B) allows non-federal entities to obtain permits for incidental taking of threatened or endangered species through consultation with the USFWS or NOAA Fisheries.

Critical habitat is defined in Section 3(5)(A) of the ESA as “(i) the specific areas within the geographical area occupied by a species, at the time it is listed in accordance with the ESA, on which are found those physical or biological features (I) essential to the conservation of the species and (II) that may require special management considerations or protection; and (ii) specific areas outside the geographical area occupied by a species at the time it is listed, upon a determination that such areas are essential for the conservation of the species.”

Section 3(3) of the ESA defines “conservation” as “to use and the use of all methods and procedures which are necessary to bring an endangered species or threatened species to the point at which the measures provided pursuant to the ESA are no longer necessary” (i.e., the species is recovered and removed from the list of endangered and threatened species). The designation of critical habitat directly affects only federal agencies, by prohibiting actions they fund, authorize, or carry out from destroying or adversely modifying critical habitat. Individuals, businesses, and other non-federal entities are not affected by the designation of critical habitat so long as their actions do not require a permit, a license, funding, or other support from a federal agency.

Migratory Bird Treaty Act

Migratory birds are protected under the federal Migratory Bird Treaty Act (MBTA) of 1918 (16 USC 703–711). The MBTA makes it unlawful to take, possess, buy, sell, purchase, or barter any migratory bird listed in 50 CFR Part 10, including feathers or other parts, nests, eggs, or products, except as allowed by implementing regulations (50 CFR 21). The MBTA is administered by the USFWS, and special permits from the agency are generally required for the take of any migratory birds.

STATE

California Endangered Species Act

Under the California Endangered Species Act (CESA), The CDFW has the responsibility for maintaining a list of endangered and threatened species (California Fish and Game Code Section 2070). The CDFW also maintains a list of “candidate species,” which are species that the CDFW formally notices as being under review for addition to the list of endangered or threatened species. In addition, the CDFW maintains lists of “species of special concern,” which serve as species “watch lists.” Pursuant to the requirements of the CESA, an agency reviewing a proposed project within its jurisdiction must determine whether any state-listed endangered or threatened species may be present in the project study area and, if so, whether the proposed project would have a potentially significant impact on any of these species. In addition, the CDFW encourages informal consultation on any proposed project that may affect a species that is a candidate for state listing. “Take” of protected species incidental to otherwise lawful

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management activities may be authorized under Section 2081 of the Fish and Game Code of California. Authorization from the CDFW would be in the form of an Incidental Take Permit.

California Native Plant Protection Act

The California Native Plant Protection Act (California Fish and Game Code Sections 1900–1913) prohibits the taking, possessing, or sale within the state of any plants with a state designation of rare, threatened, or endangered, as defined by the CDFW. An exception to this prohibition allows landowners, under specified circumstances, to take listed plant species, provided that the owners first notify the CDFW and give the agency at least 10 days to retrieve (and presumably replant) the plants before they are plowed under or otherwise destroyed. Fish and Game Code Section 1913 exempts from the “take” prohibition “the removal of endangered or rare native plants from a canal, lateral ditch, building site, or road, or other right of way.”

California Fish and Game Code

Raptor species (birds of prey) are protected from “take” according to California Fish and Game Code Section 3503.5. Section 3503.5 states that it is “unlawful to take, possess, or destroy any birds in the order Falconiformes or Strigiformes or to take, possess, or destroy the nest or eggs of any such bird except as otherwise provided by this code or any regulation adopted pursuant thereto.” Disturbance that causes nest abandonment and/or loss of reproductive effort is considered “taking” by the CDFW.

California statutes also accord “fully protected” status to a number of specifically identified birds, mammals, reptiles, amphibians, and fish. These species cannot be “taken,” even with an incidental take permit (California Fish and Game Code Sections 3505, 3511, 4700, 5050, and 5515).

CEQA Guidelines Section 15380

Although threatened and endangered species are protected by specific federal and state statutes, California Environmental Quality Act (CEQA) Guidelines Section 15380(d) provides that a species not listed on the federal or state list of protected species may be considered rare or endangered if the species can be shown to meet certain specified criteria. These criteria have been modeled after the definition in the ESA and the section of the California Fish and Game Code dealing with rare or endangered plants and animals. Section 15380(d) allows a public agency to undertake a review to determine if a significant effect on species that have not yet been listed by either the USFWS or the CDFW (e.g., candidate species, species of concern) would occur. Thus, CEQA provides an agency with the ability to protect a species from a project’s potential impacts until the respective government agencies have an opportunity to designate the species as protected, if warranted.

REGULATION OF ACTIVITIES IN WATERS OF THE US AND WETLANDS

Federal Regulation

The US Army Corps of Engineers (USACE) has primary federal responsibility for administering regulations that concern waters of the United States, including jurisdictional wetlands. The USACE acts under two statutory authorities, the Rivers and Harbors Act (Sections 9 and 10) which governs specified activities in navigable waters of the US, and the Clean Water Act (Section 404), which governs specified activities in other waters of the US and many wetland habitats. The USACE requires that a permit be obtained if a project proposes placing structures within, over, or

under navigable waters and/or discharging dredged or fill material into waters of the US below the ordinary high water mark in non-tidal waters. The Environmental Protection Agency (EPA), the USFWS, the National Marine Fisheries Services (NMFS), and several other agencies provide comment on USACE permit applications. On agricultural lands, the Natural Resources Conservation Service (NRCS) is the primary federal agency charged with determining the boundary of jurisdictional wetlands for implementation of the Food Securities Act; however, the USACE retains primary permitting authority.

State Regulation

The state's authority in regulating activities in waters of the US and wetlands resides primarily with the CDFW and the State Water Resources Control Board (SWRCB). The CDFW provides comment on USACE permit actions under the Fish and Wildlife Coordination Act. The CDFW is also authorized under the California Fish and Game Code to develop mitigation measures and enter into Streambed Alteration Agreements with applicants who propose projects that would obstruct the flow of or alter the bed, channel, or bank of a river or stream in which there is a fish or wildlife resource, including intermittent and ephemeral streams. The SWRCB, acting through the Regional Water Quality Control Board (RWQCB), must certify that a USACE permit action meets state water quality objectives. The RWQCB also regulates the discharge of dredged or fill material into drainages and wetlands that are not subject to USACE jurisdiction (e.g., isolated waters).

LOCAL

City of Shasta Lake General Plan

The City of Shasta Lake General Plan identifies specific policies regarding biological resources. **Table 4.6-3** analyzes the project's consistency with City of Shasta Lake General Plan policies. While this Draft EIR analyzes the project's consistency with the General Plan pursuant to CEQA Section 15125(d), it is the City of Shasta Lake Planning Commission and/or City Council that will make the determination of the project's consistency with the identified General Plan policies.

TABLE 4.6-3
PROJECT CONSISTENCY WITH CITY OF SHASTA LAKE
GENERAL PLAN: BIOLOGICAL RESOURCES

General Plan Objectives & Policies	Consistent with General Plan?	Analysis
OSR-3 Establish, integrate, and maintain "natural" and "man-made" greenbelt areas along existing creeks, floodplains, natural open space areas, certain roadways, bike and trail systems.	Yes	The Mountain Gate at Shasta Area Plan contains Policy 3.5, Parks, Open Space and Trails, that requires that "no development shall occur within designated wetland and open space areas unless reviewed by the City and evaluated for potential impacts."
OSR-b The significant creek and streamside corridors in the City of Shasta Lake shall be designated on the General Plan Maps. The primary purpose of this designation is to protect the riparian habitats from development. The purpose is also to encourage open space and recreation. Riparian habitat protection along the	Yes	Two creek corridors exist within the project site: Rancheria Creek and Moody Creek. The design of the site has been modified to avoid or minimize the impact to these creeks. The site does not support anadromous fish habitat.

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General Plan Objectives & Policies	Consistent with General Plan?	Analysis
significant river and creekside corridors as designated on the plan maps shall be achieved, where appropriate. The following measures are identified to provide the riparian habitat protection: Regulation of vegetation removal Design of grading and road construction Establishment of a development setback The siting of structures, including clustering.		
FW-1 Conserve and manage significant fish, wildlife and vegetation resources.	Yes	The wetland and stream corridors are protected through avoidance and mitigation as part of the proposed project.
FW-2 Recognize that wildlife habitat and development practices may on occasion conflict and shall need to be resolved according to policies specified in the General Plan.	Yes	The proposed project will need to obtain a wetland fill permit from the USACE to allow crossing of the drainages by the roadways serving the project.
FW-b Projects that may impact rare, threatened or endangered plant or animal species, as officially designated by federal and state resource agencies, shall be designed or conditioned to avoid significant adverse impacts on those species.	Yes With Mitigation	A biological assessment and wetland delineation were prepared for the project site by North Fork Associates and are included as Appendices 4.6-1 and 4.6-2 of this DEIR. Mitigation measures MM 4.6.1a through MM 4.6.1c have been implemented to protect nesting special-status birds, raptors, and migratory birds. Mitigation measures MM 4.6.2a through MM 4.6.2c have been implemented to protect the valley elderberry longhorn beetle (VELB).
FW-(1) Prepare a Best Practices Manual, including general development standards and resources management guidelines for all sensitive habitats found in the City. Standards and guidelines should be developed for the following habitat types: oak woodlands, riparian woodlands, vernal pools, emergent wetlands, riverine habitats and open water.	Yes With Mitigation	The proposed project will apply best management practices (BMP) for all grading and construction. The proposed project will also comply with the City of Shasta Lake tree conservation ordinance. See discussion for Impact 4.6.7.
FW-(2) Ensure that open space corridors along creeks include protective buffers (non-development setbacks), preserve existing riparian vegetation through the environmental review process and require minimum setbacks from the top-of-bank along creeks. Specific setbacks and widths will be determined on a case by case basis. Input from resource agencies, including the Department of Fish and Game will be considered in determining the setback distance.	Yes	Development of the proposed project is anticipated to be located primarily outside of the wetland features. A number of stream crossings are proposed.
FW-(4) Ensure that all new development restrict the use of fencing in locations essential for	Yes	The project site is not located within a known migratory corridor of any CDFW-designated

General Plan Objectives & Policies	Consistent with General Plan?	Analysis
wildlife movement and place structures so as to minimize interference with wildlife movement.		species. The project site is located next to an urban area adjacent to and to the north and Interstate 5. See discussion for Impact 4.6.6.
FW-(10) Coordinate with the Shasta County Mosquito Abatement District to ensure that acceptable disease vector control measures are coordinated with preservation of resources such as wetlands, recognizing the community's interest in meeting federal and state wetlands protection policies.	Yes With Mitigation	See discussion above and discussion for Impact 4.6.3.
FW-(11) Coordinate with the Department of Fish and Game to ensure the preservation and enhancement of species of resident and anadromous fish in creeks within the City.	Yes	The site does not support anadromous fish habitat. See discussion for Impact 4.6.6.

City of Shasta Lake Municipal Code

Tree Conservation Ordinance

The City of Shasta Lake adopted Ordinance 04-165 with the intent to promote the conservation of a healthy tree population and to maintain and enhance tree canopy throughout the community. According to Section 12.36.010(C) of the City's Municipal Code, this is to be accomplished through (1) the preservation of existing native and nonnative trees where feasible; (2) the replacement or transplanting of trees removed where appropriate; and (3) the planting of new trees in locations, number, and kind compatible with local conditions. The ordinance pertains to all projects that are likely to result in the removal of protected trees except as noted under "exemptions."

Subdivision and Other Development Projects

The City of Shasta Lake requires that subdivisions and other development projects be designed to minimize destruction or damage to "protected trees." Section 12.36.030 of the Municipal Code defines a protected tree as (1) any living tree, except gray pine (*Pinus sabiniana*), having at least one trunk of 10 inches or more diameter at breast height; or (2) a tree that is required to be preserved under discretionary project approval or under a site development tree plan that is approved administratively by the director.

To achieve the goal of preservation, the Planning Commission may consider tree preservation as adequate grounds to approve variances associated with building setbacks, building separations, parking requirements, and driveway grades if the Commission determines that (1) the preservation and retention of a protected tree outweighs the disadvantages associated with any variance granted to save it and (2) there is a real expectation that the tree will survive for more than five years (Ordinance 04-165 Section 1 (part)).

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4.6.3 IMPACTS AND MITIGATION MEASURES

STANDARDS OF SIGNIFICANCE

Significance criteria used to analyze potential impacts on biological resources as a result of development associated with the Mountain Gate at Shasta Area Plan include factual and scientific information as well as regulatory standards of federal, state, and county agencies, including the CEQA Guidelines. The project will have a significant effect on the environment if it results in any of the following:

- 1) Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies or regulations, or by the California Department of Fish and Wildlife or US Fish and Wildlife Service.
- 2) Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means.
- 3) Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, or regulations or by the California Department of Fish and Wildlife or US Fish and Wildlife Service.
- 4) Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites.
- 5) Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance.
- 6) Conflict with the provisions of an adopted habitat conservation plan, natural community conservation plan, or other approved local, regional, or state habitat conservation plan.

Section 15065 of the CEQA Guidelines has the following mandatory findings of significance:

The project has the potential to: substantially degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of an endangered, rare or threatened species, or eliminate important examples of the major periods of California history or prehistory.

The proposed project site is not located within an area with an adopted Habitat conservation plan (HCP), natural community conservation plan (NCCP), or other approved local, regional, or state habitat conservation plan. As implementation of the proposed project would have no impact regarding provisions within an approved local, regional, or state habitat conservation plan, conservation plans (Standard of Significance 6) will not be further discussed in this Draft EIR.

METHODOLOGY

The assessment of impacts on biological resources resulting from the proposed Mountain Gate at Shasta Area Plan is specifically linked to the placement of permanent and temporary project

infrastructure (i.e., grading parcels, roads, sewer/water lines, staging areas, etc.) within the project area. Therefore, the assessment of direct impacts is based on the proposed Area Plan, including the schematic land use plan, which includes 221 acres of permanent open space (see **Figure 3.0-3**). Assessments of indirect impacts to biological resources are functions of the proximity of proposed project activities to biological resources. The proposed project has been evaluated for its potential to affect biological resources based on local, state, and federal agency regulations, policies, and guidelines as summarized in the Regulatory Framework subsection above. This analysis considers both direct and indirect impacts.

Direct impacts on biological resources would result from ground-disturbing activities undertaken to install or maintain project facilities and infrastructure. Direct impacts are defined as impacts that would be caused by the project and that would occur at the same time and place as the project activity from which they resulted. For example, the removal of vegetation during the grading of parcels or prior to paving of roadways would be considered a direct impact on vegetation resources.

Indirect impacts on biological resources would be caused by or result from project-related activities, including the ongoing operations of project facilities and infrastructure. Indirect impacts are defined as reasonably foreseeable impacts that would occur either later in time or at some distance from the activity from which they resulted. Examples of indirect impacts include the effects of artificial lighting on the behavior of nocturnal species and the effects of alteration of water quality on waters of the United States and/or wetlands and aquatic plants, fish, and wildlife.

Off-Site Improvements

The proposed Area Plan contains 369 acres of potential development (includes 27.9 acres of parkland) and 221 acres of open space that would not be directly affected by development. In addition, the City of Shasta Lake's Master Water Plan states that a 1.0-million-gallon reservoir with a maximum water surface elevation of about 1,010 feet needs to be constructed to ensure adequate water supply for the northerly two-thirds of the proposed Mountain Gate project. The new reservoir (1.0 million gallons) is shown in the Master Water Plan approximately 1,400 feet northwest of the project boundary (APN 307-200-018); however, an alternative site for this reservoir is shown on **Figure 4.10-1** within the project boundaries. An on-site booster pump station will also be required.

To provide water to the reservoir, the project will also require the installation of a new 16-inch water main within Black Canyon Drive. A wetland delineation for the reservoir site was conducted by Salix Consulting in 2013. According to the wetland delineation, the reservoir site consists of highly degraded habitat with formerly developed parcels and roads with annual grassland and foothill woodland. Due to the predominance of non-native, invasive species associated with the existing grassland community and the commonality of this plant community in the project vicinity and throughout Shasta County, loss of non-native annual grassland habitat is considered less than significant. As discussed in further detail in subsection 4.6.4, Cumulative Setting, Impacts, and Mitigation Measures, any and all impacts to foothill woodland as a result of this project and subsequent approvals will be subject to the City of Shasta Lake Tree Conservation Ordinance, which is located in Chapter 12.36 of the City Municipal Code.

Further, the wetland delineation indicates that two potentially jurisdictional wetland features were mapped on this reservoir site: .06 acres of intermittent stream and .22 acres of drainage ditches. In total, 0.28 acres of potential waters of the United States are located on the site. In addition to the USACE permits, the crossing of streams and drainages will require a permit from

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the California Department of Fish and Wildlife. A streambed alteration permit typically requires mitigation for impacts associated with both the drainage or stream channel and the riparian areas affected by the crossing. The permit may also restrict construction periods, or require extensive dewatering plans, to protect water quality in the stream or drainage. In addition, any impacts to jurisdictional waters as a result of the off-site reservoir improvement will be subject to mitigation measures **MM 4.6.3a** and **MM 4.6.3b** below.

Furthermore, a roadway connection will be required to connect Cascade Boulevard with the proposed project. The roadway would extend around a redevelopment site owned by the City of Shasta Lake. Access to the south end of the project site is proposed via an intersection of the main project road with Cascade Boulevard. The project may include an alternate access route via the northeasterly extension of Black Canyon Road, which would connect to the internal project roadway. Extension of water and wastewater collection systems to the site would be required and would involve off-site work in Shasta Dam Boulevard and the new roadway extending from the Boulevard onto the project site. A wetland delineation for this property was completed by Salix in October 2013 and is included as **Appendix 4.6-4**.

According to information provided by the City of Shasta Lake, the project will require a new substation converting 115 kilovolts (kV) to 12 kV to properly service the development. This station would require the dedication of 2 acres on the west side of the development. The City of Shasta Lake proposes to build a looped 115 kV line up the railroad right-of-way and into the station. All distribution lines at 12 kV would be undergrounded. Similar to the water reservoir, the precise location of the new substation or route of underground distribution lines has not yet been identified and would most likely be positioned in consideration of the specific future land uses developed under the proposed Area Plan. The project design does not currently include proposed lotting for future development. The project applicant would be required to submit tentative subdivision maps for future development of areas in Phase 1 through Phase III, as well as account for the location of the substation, for City consideration. This would be subject to future environmental review for project-level details in addition to the analysis provided in this Draft EIR.

IMPACTS AND MITIGATION MEASURES

Have a Substantial Adverse Effect on Any Special-Status Birds, Raptors, and Migratory Birds (Standard of Significance 1)

Impact 4.6.1 Development of the proposed project could result in adverse impacts to nesting special-status birds, raptors, and migratory birds. Impacts to these species are considered to be potentially significant.

The proposed project site contains suitable nesting habitat for migratory birds and raptors. The proposed project would result in the removal of vegetation that provides suitable nesting habitat. Removal of this vegetation during the nesting season (approximately March to September) has a potential to adversely impact these species. In addition, construction activities (e.g., noise, vibration, human presence) in the vicinity of active nest sites may adversely affect nesting activity. Special-status birds are designated by the USFWS and/or the CDFW as species of special concern, nesting raptor species as protected from take by the California Fish and Game Code, and nesting migratory birds are protected by the federal Migratory Bird Treaty Act. Impacts to active nests of special-status birds, raptors, and migratory birds would be **potentially significant**.

Mitigation Measures

MM 4.6.1a To the extent practicable, removal of vegetation, grading, and other construction activities shall be initiated outside of the nesting season (i.e., initiated from October through February).

Timing/Implementation: Prior to initiating construction of each subsequent development allowed under the Area Plan

Enforcement/Monitoring: City of Shasta Lake Development Services Department

MM 4.6.1b In areas where suitable raptor nesting habitat (e.g., large trees) will be removed during the nesting season (approximately September through February) or where construction activities will occur within 500 feet of suitable raptor nesting habitat or within 660 feet of suitable bald eagle nesting habitat during the nesting season, a qualified biologist shall conduct preconstruction surveys for nesting raptors and bald eagles. At least one survey shall be conducted no more than two weeks prior to the anticipated onset of construction activity at each phase of development, and all surveys shall cover a minimum 660-foot buffer around the proposed construction zones. If vegetation removal or other construction activities are delayed or suspended for more than two weeks after the preconstruction survey, the site shall be resurveyed. If no active raptor or bald eagle nests are identified, no further measures are necessary. If active raptor nests are identified within the 500-foot buffer, or active bald eagle nests are identified within the 660-foot buffer, the following measures shall be implemented:

1. If feasible, avoid construction activities within 500 feet of active raptor nests and 660 feet of active bald eagle nests until nesting activity has ceased, as determined by a qualified biologist.
2. If avoidance of all construction activities within 500 feet of active raptor nests and/or 660 feet of active bald eagle nests is not feasible, a qualified biologist, in consultation with the CDFW, shall identify measures necessary to avoid "take" of active nests. These measures shall include, but are not limited to, maintaining a minimum distance from active nesting sites and monitoring by a qualified biologist. The monitoring biologist shall have authority to stop any work determined to be adversely affecting nesting activity. The monitoring biologist shall report any "take" of active raptor nests to the CDFW.

Timing/Implementation: Prior to issuance of a grading permit for each subsequent development allowed under the Area Plan

Enforcement/Monitoring: City of Shasta Lake Development Services Department

MM 4.6.1c In areas where suitable nesting habitat for migratory birds, such as purple martins, will be removed during the nesting season (approximately March to

4.6 BIOLOGICAL RESOURCES

September), a qualified biologist shall conduct preconstruction surveys for active nest sites. At least one survey shall be conducted no more than two weeks prior to the anticipated onset of construction activity. Surveys shall cover all areas where suitable nesting habitat will be removed, as well as the surrounding 250-foot buffer area. If vegetation removal activities are delayed or suspended for more than two weeks after the preconstruction survey, the site shall be resurveyed. If no active nests are identified, no further measures are necessary. If an active nest is found during the preconstruction survey, a 250-foot buffer shall be established around the nesting site to avoid inadvertent disturbance of the nest and potential abandonment. The nesting site and buffer shall remain undisturbed until after the young have fledged. The width of the buffer should be determined by the biologist in coordination with the CDFW and would be dependent on the types of activities planned in the vicinity of the nest.

Timing/Implementation: *Prior to issuance of a grading permit for each subsequent development allowed under the Area Plan*

Enforcement/Monitoring: *City of Shasta Lake Development Services Department*

Implementation of mitigation measures **MM 4.6.1a** through **MM 4.6.1c** will reduce impacts to a **less than significant** level.

Have a Substantial Adverse Effect on the Valley Elderberry Longhorn Beetle (Standard of Significance 1)

Impact 4.6.2 Direct disturbance (e.g., removal, trimming) to elderberry shrubs or activities within 100 feet of elderberry shrubs could result in adverse impacts to valley elderberry longhorn beetle (VELB), if this species is present. Loss of individuals or potentially suitable habitat for this species is considered to be a potentially significant.

While no elderberry shrubs were identified during field surveys of the proposed project site, the presence or absence of elderberry shrubs could not be conclusively determined due to dense vegetative cover in woodland areas, particularly in the southern portion of the site. To identify the presence of potentially suitable habitat for VELB that may occur in dense woodland areas of the site, preconstruction surveys for elderberries should be conducted prior to any ground disturbance in these areas. All elderberries with stems at ground level greater than 1 inch diameter are considered potentially suitable habitat for VELB and are protected by the federal Endangered Species Act. Impacts to these shrubs would require a take permit from the United States Fish and Wildlife Service. Loss of individuals or potentially suitable habitat for this species is considered to be a **potentially significant** impact.

Mitigation Measures

MM 4.6.2a Preconstruction surveys for elderberry shrubs shall be conducted by a qualified biologist. If no elderberry shrubs are located, no further measures are necessary.

Timing/Implementation: Prior to issuance of a grading permit for each subsequent development allowed under the Area Plan

Enforcement/Monitoring: City of Shasta Lake Development Services Department

MM 4.6.2b If practicable, construction activities shall be avoided within 100 feet of any identified elderberry shrubs, and fencing or signage shall be provided as necessary to keep people and equipment outside of the 100-foot buffer throughout construction. Provide for the preservation of the elderberry shrubs and maintenance of the 100-foot buffer throughout the life of the project.

Timing/Implementation: Prior to issuance of a grading permit for each subsequent development within 100 feet of elderberry shrubs

Enforcement/Monitoring: City of Shasta Lake Development Services Department

MM 4.6.2c If avoidance of the elderberry shrubs and 100-foot buffer is not practicable, a USFWS protocol-level survey for valley elderberry longhorn beetles shall be conducted by a qualified biologist. If no evidence of the presence of the species is detected during the survey, and in the professional opinion of the biologist, valley elderberry longhorn beetles are not likely to occur within the proposed project site, the USFWS shall be contacted with a request for concurrence with a “no effect” or “not likely to adversely effect” determination. If the USFWS concurs that the project will not affect valley elderberry longhorn beetles, no further measures are required. If evidence of the species is detected during the protocol-level survey or the USFWS will not concur with a “no effect” or “not likely to adversely effect” determination:

1. Formal consultation with the USFWS shall be initiated under Section 7 or Section 10 of the Endangered Species Act, as appropriate. No activities shall occur within 100 feet of the elderberry shrubs until Incidental Take authorization has been obtained from the USFWS.

Timing/Implementation: Prior to issuance of a grading permit for each subsequent development within 100 feet of elderberry shrubs

Enforcement/Monitoring: City of Shasta Lake Development Services Department

Implementation of mitigation measures **MM 4.6.2a** through **MM 4.6.2c** will reduce impacts to a **less than significant** level.

Have a Substantial Adverse Effect on Waters of the United States, Including Wetlands (Standard of Significance 2)

Impact 4.6.3 Development of the proposed project could result in impacts to waters of the US, including wetland habitats. This impact is potentially significant.

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Based on the results of the preliminary delineation, approximately 57.82 acres of waters of the United States, including wetlands, occur within the proposed project site and property to the south that will accommodate the roadway extension to Cascade Boulevard. This includes approximately 0.71 acres of ephemeral streams and 8.43 acres of intermittent streams. Development associated with the proposed project is anticipated to locate primarily outside of the wetland features, which would avoid direct impacts to most waters of the US occurring within the site. The project will preserve approximately 46.16 acres of waters of the US. However, a number of stream crossings are proposed, and final site plans have not been developed to verify whether full avoidance can be attained. Future development within the Mountain Gate at Shasta Area Plan, including construction of associated infrastructure such as roads and utility lines, could result in the discharge of fill material into jurisdictional waters. Impacts to waters of the US, including wetlands, would be **potentially significant**.

In addition to the USACE permits, the crossing of streams and drainages will require a permit from the California Department of Fish and Wildlife. The streambed alteration permit typically requires mitigation for impacts associated with both the drainage or stream channel and the riparian areas affected by the crossing. The permit may also restrict construction periods or require extensive dewatering plans to protect water quality in the stream or drainage. As each crossing is unique, the terms of the permit may also change, depending on location.

Mitigation Measures

MM 4.6.3a A delineation of waters of the United States, including wetlands, shall be submitted to and verified by the USACE.

Timing/Implementation: Prior to issuance of a grading permit

Enforcement/Monitoring: City of Shasta Lake Development Services Department

MM 4.6.3b Authorization under a Nationwide Permit or Individual Permit shall be obtained from the USACE. For fill requiring a USACE permit, water quality certification shall be obtained from the RWQCB prior to discharge of dredged or fill material. All mitigation required by USACE shall be satisfied, including any replacement requirement at a ratio intended to fulfill the no net loss policy.

Prior to any activities that would obstruct the flow of, or alter the bed, channel, or bank of any intermittent or ephemeral creeks, notification of streambed alteration shall be submitted to the CDFW; and, if required, a streambed alteration agreement shall be obtained

Timing/Implementation: Prior to issuance of a grading permit

Enforcement/Monitoring: City of Shasta Lake Development Services Department

Implementation of mitigation measures **MM 4.6.3a** and **MM 4.6.3b** will reduce impacts to a **less than significant** level.

Have a Substantial Adverse Effect on Any Sensitive Natural Community – Oak Woodland Habitat and Annual Grassland (Standard of Significance 3)

Impact 4.6.4 Development of the proposed project would result in the reduction of oak woodland habitat and loss of annual grassland. This is considered a **significant** impact.

The construction of infrastructure associated with the Mountain Gate at Shasta Area Plan will result in loss of annual grassland and a reduction of oak woodland habitat.

Due to the predominance of non-native, invasive species associated with the existing grassland community and the commonality of this plant community in the project vicinity and throughout Shasta County, loss of non-native annual grassland habitat is considered less than significant.

According to the tree study prepared for the proposed Area Plan (Sharrah Dunlap Sawyer 2011), 617 oak trees measuring 10 inches diameter at breast height (DBH) and greater would be removed to accommodate roadways within the boundaries of the Area Plan. Oak trees are protected under the City of Shasta Lake Tree Conservation Ordinance, which is located in Chapter 12.36 of the City Municipal Code. The tree ordinance requires replacement trees to be replanted to compensate for the loss of a protected tree. Consistent with the intent of the ordinance, three 15-gallon trees will be planted for each protected tree removed that exceeds 10 inches DBH. In total, 1,851 trees will be planted to compensate for the loss of oak trees in connection with the Tentative Subdivision Map, which amounts to a net gain of 1,234 trees. Accordingly, as it relates to the Tentative Subdivision Map, compliance with the Tree Conservation Ordinance will result in a sufficient number of replanted trees to compensate for the loss and thus will reduce potential impacts to oak woodlands to a less than significant level.

As the project site is further subdivided, additional protected trees will necessarily be removed. The nature and extent of future tree removal as a result of subsequent entitlements is unknown at this time. Subsequent entitlements, however, will be required to undergo separate CEQA review and will further be subject to the tree ordinance's restrictions and planting standards. Because each subsequent entitlement will undergo separate CEQA review specific to those entitlements, the oak tree impacts associated with subsequent entitlements are not subject to evaluation or mitigation in this Draft EIR. It should be noted, however, that future development will be required to comply with the tree ordinance's minimum planting standards, unless the City at that time allows for a different tree-planting requirement consistent with the intent of the ordinance. The tree ordinance's minimum planting standards are as follows:

- Three 15-gallon oak trees shall be planted for each proposed single-family unit/lot and two 15-gallon trees for each multi-family unit.
- Two 15-gallon oak trees shall be planted for each 1,000 square feet of gross floor area or covered space.
- In addition to the tree planting standards set forth above, three 15-gallon oak trees shall be planted for each protected tree removed that exceeds 10 inches DBH.

In addition to the minimum planting standards listed above, future development will also be required to comply with the requirements in the Area Plan, which include the following tree replacement planting and preservation requirements:

4.6 BIOLOGICAL RESOURCES

- All future roadways within parcels A–U shall incorporate street trees and a setback sidewalk design. Street trees shall be planted 30 feet on center where feasible within the landscaped parkways taking into account necessary setbacks from fire hydrants, intersections, driveways, etc.
- All protected trees shall remain within parcels B, T, and U (open space) except where those trees interfere with utility extensions or other improvements required as part of the Mountain Gate development.
- Protected trees shall remain within parcels C and K (park areas) to the extent feasible, and additional 15-gallon trees shall be planted as part of the park improvements.
- Single-family parcels within parcels F, Q, and S (very low density residential) shall have two additional 15-gallon trees planted per parcel.
- Pavement and base from the southern terminus of the existing Wonderland Boulevard (south of proposed parcel A) shall be removed; a tree mitigation planting area shall be created and shall be vegetated with small rooted stock.
- Plant 15-gallon trees approximately 50 feet on center adjacent to the pedestrian trails (in non-forested areas) within the open space corridors.

Mitigation Measures

MM 4.6.4 Three 15-gallon trees shall be planted for each protected tree removed that exceeds 10 inches DBH, in compliance with the City's Tree Conservation Ordinance. A tree replacement plan shall be submitted showing the number, location and type of trees to be planted.

Timing/Implementation: Prior to final completion of the large-lot circulation plan improvements

Enforcement/Monitoring: City of Shasta Lake Development Services Department

Implementation of mitigation measure **MM 4.6.4** will reduce impacts to oak woodlands to a **less than significant** level.

Interfere Substantially with or Result in the Loss of Breeding and Foraging Habitat (Standard of Significance 4)

Impact 4.6.5 Development of the proposed project would result in the loss of breeding and foraging habitat for common and special-status wildlife species and may result in indirect impacts to these species. This impact is considered to be **potentially significant**.

The proposed project would result in development of the majority of the approximately 590-acre site. The site primarily comprises oak woodland habitat and annual grassland. These habitat types provide resources for common and special-status wildlife species. Special-status species that may use oak woodland for breeding include raptors. Species-status species that would not breed on the site, but may forage or utilize the site occasionally, include golden eagle, northern

harrier, American peregrine falcon, sharp-shinned hawk, white-tailed kite, and Pacific western big-eared bat. Several common wildlife species may use the habitat types for foraging, breeding, and shelter.

Mitigation for active breeding by special-status species is addressed above in Impacts 4.6.1, 4.6.2, and 4.6.3. Given the regional abundance of the upland habitat types occurring within the proposed project site, the relatively small reduction in wildlife habitat is considered to be less than significant.

Indirect impacts resulting from human disturbance during project construction or maintenance could include displacement of some special-status and common wildlife species to other habitats, which may or may not be able to support additional individuals. Indirect impacts resulting from increased human disturbance may also include avoidance of preferred habitat. However, given the regional abundance of the habitat types found within the proposed project site, these impacts are considered to be less than significant.

Lighting along the roadways could adversely affect both special-status and common wildlife species, disrupting biological rhythms and otherwise interfering with the behavior of nocturnal animals. This impact would be **potentially significant**.

Mitigation Measures

MM 4.6.5 Streetlights shall be shielded and directed downward to the street, away from open space areas to the extent practicable. Implementation of mitigation measures MM 4.12.5a through MM 4.12.5c for additional mitigation to reduce nighttime lighting impacts has been included (see Section 4.12, Aesthetics/ Visual Resources/Light and Glare, of this Draft EIR).

Timing/Implementation: Prior to improvement plan approval

Enforcement/Monitoring: City of Shasta Lake Development Services Department

Implementation of mitigation measure **MM 4.6.5** will reduce impacts to a **less than significant** level.

Interfere Substantially with Migratory Wildlife Corridors (Standard of Significance 4)

Impact 4.6.6 Construction associated with the proposed Mountain Gate at Shasta Area Plan could block or disrupt a major wildlife migration or a travel corridor. This is considered a **less than significant** impact.

The project site is not located within a known migratory corridor of any CDFW-designated deer herd. Additionally, the site supports no suitable anadromous fish habitat. The project site has low potential to function as a significant travel corridor for any terrestrial species because it is located adjacent to and north of an urban area and is bordered on the east by a barrier to long distance movement (i.e., Interstate 5). The preservation of riparian corridors would ensure migratory bird species would still be able to utilize the project site during migration events. Construction associated with the Mountain Gate Area Plan would have a **less than significant** impact on regional wildlife movement through the area.

4.6 BIOLOGICAL RESOURCES

Mitigation Measures

None required.

Conflict with City of Shasta Lake Tree Conservation (Standard of Significance 5)

Impact 4.6.7 Development of the proposed project could conflict with City of Shasta Lake tree conservation policies and ordinances. This is considered a **less than significant** impact.

As noted in Impact 4.6.4 above, the tree study prepared for the proposed Area Plan (Sharrah Dunlap Sawyer 2011) indicates that 617 oak trees measuring 10 inches DBH and greater would be removed as a result of the proposed circulation plan. Oak trees are protected under the City of Shasta Lake Tree Conservation Ordinance, which is located in Chapter 12.36 of the City Municipal Code. The tree ordinance requires replacement trees to be replanted to compensate for the loss of a protected tree. Consistent with the intent of the ordinance, three 15-gallon trees will be planted for each protected tree removed that exceeds 10 inches DBH. In total, 1,851 trees will be planted to compensate for the loss of oak trees in connection with the large-lot Tentative Subdivision Map, which amounts to a net gain of 1,234 trees. Accordingly, compliance with the Tree Conservation Ordinance will result in a sufficient number of replanted trees to compensate for the loss and thus will reduce potential impacts to oak woodlands to a less than significant level. Because tree replanting measures will be implemented consistent with the tree ordinance, the proposed project will not conflict with the ordinance.

As discussed in Impact 4.6.4, as the project site is further subdivided, additional protected trees will necessarily be removed. The nature and extent of future tree removal as a result of subsequent entitlements is unknown at this time. Subsequent entitlements, however, will be required to undergo separate CEQA review and will further be subject to the tree ordinance planting standards and other preservation requirements. Because each subsequent entitlement will undergo separate CEQA review, a discussion regarding the consistency of future development with the tree ordinance will not be provided in this EIR, as such discussion would be speculative at this time.

Mitigation Measures

Implementation of MM 4.6.4.

4.6.4 CUMULATIVE SETTING, IMPACTS, AND MITIGATION MEASURES

CUMULATIVE SETTING

The cumulative setting for the project is the same as described under the discussion of biological communities in the Existing Setting subsection above.

CUMULATIVE IMPACTS AND MITIGATION MEASURES

Cumulative Wetland Impacts

Impact 4.6.8 Buildout of the proposed project may affect wetland resources. This impact is **potentially cumulatively considerable**.

Development of the proposed project site will result in the loss of 11.66 acres of waters of the US. As noted in mitigation measure **MM 4.6.3b**, replacement will be required in the USACE permit at a ratio intended to fulfill the “no net loss” policy. Implementation of the USACE Section 404 permit and mitigation measures **MM 4.6.3a** and **MM 4.6.3b** would reduce project impacts to these biological resources to a **less than cumulatively considerable** level.

Mitigation Measures

Implementation of mitigation measures **MM 4.6.1a** through **MM 4.6.3** would reduce this impact to a less than cumulatively considerable level.

Cumulative Oak Woodland Impacts

Impact 4.6.9 Buildout of the proposed project will result in the loss of oak woodland habitat. This impact is **cumulatively considerable**.

While the proposed project includes a Tentative Subdivision Map, the intent of these parcels is for later subdivision consistent with the Area Plan. The resulting development would likely result in the elimination of 617 trees outside of riparian corridors and open space areas. While the individual subdivisions may be required to match grade and follow slope to the extent practical, the need to provide positive storm drainage to a public facility would result in grading of most of the parcels.

Implementation of the City's Tree Conservation Ordinance will result in new trees being planted to replace some of those lost during development, but it is unlikely that enough trees can be planted to fully replace those lost. The City does not have a tree replacement fund or other mechanism to require planting in kind off-site, but could develop one in the future and apply the fee or program to subsequent projects. Because it is unlikely that the tree replacement program implemented as part of the ordinance will result in sufficient trees to completely offset the loss, and development of a replacement program for off-site planting and maintenance of trees is speculative, this impact is considered **cumulatively considerable** and **significant and unavoidable**.

Mitigation Measures

MM 4.6.9 In addition to the minimum planting standards in the City's Tree Conservation Ordinance, future development shall be required to comply with the requirements in the Area Plan, which include the following tree replacement planting and preservation requirements:

- All future roadways within parcels A-U shall incorporate street trees and a setback sidewalk design. Street trees shall be planted 30' on-center (O.C.) where feasible within the landscaped parkways taking into account necessary setbacks from fire hydrants, intersections, driveways, etc.
- All protected trees shall remain within parcels B, T & U (open space) except where those trees interfere with utility extensions or other improvements required as part of the Mountain Gate development.

4.6 BIOLOGICAL RESOURCES

- Protected trees shall remain within parcels C & K (park areas) and additional 15-gallon trees shall be planted as part of the park improvements.
- Single family parcels within Parcel F, Q & S (very low density residential) shall have two additional 15-gallon trees planted per parcel in addition to the required three 15-gallon oak trees to be planted for each proposed single-family unit/lot and any required replacement trees.
- Pavement and base shall be removed from the southern terminus of the existing Wonderland Boulevard (south of proposed parcel A); a tree mitigation planting area shall be created and vegetated with small rooted stock.
- 15-gallon trees approximately 50' O.C., shall be planted adjacent to the pedestrian trails (in non-forested areas) within the open space corridors.

Timing/Implementation: Prior to improvement plan approval or occupancy of any residential or commercial use as applicable.

Enforcement/Monitoring: City of Shasta Lake Development Services Department

Implementation of mitigation measure **MM 4.6.9** would reduce this impact to a **less than cumulatively considerable** level.

Cumulative Heritage Tree Impacts

Impact 4.6.10 Buildout of the proposed project would result in the loss of heritage oak trees. This impact is **potentially cumulative considerable**.

Heritage oaks, those trees 35 inches DBH or greater, have been avoided by most of the proposed project and placed in open space areas or along rights-of-way. Unless carefully planned, even the preserved oaks could be in jeopardy from over-irrigation or disturbance. Mitigation measure **MM 4.6.10** addresses appropriate protection for heritage oaks. By avoiding the trees, protecting them during construction, and educating adjacent landowners about the danger of overwatering or landscaping under the trees, the longevity of the heritage oaks should not be compromised by the proposed project.

Mitigation Measures

MM 4.6.10 The following measures shall apply to construction in the vicinity of heritage oak trees:

1. Fencing shall be provided at least 6 feet outside of the dripline of all trees to be preserved. The fencing is to remain during construction.
2. No construction activities, including vehicle parking or materials stockpiling, shall occur within the fenced area.

3. No grading, cutting, or trenching shall occur within the protected area.
4. Any pruning of the tree for safety or tree health shall only be done under the supervision of a City-approved arborist.
5. Irrigation systems proposed adjacent to the trees shall be reviewed and approved by a City-approved arborist.
6. Prior to occupancy of any home or business adjacent to a heritage tree, tree maintenance information shall be provided to the City for review and comment. The maintenance information shall inform the homeowner or business owner of the importance of how to ensure the longevity of the tree. The information shall be reviewed by a City-approved arborist.

Timing/Implementation: *Prior to and during construction and prior to occupancy of any residential or commercial use as applicable.*

Enforcement/Monitoring: *City of Shasta Lake Development Services Department*

With implementation of mitigation measure **MM 4.6.10**, trees identified as heritage that will be preserved will be protected during both construction and occupancy of buildings. As mitigated, this impact is considered **less than cumulatively considerable**.

4.6 BIOLOGICAL RESOURCES

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4.7 HYDROLOGY AND WATER QUALITY

This section focuses on the local hydrology and water quality characteristics associated with the proposed project. Potential impacts of the project discussed in this section of the DEIR include surface runoff and flooding. Information presented in this section is based on field investigations and the following reports: the Preliminary Geotechnical Report prepared by CGi Technical Services, Inc. (2011) (**Appendix 4.8-1**), Geologic and Geotechnical Reconnaissance Report prepared by ENGEO Incorporated (2005) (**Appendix 4.8-2**) and a wetlands delineation by North Fork Associates (2005) (**Appendix 4.6-3**) and by Salix (2012) (**Appendix 4.6-4**). The preliminary storm drain analyses prepared by Sharrah Dunlap Sawyer are included as **Appendix 4.7.1**.

4.7.1 EXISTING SETTING

The City of Shasta Lake is situated at the far north end of the Sacramento Valley at the point where the valley meets the foothills of the Klamath and Cascade mountain ranges. Two distinctive geographic features in the area—the Shasta Dam Reservoir and the Sacramento River—create the northern and western drainage watershed boundaries for the city.

Within these watersheds, three major stream channels run through the city: Moody Creek, Salt Creek, and Churn Creek. Moody Creek and Salt Creek meander through the major urban area of the city, passing under Interstate 5 and beyond the city limits in a southeasterly direction. Churn Creek runs south of the city's major urban areas and under Oasis Road to the north end of the Redding city limits. All of these creeks eventually flow into the Sacramento River at the south end of the City of Redding. The total watershed area is approximately 9.5 square miles for Churn Creek, 3.8 square miles for Salt Creek, and 4.9 square miles for Moody Creek (see **Figure 4.7-1**).

CLIMATE AND PRECIPITATION

The climate in the northern portion of the Sacramento Valley is characterized by hot, dry summers and moderately cool, wet winters. Average annual rainfall in the city is approximately 63 inches. The city usually experiences the majority of storm events from early November through early April. Snowfall is infrequent, seldom lasting more than 24 hours. Winds are predominantly from the northwest or the southeast and are gentle, with velocities over 16 miles per hour occurring only 5 percent of the time. Summer temperatures rise above 100 degrees an average of 39 days a year. In winter, temperatures fall below freezing an average of 27 days, from November through March. The intensity of rainfall in the area is elevation dependent, and the most intense precipitation is the result of localized cloudburst activity.

SURFACE HYDROLOGY

Site Features

The project site can be characterized as having relatively level topography with gradual slopes to some isolated steeper slopes. A majority of the site slopes in a south to north direction, with some isolated areas to the southern end that consist of steep hills up to 150 feet high. The site is covered by a mix of oak trees and grasses, intermittent streams and tributaries, riparian vegetation, and seasonal wetlands that flow predominantly in a southeasterly direction. Two named creeks exist on the property: Moody Creek and Rancheria Creek. These two creeks are connected to the watershed system located on the south side of Saddle Back Ridge. There are also nine ephemeral streams on the project site and seven intermittent streams, in addition to Moody and Rancheria creeks. According to the wetland delineation prepared by North Fork Associates (**Appendix 4.6-3**), approximately 57.82 acres of waters of the United States have been delineated. These include ephemeral streams, intermittent streams, wetland swales, seasonal wetlands and drainage ditches (see **Table 4.6-1** in Section 4.6, Biological Resources).

4.7 HYDROLOGY AND WATER QUALITY

PHOTO 4.7-1, INTERMITTENT STREAM, MOODY CREEK



PHOTO 4.7-2, UNNAMED INTERMITTENT STREAM (IS-2)



Existing Drainage

Most of the streams on the project site are intermittent and have some groundwater components. One of the unnamed intermittent streams located on the property is associated with a large wetlands complex and has a substantial groundwater component.

Geological studies done by ENGEO (see **Appendix 4.8-1**) indicate the presence of unfractured rock under most of the site between 5 and 15 feet below the soil surface. The water source for the large wetland complex is unknown, but water perched on unfractured rock probably contributes to the wetland hydrology.

GROUNDWATER

The proposed project is located within the Redding Groundwater Basin. The southern boundary of the basin is the Red Bluff Arch, a subsurface uplift that separates the basin from the Sacramento Valley Groundwater Basin. Approximately half of the Redding Groundwater Basin lies in Shasta County, with the remainder in Tehama County to the south. The Redding Groundwater Basin is recharged by the Sacramento River and by local creeks such as Clear Creek, Cottonwood Creek, Hooker Creek, Battle Creek, and Cow Creek. Precipitation, applied water, and subsurface flows also contribute to groundwater recharge. The general direction of subsurface flow in the Redding Groundwater Basin is from the northeast and northwest to the south.

PHOTO 4.7-3, EPHEMERAL STREAM (ES-2)

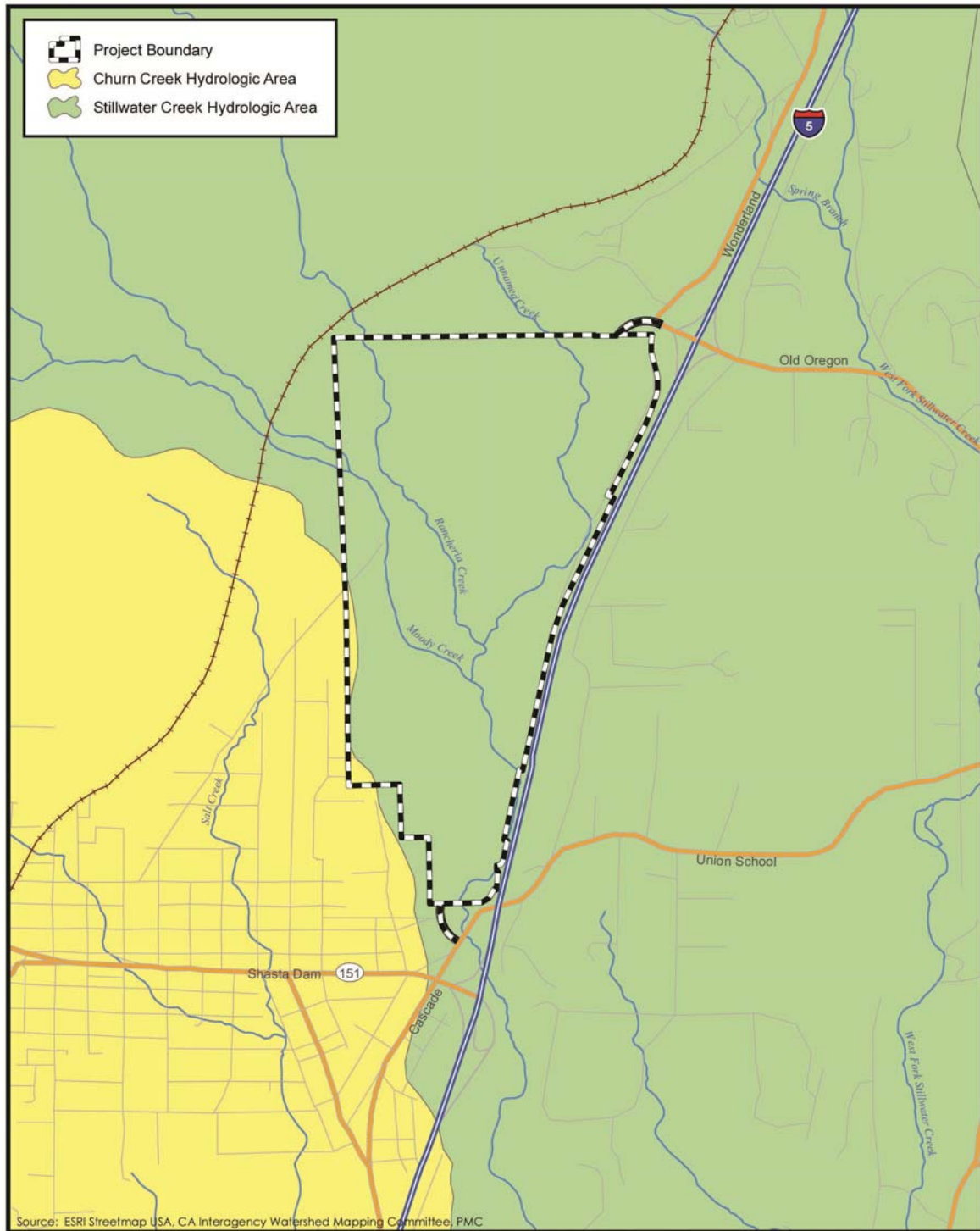


4.7 HYDROLOGY AND WATER QUALITY

WATER QUALITY

Water quality standards for all surface waters in the region are discussed in the region's Basin Plan, which covers the entire area included in the Sacramento and San Joaquin river drainage basins. The Sacramento River drainage basin covers 27,210 square miles and includes the entire area drained by the Sacramento River. The California Clean Water Act Section 303(d) list identifies water bodies with impaired water quality. According to this list, Moody Creek, Rancheria Creek, and any of the other unnamed ephemeral or intermittent streams on the project site are not designated as impaired (SWRCB 2010).

According to California Department of Water Resources (DWR) (2004) Bulletin 118, groundwater in the Redding Groundwater Basin is characterized as magnesium sodium bicarbonate and sodium magnesium bicarbonate-type waters. Total dissolved solids concentrations range from 109 to 320 milligrams per liter (mg/L), averaging 194 mg/L. Impairments include localized areas with high iron, manganese, and nitrate (DWR 2004).



NOT TO SCALE



Figure 4.7-1
Watersheds Within Project

PMC

4.7 HYDROLOGY AND WATER QUALITY

Recycled Water

The City of Shasta Lake has a reclaimed water system that terminates at the southerly boundary of the project site. The system provides disinfected tertiary recycled water to a number of users along the route of the pipe. Users include the Knauf Insulation plant, the California Department of Transportation (Caltrans), and Sierra Pacific Industries. The system is designed to enable irrigation of a wide variety of land uses and to provide discharge of treated water. A detailed discussion on the wastewater treatment plant and reclaimed water is included in Section 4.10 of this DEIR.

Flood Risk

The Federal Emergency Management Agency (FEMA) (March 17, 2011) Flood Insurance Rate Map for the project area (Community-Panel Numbers 060758-1236G, 060758-1228G, and 060758-1229G) shows that the majority of the project site is in Flood Zone X, indicating that the area is outside of the floodplain. However, the Area Plan contains many acres in floodplain zones, almost exclusively associated with ephemeral streams, intermittent streams, and other wetlands on the project site. These areas are shown on **Figure 3.0-3** and **Figure 3.0-5**.

4.7.2 REGULATORY FRAMEWORK

FEDERAL

Clean Water Act

The Clean Water Act (CWA), initially passed in 1972, regulates the discharge of pollutants into watersheds throughout the nation and establishes regional quality standards for surface waters. Section 402(p) of the act establishes a framework for regulating municipal and industrial stormwater discharges under the National Pollutant Discharge Elimination System (NPDES) Program.

National Pollutant Discharge Elimination System

As authorized by the CWA, the National Pollutant Discharge Elimination System (NPDES) permit program controls water pollution by regulating point sources that discharge pollutants into waters of the United States. It is the responsibility of the local water boards, which are discussed in more detail below, to preserve and enhance the quality of the state's waters through the development of water quality control plans and the issuance of waste discharge requirements. Waste discharge requirements for discharges to surface waters also serve as NPDES permits (SWRCB 2013).

The State Water Resources Control Board (SWRCB) is responsible for implementing the Clean Water Act and issues NPDES permits to cities and counties through Regional Water Quality Control Boards (RWQCBs). The project site is located in a portion of the state that is regulated by the Central Valley RWQCB.

On December 8, 1999, the US Environmental Protection Agency (EPA) circulated regulations requiring permits for stormwater discharges from Small Municipal Separate Storm Sewer System operators. Permits for small municipal storm sewer systems (MS4s) generally fall under the "Phase II" permits program, which regulates non-point source pollutants. In California, the NPDES Program is administered by the State Water Resources Control Board. Federal regulations allow two permitting options for stormwater discharges (individual permits and general permits). The

SWRCB elected to adopt a statewide general permit. The permits are discussed in more detail below.

Sections 401 and 404 of the CWA are administered through the Regulatory Program of the US Army Corps of Engineers (USACE) and regulate the water quality of all discharges of fill or dredged material into waters of the United States, including wetlands and intermittent stream channels. Section 401, Title 33, Section 1341 of the CWA sets forth water-quality certification requirements for any applicant applying for a federal license or permit to conduct any activity including, but not limited to, the construction or operation of facilities, which may result in any discharge into the navigable waters.

Section 404, Title 33, Section 1344 of the Clean Water Act in part authorizes the USACE to:

- Set requirements and standards pertaining to such discharges: subparagraph (e);
- Issue permits “for the discharge of dredged or fill material into the navigable waters at specified disposal sites:” subparagraph (a);
- Specify the disposal sites for such permits: subparagraph (b);
- Deny or restrict the use of specified disposal sites if “the discharge of such materials into such area would have an unacceptable, adverse effect on municipal water supplies and fishery areas:” subparagraph (c);
- Specify type of and conditions for non-prohibited discharges: subparagraph (f);
- Provide for individual state or interstate compact administration of general permit programs: subparagraphs (g), (h), and (j);
- Withdraw approval of such state or interstate permit programs: subparagraph (i);
- Ensure public availability of permits and permit applications: subparagraph (o);
- Exempt certain federal or state projects from regulation under this section: subparagraph (r); and
- Determine conditions and penalties for violation of permit conditions or limitations: subparagraph (s).

Total Maximum Daily Load

Under CWA Section 303(d) and California's Porter-Cologne Water Quality Control Act of 1969 (discussed below), the State of California is required to establish beneficial uses of state waters and to adopt water quality standards to protect those beneficial uses. Section 303(d) establishes the total maximum daily load (TMDL) process to assist in guiding the application of state water quality standards, requiring the states to identify waters whose water quality is “impaired” (affected by the presence of pollutants or contaminants) and to establish a TMDL or the maximum quantity of a particular contaminant that a water body can assimilate without experiencing adverse effects on the beneficial use identified. The establishment of TMDLs is generally a stakeholder-driven process that involves investigation of sources and their loading (pollution input), estimation of load allocations, and identification of an implementation plan

4.7 HYDROLOGY AND WATER QUALITY

and schedule. Where stakeholder processes are not effective, total maximum daily loads can be established by the RWQCBs or the EPA.

Federal Emergency Management Agency

The City of Shasta Lake and Shasta County are participants in the National Flood Insurance Program (NFIP), a federal program administered by FEMA. Participants in the NFIP must satisfy certain mandated floodplain management criteria. The National Flood Insurance Act of 1968 has adopted, as a desired level of protection, an expectation that developments should be protected from floodwater damage of the Intermediate Regional Flood (IRF). The IRF is defined as a flood that has an average frequency of occurrence on the order of once in 100 years, although such a flood may occur in any given year. The City is occasionally audited by the Department of Water Resources (DWR) to ensure the proper implementation of FEMA floodplain management regulations.

STATE

Porter-Cologne Water Quality Act

In 1969, the California Legislature enacted the Porter-Cologne Water Quality Control Act to preserve, enhance, and restore the quality of the state's water resources. The act established the State Water Resources Control Board and nine Regional Water Quality Control Boards as the principal state agencies with the responsibility for controlling water quality in California. Under the act, water quality policy is established, water quality standards are enforced for both surface water and groundwater, and the discharges of pollutants from point and nonpoint sources are regulated. The act authorizes the SWRCB to establish water quality principles and guidelines for long-range resource planning including groundwater and surface water management programs and control and use of recycled water (USDOE 2011).

State Water Resources Control Board

The five-member State Water Resources Control Board allocates water rights, adjudicates water right disputes, develops statewide water protection plans, establishes water quality standards, and guides the nine Regional Water Quality Control Boards located in the major watersheds of the state. The joint authority of water allocation and water quality protection enables the SWRCB to provide comprehensive protection for California's waters (SWRCB 2013). The SWRCB is responsible for implementing the Clean Water Act and issues NPDES permits to cities and counties through Regional Water Quality Control Boards.

California Division of Safety of Dams

Any new or existing dam over 6 feet, or reservoir with a capacity of more than 15 acre-feet, is subject to the review and approval of the California Division of Safety of Dams. The division requires that dam designs be earthquake and seiche resistant, and that any construction or alteration undergo a full seismic and geologic investigation. Water may be impounded in volumes above 15 acre-feet only upon the issuance of a Certificate of Approval from the division.

REGIONAL**Regional Water Quality Control Board, Central Valley Region**

The Central Valley RWQCB provides planning, monitoring, and enforcement techniques for surface water and groundwater quality in the Central Valley region, including the project site. A basin plan provides more specific information for specific waterways in the region, in terms of establishing monitoring techniques to control pollutant levels in the waterways. The RWQCB also monitors stormwater quality from construction activities through a NPDES permitting process. The RWQCB is responsible for establishing water quality standards and objectives that protect the beneficial uses of various waters. In Shasta County, the RWQCB is responsible for protecting surface water and groundwater from both point and non-point sources of pollution.

Central Valley Regional Water Quality Control Plan

The Central Valley Regional Water Quality Control Plan, also known as the Basin Plan, covers all of the drainage basin areas for the Sacramento and San Joaquin rivers, extending approximately 400 miles from the California-Oregon border to the headwaters of the San Joaquin River. This plan describes the beneficial uses to be protected in these waterways, water quality objectives to protect those uses, and implementation measures to make sure those objectives are achieved.

National Pollutant Discharge Elimination System

The NPDES permit system was established in the Clean Water Act to regulate municipal and industrial discharge to surface waters of the United States. Each NPDES permit contains limits on allowable concentrations and mass emissions of pollutants contained in the discharge. Permits require the municipal authority to evaluate the quality of its stormwater discharge and receiving waters, identify areas of pollutant loading, and implement a program of best management practices (BMPs) to control pollutant discharges to the maximum extent practicable. It is within the existing authority of the Central Valley RWQCB to issue a NPDES permit for any stormwater outfall that discharges to the waters in the region.

Municipal Storm Water Permitting Program

Discharges from municipal separate storm sewer systems (MS4s) are regulated because of concern over the high concentration of pollutants found in those discharges. MS4 permits were issued by the various RWQCBs in two phases.

Under Phase I, which started in 1990, the Regional Water Quality Control Boards have adopted NPDES General Permit stormwater permits for medium (serving between 100,000 and 250,000 people) and large (serving 250,000 people) municipalities. Most of these permits are issued to a group of co-permittees encompassing an entire metropolitan area. These permits are reissued as the permits expire.

On February 5, 2013, the SWRCB adopted a NPDES General Permit for Waste Discharges from Small Municipal Separate Storm Sewer Systems (MS4s) (Order No. 2013-0001-DWQ, NPDES No. CAS000004). The MS4 Permit became effective July 1, 2013, and expires June 30, 2018. The Permit regulates storm water runoff from the City's streets, catch basins, curbs, gutters, ditches, man-made channels, storm drains, roads with drainage systems, etc., that are used for collecting or conveying storm water.

4.7 HYDROLOGY AND WATER QUALITY

The MS4 permit requires the discharger to develop and implement a Stormwater Management Plan/Program with the goal of reducing the discharge of pollutants to the maximum extent practicable (MEP). MEP is the performance standard specified in Section 402(p) of the Clean Water Act. The management programs specify what best management practices will be used to address certain program areas. The program areas include public education and outreach, illicit discharge detection and elimination, construction and post-construction, and good housekeeping for municipal operations.

Permit compliance for each of the program elements is phased over the five-year permit term. Under the MS4 Permit, the City is required to regulate development to ensure compliance with the following sections of the Permit:

- Site design measures
- Regulated projects
- Source control measures
- Low Impact Development (LID) design standards
- Hydromodification measures
- Enforceable mechanisms
- Operation and maintenance of storm water control measures
- Post-construction best management practice condition assessment
- Planning and development review process
- Post-construction storm water management requirements based on assessment and maintenance of watershed processes
- Alternative post-construction storm water management program.

Certain actions during construction may also need to conform to the waste discharge requirements included in the General Order for Dewatering and Other Low Threat Discharges to Surface Waters (Water Quality Order No. R5-2013-0074, NPDES No. CAG995001), which became effective on May 31, 2013.

The Dewatering General Order requires that a permit be acquired for dewatering and other low threat discharges to surface waters, provided that they do not contain significant quantities of pollutants and either (1) are four months or less in duration, or (2) the average dry weather discharge does not exceed 0.25 million gallons per day (MGD). Examples of activities that may require the acquisition of such a permit include construction dewatering, pump/well testing, pipeline/tank pressure testing, pipeline/tank flushing or dewatering, water supply system discharges, and other miscellaneous dewatering/low threat discharges. However, the actions applicable to site development may already be covered under the CGP, and therefore a separate permit under the Dewatering General Order may not be required.

On September 2, 2009, the SWRCB adopted a new CGP (Order No. 2009-0009-DWQ, as amended by Order No. 2010-0014-DWQ) that superseded the existing Construction General

Permit on July 1, 2010. The Construction General Permit (CGP) is implemented and enforced by the RWQCBs.

The CGP applies to construction activity that disturbs 1 acre or more or less than 1 acre if it is part of a larger plan of development. The CGP requires the preparation and implementation of a stormwater pollution prevention plan (SWPPP) that identifies best management practices (BMPs) to minimize pollutants from discharging from the construction site to the maximum extent practicable. The SWPPP must include implementing best management practices to reduce construction effects on receiving water quality by implementing erosion control measures and reducing or eliminating non-stormwater discharges. Examples of typical construction BMPs in stormwater pollution prevention plans include, but are not limited to, using temporary mulching, seeding, or other suitable stabilization measures to protect uncovered soils; storing materials and equipment to ensure that spills or leaks cannot enter the storm drain system or surface water; developing and implementing a spill prevention and cleanup plan; and installing sediment control devices such as gravel bags, inlet filters, fiber rolls, or silt fences to reduce or eliminate sediment and other pollutants from discharging to the city's drainage system or receiving waters.

General Permit applicants are required to submit to the appropriate regional board Permit Registration Documents for the project, which include a Notice of Intent (NOI), a risk assessment, a site map, a signed certification statement, an annual fee, and a stormwater pollution prevention plan. The permit program is risk based wherein a project's risk is based on the project's potential to cause sedimentation and the risk of such sedimentation on the receiving waters. A project's risk determines its water quality control requirements ranging from Risk Level 1, which consists of only narrative effluent standards, implementation of BMPs, and visual monitoring, to Risk Level 3, which consists of numeric effluent limitations, additional sediment control measures, and receiving water monitoring. Components of this General Permit include:

Rainfall Erosivity Waiver: This General Permit includes the option allowing a small construction site (>1 and <5 acres) to self-certify if the rainfall erosivity value (R value) for their site's given location and time frame compute to be less than or equal to 5.

Technology-Based Numeric Action Levels: Numeric Action Levels (NACs) for pH and turbidity.

Technology-Based Numeric Effluent Limitations: Daily average numeric effluent limitations (NELs) for pH during any construction phase where there is a high risk of pH discharge and daily average NELs turbidity for all discharges in Risk Level 3. The daily average NEL for turbidity is set at 500 NTU [turbidity] to represent the minimum technology that sites need to employ (to meet the traditional Best Available Technology Economically Achievable (BAT)/Best Conventional Pollutant Control Technology (BCT) standard) and the traditional, numeric receiving water limitations for turbidity.

Risk-Based Permitting Approach: There are three levels of risk possible for a construction site. Risk is calculated in two parts: (1) Project Sediment Risk and (2) Receiving Water Risk.

Minimum Requirements Specified: Imposes more minimum BMPs and requirements that were previously only required as elements of the SWPPP or were suggested by guidance.

Project Site Soil Characteristics Monitoring and Reporting: Provides the option for dischargers to monitor and report the soil characteristics at their project location. The primary purpose of this requirement is to provide better risk determination and eventually better program evaluation.

4.7 HYDROLOGY AND WATER QUALITY

Effluent Monitoring and Reporting: Requires effluent monitoring and reporting for pH and turbidity in storm water discharges. The purpose of this monitoring is to determine compliance with the NELs and evaluate whether NALs included in this General Permit are exceeded.

Receiving Water Monitoring and Reporting: Requires some Risk Level 3 dischargers to monitor receiving waters and conduct bioassessments.

Post-Construction Stormwater Performance Standards: Specifies runoff reduction requirements for all sites not covered by a Phase I or Phase II MS4 NPDES permit, to avoid, minimize, and/or mitigate post-construction stormwater runoff impacts.

Rain Event Action Plan: Requires certain sites to develop and implement a Rain Event Action Plan (REAP) that must be designed to protect all exposed portions of the site within 48 hours prior to any likely precipitation event.

Annual Reporting: Requires all projects that are enrolled for more than one continuous three-month period to submit information and annually certify that their site is in compliance with these requirements. The primary purpose of this requirement is to provide information needed for overall program evaluation and public information.

Certification/Training Requirements for Key Project Personnel: Requires that key personnel (e.g., SWPPP preparers, inspectors) have specific training or certifications to ensure their level of knowledge and skills are adequate to ensure their ability to design and evaluate project specifications that will comply with General Permit requirements.

Linear Underground/Overhead Projects: Includes requirements for all Linear Underground/Overhead Projects (LUPs).

LOCAL

City of Shasta Lake General Plan

The City of Shasta Lake General Plan provides objectives and policies related to water resources, water quality, and storm drainage. **Table 4.7-1** analyzes the project's consistency with these relevant policies. While this Draft EIR analyzes the project's consistency with the General Plan pursuant to California Environmental Quality Act (CEQA) Section 15125(d), it is the City of Shasta Lake Planning Commission and/or City Council that will make the determination of the project's consistency with the identified General Plan policies.

TABLE 4.7-1
PROJECT CONSISTENCY WITH CITY OF SHASTA LAKE
GENERAL PLAN: HYDROLOGY AND WATER QUALITY

General Plan Objectives & Policies	Consistent with General Plan?	Analysis
Water Resources and Quality Policies		
W-a The City shall maintain standards for erosion and sediment control plans for development.	Yes, with mitigation	The project is required to comply with the various requirements of the SWRCB statewide general permits for construction and

4.7 HYDROLOGY AND WATER QUALITY

General Plan Objectives & Policies	Consistent with General Plan?	Analysis
		dewatering, Section 1603 of the California Fish and Wildlife Code, and a Streambed Alteration Agreement with the California Department of Fish and Wildlife, as well as the City's grading permit requirements, which ensure that water quality degradation during the construction phase of the proposed project would be minimized. Also, implementation of mitigation measures MM 4.7.2a through MM 4.7.2e would reduce the project's operational water quality impacts to a less than significant level.
W-b Septic systems, waste disposal sites, and other sources of hazardous or polluting materials shall be designed to prevent contamination to rivers, creeks, streams, reservoirs, or the groundwater basin in accordance with standards accepted by or imposed by the City, Shasta County Environmental Health Division and the State Regional Water Quality Control Board.	Yes	Development of the proposed project is anticipated to locate outside of the wetland features. A number of stream crossings are proposed, which would comply with requirements set by the permitting agencies. Further, no septic systems are proposed.
Water Resources and Quality Implementation Measures		
W-(5) Require the use of Best Management Practices to control runoff from all new development, including the issuance of building permits.	Yes, with mitigation	The proposed project would apply best management practices (BMPs) for all grading and construction, as well as post-construction operations. See mitigation measures MM 4.7.2a through MM 4.7.2e.
W-(6) Continue to require project proponents to provide plans for erosion and sedimentation control from their sites during construction.	Yes, with mitigation	See mitigation measures MM 4.7.2a and MM 4.7.2e.
W-(7) Explore alternatives to storm water collection methods, including the use of detention/retention basins to implement the "no net runoff" concept.	Yes	Several detention basins are planned in the existing drainage courses. The basins are created using planned road crossings and allow the stormwater to stay in channel.
W-(8) Establish storm water run-off reduction standards for projects larger than five acres and incentives for "zero-net" storm water runoff, such as reduced storm drainage impact fees.	Yes	See consistency analysis W-(7) above.

4.7 HYDROLOGY AND WATER QUALITY

General Plan Objectives & Policies	Consistent with General Plan?	Analysis
Open Space, Parks, and Recreation Policies		
OSR-b The significant creek and streamside corridors in the City of Shasta Lake shall be designated on the General Plan Maps. The primary purpose of this designation is to protect the riparian habitats from development. The purpose is also to encourage open space and recreation. Riparian habitat protection along the significant river and creekside corridors as designated on the plan maps shall be achieved, where appropriate.	Yes	Two creek corridors exist within the project site: Rancheria Creek and Moody Creek. The design of the site has been modified to avoid or minimize the impact to these creeks.
Open Space, Parks, and Recreation Implementation Measures		
OSR-(7) Encourage development of future detention basins for joint storm water management/park use, where feasible, and require coordinated City review regarding the selection of sites for any detention basins and the use of storm water runoff controls built into the landscape, where appropriate.	Yes, with mitigation	See mitigation measures MM 4.7.2e and MM 4.7.4.
Flood Protection Objectives		
FL-1 Protect public health and safety, both on-site and downstream, from flooding through floodplain management which regulates the types of land uses which may locate in the floodplain, prescribes construction designs for floodplain development, and requires mitigation measures for development which would impact the floodplain by increasing runoff quantities.	Yes	As shown on Figure 3.0-3, the project has been designed to avoid development within a 100-year flood hazard area to minimize impacts from flooding and would not be affected by any off-site sources of flooding.
Flood Protection Policies		
FL-a New development in floodplains shall be regulated through zoning regulations addressing land use type, density, and siting of structures.	Yes	The Area Plan contains several acres in floodplain zones that would be avoided under the proposed project and have been incorporated into wetland preservation.
FL-c Flood control measures shall consist of channel diversions or limited floodplain designs, which avoid to the maximum extent feasible, alteration of creeks and their immediate environs.	Yes	The Area Plan contains several acres in floodplain zones that would be avoided under the proposed project. Drainage would be accommodated on-site through stormwater infrastructure, such as storm drains, culverts, and open drainage channels. Detention facilities are proposed as a method of mitigation of peak discharges for the developed runoff from the site. The alteration of creeks on the project site is not proposed.

General Plan Objectives & Policies	Consistent with General Plan?	Analysis
FL-i The impacts of new development on the floodplain or other downstream areas due to increased runoff from that development shall be mitigated.	Yes, with mitigation	Preconstruction and post-construction stormwater runoff peaks for each detention facility are noted in Table 4.7-2. Implementation of mitigation measure MM 4.7.2e would ensure that the proposed on-site stormwater infrastructure is constructed to the level of operation described in Table 4.7-2.
Flood Protection Implementation Measures		
FL-(1) As part of project review, ensure that structures subject to the 100-year flood provide adequate protection from flood hazards.	Yes	The Area Plan contains several acres in floodplain zones that would be avoided under the proposed project and have been incorporated into wetland preservation.
FL-(2) In designing flood control facilities, consider the need to protect anadromous fisheries and allow for adequate water passage to ensure the survival of downstream riparian ecosystems.	Yes	The project site is not located in a known migratory corridor of any California Department of Fish and Wildlife-designated species. The project site is located next to an urban area adjacent to and to the north of Interstate 5. The site does not support anadromous fish habitat. See discussion for Impact 4.6.6.

City of Shasta Lake Municipal Code

The City adopted the Floodplain Management Ordinance in 1997 to establish uses permitted or excluded from the floodplain areas and necessary permit processing procedures and development standards. This ordinance requires any residential development approved in an special flood hazard zone to have finished floor elevations a minimum of 1 foot above the 100-year flood elevation. Nonresidential construction must either be elevated or be floodproofed below the recommended one-foot elevation so that the structure is watertight with walls substantially impermeable to the passage of water and have structural components capable of resisting hydrostatic and hydrodynamic loads and effects of buoyancy.

The City repealed Municipal Code Chapter 12.16 (Grading, Excavation, and Filling Standards) and added Chapter 15.08, Grading, Erosion Control, and Hillside Development, to the City's Municipal Code to regulate clearing and grading on private and public property and to provide standards and design criteria implementing best management practices to control stormwater and erosion during all construction activities for all development. This chapter of the Municipal Code sets forth rules and regulations to control excavation, grading, earthwork construction including fills and embankments, and development on hillsides and along ridgelines; establishes the administrative procedure for issuance of permits; and provides for approval of plans and inspection of grading construction.

4.7.3 IMPACTS AND MITIGATION MEASURES

STANDARDS OF SIGNIFICANCE

Based on Appendix G of the CEQA Guidelines, the City of Shasta Lake concludes that a project may have significant impacts on hydrology and water quality if it does any of the following:

4.7 HYDROLOGY AND WATER QUALITY

- 1) Violates any water quality standards or waste discharge requirements.
- 2) Substantially depletes groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volumes or a lowering of the local groundwater table level.
- 3) Substantially alters the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner which would result in substantial erosion or siltation on- or off-site.
- 4) Substantially alters the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increases the rate or amount of surface runoff in a manner which would result in flooding on- or off-site.
- 5) Creates or contributes runoff water which would exceed the capacity of existing or planned stormwater drainage systems.
- 6) Creates or contributes substantial additional sources of polluted runoff, or otherwise substantially degrades water quality.
- 7) Places housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map.
- 8) Places within a 100-year flood hazard area structures which would impede or redirect flood flows.
- 9) Exposes people or structures to a significant risk of loss, injury, or death involving flooding, including flooding as a result of the failure of a levee or dam.
- 10) Exposes people or structures to a hazard of inundation by seiche, tsunami, or mudflow.

METHODOLOGY

The hydrology and water quality analyses were based on consultation with appropriate agency representatives; a review of published information and reports regarding regional hydrology, climate, and geology; the Mountain Gate at Shasta Area Plan and subsequent environmental documentation; and review of the project applicant's technical studies, which included the following documents:

- Preliminary Geotechnical Report by GCI (2011) (see **Appendix 4.8-1**)
- Preliminary geologic and geotechnical reconnaissance report by ENGEO (2005) (see **Appendix 4.8-2**)
- Wetlands delineation by North Fork Associates and a wetland delineation of jurisdictional waters prepared by Salix in February 2012, which are included as **Appendices 4.6-3 and 4.6-4.**

IMPACTS AND MITIGATION MEASURES

Violation of Water Quality Standards and/or Degradation of Water Quality with the Contribution of Erosion, Siltation, or Polluted Runoff During Construction (Standards of Significance 1, 3, and 6)

Impact 4.7.1 Soil and slope disturbance associated with construction activities for the proposed project could cause accelerated soil erosion and sedimentation or the release of other construction-related pollutants into adjacent waterways. The proposed project will result in a **less than significant** impact.

Vegetation removal and earth-moving activities associated with project construction may have the greatest potential for detrimental impacts to surface water quality associated with Moody Creek, Rancheria Creek, and ephemeral and intermittent streams on the project site. Grading and the removal of vegetation during project construction could expose site soils to rainsplash, sheet flow, and gully erosion prior to successful revegetation. The cleared, exposed surfaces and soil stockpiles created during construction could create sedimentation in downstream waters. Fuels, lubricants, and other toxic materials used during construction could also potentially enter surface waters. Operation, refueling, and parking of construction equipment and other vehicles on-site may result in spills of fuel, oil, grease, or related pollutants that may discharge into on-site drainages. Improper handling, storage, or disposal of fuels and materials or improper maintenance of machinery may cause water quality degradation.

In addition, the development of stream crossings would result in alteration of natural swales within the project site and could increase erosion and sedimentation during periods when the swales have water if actions are not taken to prevent such occurrences. Intermittent drainage habitat on the project site is considered jurisdictional waters of the United States and is regulated under Sections 401 and 404 of the Clean Water Act. Additionally, a streambed crossing or culvert through an area determined to be jurisdictional waters of the United States is subject to permitting from the USACE and the California Department of Fish and Wildlife (CDFW). If intermittent drainage features can be avoided, no mitigation is necessary. However, if the project design encroaches on these drainages, impacts are considered potentially significant and subject to mitigation.

The SWRCB is responsible for implementing the Clean Water Act and has issued a Statewide General Permit (Water Quality Order 2009-0009-DWQ as amended by Order No. 2010-0014-DWQ) for construction activities within the state (see the Regulatory Framework subsection above). In the project area, the Construction General Permit (CGP) is implemented and enforced by the Central Valley RWQCB. In accordance with the requirements of the CGP, prior to construction of the proposed project, a risk assessment must be prepared and submitted to the Central Valley RWQCB to determine the project's risk level and associated water quality control requirements. These requirements will, at a minimum, include the preparation and implementation of a stormwater pollution prevention plan (SWPPP), described in detail above, identifying specific best management practices to be implemented and maintained on the site in order to comply with the applicable narrative effluent standards. Preparation and review of the SWPPP shall be completed by a certified SWPPP QSD in compliance with the MS4 permit as discussed above.

The best management practices that must be implemented as part of a SWPPP can be grouped into two major categories: (1) erosion and sediment control BMPs and (2) non-stormwater management and materials management BMPs. Erosion and sediment control BMPs

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fall into four main subcategories: erosion controls, sediment controls, wind erosion controls, and tracking controls.

Erosion controls include practices to stabilize soil, to protect the soil in its existing location, and to prevent soil particles from migrating. Examples of erosion control BMPs are preserving existing vegetation, mulching, and hydroseeding. Sediment controls are practices to collect soil particles after they have migrated, but before the sediment leaves the site. Examples of sediment control BMPs are street sweeping, fiber rolls, silt fencing, gravel bags, sand bags, storm drain inlet protection, sediment traps, and detention basins. Wind erosion controls prevent soil particles from leaving the site in the air. Examples of wind erosion control BMPs include applying water or other dust suppressants to exposed soils on the site. Tracking controls prevent sediment from being tracked off-site via vehicles leaving the site to the extent practicable. A stabilized construction entrance not only limits the access points to the construction site, but also functions to partially remove sediment from vehicles prior to leaving the site.

Non-stormwater management and material management controls reduce non-sediment-related pollutants from potentially leaving the construction site to the extent practicable. The Construction General Permit prohibits the discharge of materials other than stormwater and authorized non-stormwater discharges (such as irrigation and pipe flushing and testing). Non-stormwater BMPs tend to be management practices with the purpose of preventing stormwater from coming into contact with potential pollutants. Examples of non-stormwater BMPs include preventing illicit discharges and implementing good practices for vehicle and equipment maintenance, cleaning, and fueling operations, such as using drip pans under vehicles. Waste and materials management BMPs include implementing practices and procedures to prevent pollution from materials used on construction sites. Examples of materials management BMPs include:

- Good housekeeping activities such as storing of materials covered and elevated off the ground, in a central location.
- Securely locating portable toilets away from the storm drainage system and performing routine maintenance.
- Providing a central location for concrete washout and performing routine maintenance.
- Providing several dumpsters and trash cans throughout the construction site for litter/floatable management.
- Covering and/or containing stockpiled materials and overall good housekeeping on the site.

The CGP also requires that construction sites be inspected before and after storm events and every 24 hours during extended storm events. Inspections must be completed by a certified SWPPP QSP pursuant to the MS4 permit. The purpose of the inspections is to identify maintenance requirements for the BMPs and to determine the effectiveness of the BMPs that are being implemented. The SWPPP is a “living document” and as such can be modified as construction activities progress. Additional requirements include compliance with post construction standards focusing on low impact development (LID) and preparation of rain event action plans.

The SWRCB has also issued a Statewide General Permit (Water Quality Order No. R5-2013-0074, NPDES No. CAG995001) for dewatering and other low-threat discharges to surface waters in the state. Should construction of the proposed project require dewatering, the project applicant

would be required to submit a Notice of Intent, as well as a Best Management Practices Plan, to comply with the general permit. The BMP Plan would include disposal practices to ensure compliance with the general permit such as the use of sediment basins or traps, dewatering tanks, or gravity or pressurized bag filters. Monitoring and reporting would also be performed to ensure compliance with the permit.

In addition to the statewide regulations described above, the proposed project will be subject to the requirements of Chapter 15.08 of the City's Municipal Code related to grading. In accordance with these requirements, the project applicant cannot commence or perform any clearing or grading or export or import any earth materials to or from any site without a written permit from the Development Services Director or his/her designee. Additionally, a separate permit is required when grading is to be done within 50 feet of the high water mark of a seasonal watercourse or in the 100-year floodplain of a stream, creek, or river. Since the period between October 1 and the following April 30 is found to be the period in which heavy rainfall normally occurs in the city, no clearing or grading in excess of 250 cubic yards may be commenced on any single site if the City Engineer or Public Works Director determines by visual inspection that such work will endanger the public health and safety or is otherwise prohibited by state or federal regulations.

If work is allowed during the wet weather season, the permit shall include a wet weather operating and erosion control plan. During the wet weather season, erosion-control measures are required to be installed at the construction site at the end of the day or prior to weekend shutdown periods if the National Weather Service forecasts a 30 percent or greater chance of precipitation. All materials necessary to implement the wet weather operating and erosion control plan are required to be on-site prior to commencement of work.

Regarding potential impacts associated with the development of stream crossings, Section 1603 of the California Fish and Wildlife Code requires that the CDFW must be notified of any project that substantially changes the bed, channel, or bank of any stream, including streams with periodic flows. Work on channel crossings within the project site would be subject to a Streambed Alteration Agreement with the CDFW. Streambed Alteration Agreements typically come with conditions designed to avoid any adverse effects by a project on streams and water quality.

In addition to USACE and CDFW oversight, jurisdictional waters are also regulated by the Regional Water Quality Control Board through the water quality certification process. Mitigation measures have been identified in Section 4.6, Biological Resources, under mitigation measures **MM 4.6.3a** and **MM 4.6.3b**, requiring the project applicant to acquire USACE, Central Valley RWQCB, and CDFW permits to address water quality concerns raised by developing within and adjacent to intermittent drainages and other waters of the United States. Implementation of these mitigation measures would minimize the potential for an increase in erosion and sedimentation associated with the development of stream crossings and would protect water quality.

Compliance with the various requirements of the SWRCB statewide general permits for construction and dewatering, the MS4 general permit, Section 1603 of the California Fish and Wildlife Code, and a Streambed Alteration Agreement with the CDFW, as well as the City's grading permit requirements, will ensure that water quality degradation during the construction phase of the proposed project would be minimized. Therefore, this impact is **less than significant**.

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Mitigation Measures

None required.

Violation of Water Quality Standards and/or Degradation of Water Quality with the Contribution of Erosion, Siltation, or Polluted Runoff During Operations (Standards of Significance 1, 3, and 6)

Impact 4.7.2 Development and operation of the proposed project could increase surface runoff, which may contain contaminants that could enter surface waters and possibly groundwater. This will result in a **potentially significant** impact.

Buildout of the project site would urbanize areas on the site and would result in a substantial alteration to the existing site conditions. This conversion would substantially increase the impervious surface area of the Area Plan through the introduction of new and improved roads and driveways, parking areas, rooftops, and other surfaces. An increase in impervious surface area would substantially increase runoff potentially containing oil and grease, heavy metals, chemicals, and other urban pollutants. Runoff from the proposed landscape areas could also contribute pollutants from fertilizers and pesticides. Runoff from both residential and commercial areas is a contributing factor to water quality degradation and the introduction of urban pollutant sources.

In terms of the Area Plan drainage collection system, modifications may be made as buildout occurs only as approved by the City. The drainage system would be expanded in accordance with prevailing City policies and standards to serve subdivision of the Area Plan area. Area Plan drainage facilities are required to be based on plans approved by the City or utility provider and would be inspected during construction to ensure compliance with City or utility provider requirements.

Phasing of the Area Plan must be carefully coordinated to ensure comprehensive and efficient buildout. Public services and facilities such as storm drainage can be phased to match the pace of development and to respond to the growing needs of the community as they arise. Furthermore, consistent with the post-construction requirements of the SWRCB General Construction Permit and the MS4 General Permit, best management practices will be implemented and low impact development (LID) techniques will be utilized to minimize off-site drainage and water quality degradation. Potential BMPs to be implemented are described in detail under Impact 4.7.1 above. Incorporation of LID techniques into proposed future development and implementation of appropriate BMPs post-construction would remove sediment and pollutants from site runoff and minimize impacts to downstream surface water and groundwater resources.

There are two named creeks that exist on the property, Moody Creek and Rancheria Creek, as well as ephemeral and intermittent streams. Moody Creek and Rancheria Creek are connected to the watershed system located on the south side of Saddle Back Ridge, which separates the site from Shasta Lake. The California Department of Fish and Wildlife recommends that all project disturbances stay a minimum of 100 feet from the top of primary tributary streambanks or 50 feet from the outer edge of riparian vegetation, whichever is greater. For secondary tributaries, the CDFW recommends that all project disturbances maintain a buffer of at least 50 feet from the top of the streambank or 25 feet from the outer edge of riparian vegetation, whichever is greater. With the exception of road and possible trail crossings, the proposed project meets these requirements.

As each development area is further subdivided and construction proposed, small debris basins and filtration methods will be included in the individual projects. These facilities are designed to remove debris from the stormwater flow and filter the runoff. The overall project will have a series of drainage basins designed within the drainages as shown on **Figure 4.7-2**. These basins will be designed to allow normal storm flow to pass unimpeded under planned roadways. As storm volume increases, the stormwater will be allowed to pool upstream of the roadways and slowly drain. The system is designed to keep the stormwater within the boundaries of the drainage.

Due to the significant amount of public landscaping that requires fertilizers, and because runoff generated by the project would be substantially greater than that under existing conditions, this impact is considered **potentially significant**.

Mitigation Measures

MM 4.7.2a **Water Quality Control Plan:** The project applicant shall submit a water quality control plan for operation of the project site. Permanent water quality features will be incorporated into project development plans and will include best management practices (BMPs) to minimize and control pollutants in stormwater runoff. Water quality control measures identified in the water quality control plan can include, but are not limited to, the following:

- Sediment shall be retained on-site by a system of sediment basins, traps, or other appropriate measures.
- Description of measure to reduce “first flush” contaminants after construction, as well as plans for maintenance, funding, and scheduling for servicing the drainage system.

Timing/Implementation: *Prior to approval of subsequent tentative subdivision maps or other discretionary permits, and/or issuance of grading permits*

Enforcement/Monitoring: *City of Shasta Lake Public Works Department; Central Valley Regional Water Quality Control Board*

MM 4.7.2b The development plans of future development under the proposed project shall contain specific structural and non-structural post-construction BMPs, such as grassed swales, bioretention, porous pavement, treatment vaults, retention of buffer strips, minimization of impervious surfaces, and approximate locations of each BMP.

Timing/Implementation: *Prior to approval of subsequent tentative subdivision maps or other discretionary permits, and/or issuance of grading permits*

Enforcement/Monitoring: *City of Shasta Lake Public Works Department; Central Valley Regional Water Quality Control Board*

MM 4.7.2c The overall design and development of the Mountain Gate at Shasta Area Plan shall include post-construction stormwater BMPs to mitigate for stormwater discharges associated with the post-development of the site. The

4.7 HYDROLOGY AND WATER QUALITY

BMPs shall be incorporated into the project, as described in the application package, to treat stormwater runoff from the site.

Timing/Implementation: *Prior to approval of subsequent tentative subdivision maps or other discretionary permits, and/or issuance of grading permits*

Enforcement/Monitoring: *City of Shasta Lake Public Works Department; Central Valley Regional Water Quality Control Board*

MM 4.7.2d The project applicant shall develop a landscaping plan to include provisions for the use of slow release fertilizers for common landscape areas.

Timing/Implementation: *Prior to approval of subsequent tentative subdivision maps or other discretionary permits*

Enforcement/Monitoring: *City of Shasta Lake Development Services Department; Central Valley Regional Water Quality Control Board*

MM 4.7.2e As part of the submittal of improvement plans for each phase of the project, the project applicant shall submit and obtain approval of a final drainage plan. The plan shall be prepared by a registered civil engineer and shall, at a minimum, include the following:

- A written narrative addressing existing conditions, the effects of project improvements, all appropriate calculations, a watershed map, changes in downstream flows and flood elevations, proposed on- and off-site improvements, features to protect downstream uses and property, and whether any drainage easements are needed to accommodate downstream flows from the project. Project drainage features shall be designed to ensure that no change in downstream flow conditions would result in new or increased severity of flooding for each phase of development.
- The drainage details shall address storm drainage management during construction and thereafter and shall propose best management practice measures to reduce erosion, water quality degradation, etc. Permanent water quality control features shall demonstrate that the water quality controls would ensure that stormwater discharges would not result in pollutant levels or concentrations that would have a detrimental effect on aquatic life in ephemeral or intermittent creek drainages. Stormwater discharges shall be in compliance with all current requirements of the Central Valley Regional Water Quality Control Board.
- Storm drainage from on-site impervious surfaces shall be collected and treated to protect existing water quality. The maintenance of facilities shall be the responsibility of the project applicant. When the community is under control of a homeowners association and/or facilities are located on property owned by the association, it is the association's obligation to provide facility maintenance. Where facilities are the responsibility of the

City, easements for access to and maintenance of these facilities shall be created and offered for dedication to the City.

- Conformance with applicable City of Shasta Lake drainage requirements shall be demonstrated.
- All related underground and surface drainage systems shall be addressed in order to ensure full integration of areas that would generate runoff. These areas would include rooftops, sidewalks, cut/fill slopes, patio areas, streets, parking lots, up-gradient off-site source areas, and impervious landscaping areas. Seepage from underground sources must also be addressed.
- The report shall show that post-project flows would not exceed pre-project flows and the associated drainage improvements required to meet these standards.

Timing/Implementation: *Prior to approval of subsequent tentative subdivision maps or other discretionary permits, and included in a final drainage report.*

Enforcement/Monitoring: *City of Shasta Lake Public Works Department*

Implementation of mitigation measures **MM 4.7.2a** through **MM 4.7.2e** would reduce the project's operational water quality impacts to a **less than significant** level.

Substantially Deplete Groundwater Supply or Interfere with Groundwater Recharge (Standard of Significance 2)

Impact 4.7.3 The proposed project could potentially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volumes or a lowering of the local groundwater table level. This is considered a **less than significant** impact.

With development of the project, some of the pervious soils on the site will be replaced with impervious surfaces such as paving and buildings. The addition of impervious surfaces would decrease the area available for water penetration, thereby reducing local groundwater recharge potential. However, all runoff from impervious surfaces would be directed to water quality treatment facilities such as grass swales and/or detention facilities prior to returning to sheet flow to connect to natural swales located on the site. Therefore, because runoff would eventually be directed to areas with pervious surfaces such as natural swales, and because the area designated as open space (221 acres) would continue to provide for groundwater recharge, the potential reduction in groundwater recharge associated with the project is small.

There are ephemeral intermittent streams, in addition to Moody and Rancheria creeks on the project site. These waterways act as aquifer recharge areas, and as shown on **Figure 3.0-3**, the project has been designed to avoid development in these areas. Furthermore, the project's domestic water demands would be met by surface water supplies provided by the federal Central Valley Project from the impoundment behind Shasta Lake Dam. Lastly, implementation of mitigation measure **MM 4.7.2e**, described above, would reduce impacts associated with post-project storm drainage rates.

4.7 HYDROLOGY AND WATER QUALITY

Subsequent development under the proposed Area Plan would connect to the City's water system and would not rely on groundwater supplies.

This impact is considered **less than significant**.

Mitigation Measures

None required.

Substantially Alter the Existing Drainage Patterns or Increase the Rate or Amount of Surface Runoff in a Way That Results in Flooding (Standard of Significance 4)

Impact 4.7.4 The proposed project could substantially alter the existing drainage pattern of the site or area, or could increase the amount of surface water, in a manner which could result in flooding on- or off-site. This will result in a **potentially significant** impact.

The proposed project would involve several improvements, including new roads and modifications to existing roadways, residential, commercial, and mixed-use development, parks, and open space. This conversion would substantially increase the impervious surface area of the site through the introduction of driveways, parking areas, rooftops, and other surfaces. An increase in impervious surface area would substantially increase runoff. General Plan Policy FL-c states, "Flood control measures shall consist of channel diversions or limited floodplain designs, which avoid to the maximum extent feasible, alteration of creeks and their immediate environs."

As discussed in the draft site drainage plan (**Appendix 4.7-1**), in order to mitigate increases in runoff production, the project site will incorporate a number of separate detention facilities that are located throughout the Area Plan (see **Figure 4.7-2** and **Figure 4.7-3**). The proposed project could have four or five detention ponds, depending on the needs of future development. The basins are proposed as the method of controlling peak discharges for the developed runoff from the site.

FIGURE 4.7-2

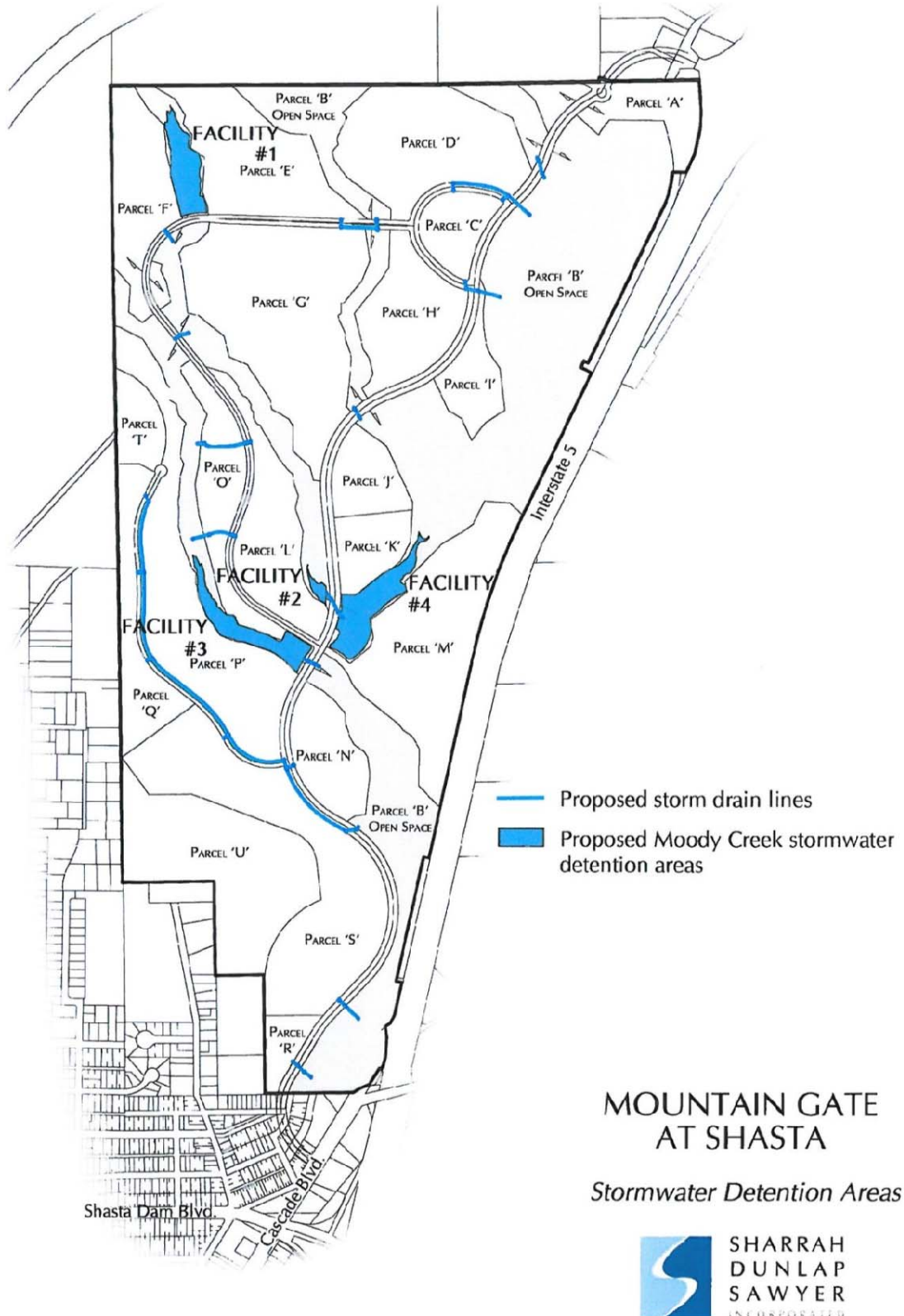
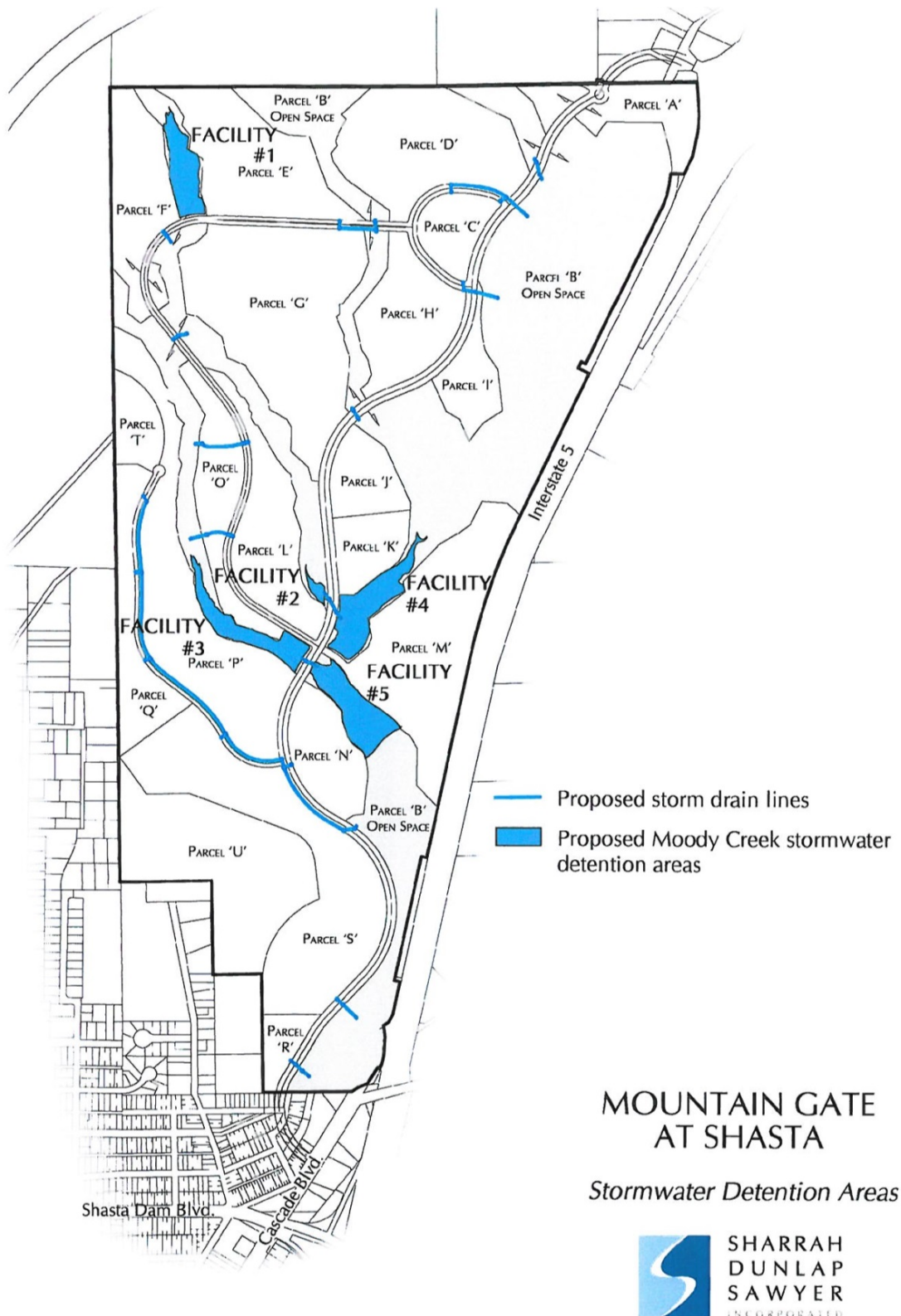


FIGURE 4.7-3



The first detention basin, known as Detention Facility No. 1, is proposed to be located in the western portion of Phase I. This detention basin would have a capacity of ± 27 acre-feet of stormwater. Detention Facility No. 2 would be located south of Facility No. 1 in Phase II and would have a stormwater capacity of ± 6 acre-feet. A third facility, Detention Facility No. 3, would have a capacity of ± 24 acre-feet and be located south of Facility No. 2 in Phase III. Detention Facility No. 4 would be located northeast of Facility No. 3 in Phase III and would have a capacity of ± 25 acre-feet. Detention facility No. 5 is an optional basin located south of facility No. 4. This basin, if utilized, would have a capacity of 15 acre-feet.

The basins are located within the natural drainages and use the proposed road crossings as the means of detaining water. The culvert(s) under the proposed crossings will be sized in accordance with the final storm drainage plan to ensure that post-project peak stormwater flows will not exceed pre-project peak stormwater flows. Drainage alternative 1, shown in **Table 4.7-2**, would result in a total capacity of 82 acre-feet. Adding another basin, as shown in **Table 4.7-3**, both increases the amount of storage to 87 acre-feet and allows drainage basin 4 to be reduced in size/capacity from 25 to 15 acre-feet. The basins will temporarily store the stormwater generated by the new impervious surfaces within the proposed project, ensuring that the peak stormwater flows are not increased. Further, the storage and the associated culverts will slow the stormwater, which will reduce the potential for erosion.

Pre- and post-construction peaks for each detention facility are noted in **Tables 4.7-2** and **4.7-3**.

TABLE 4.7-2
PEAK FLOW DISCHARGE SUMMARY – ALTERNATIVE NUMBER 1
MOUNTAIN GATE AT SHASTA AREA PLAN – FOUR BASINS

Proposed Stormwater Detention Facility No.	Facility Surface Area Size	Volume (acre-feet)	100-Year Flow In		100-Year Flow Out	
			Pre-Construction (cfs)	Post-Construction (cfs)	Pre-Construction (cfs)	Post-Construction (cfs)
1	~ 4 ac	+ 27	784	820	793	802
2	~ 1.5 ac	+ 6	811	607	833	602
3	~ 4.5 ac	+ 24	1,370	1,402	1,396	1,284
4	~ 5 ac	+ 25	1,830	1,561	1,857	1,556

Source: Sharrah Dunlap Sawyer 2013

4.7 HYDROLOGY AND WATER QUALITY

TABLE 4.7-3
PEAK FLOW DISCHARGE SUMMARY – ALTERNATIVE NUMBER 2
MOUNTAIN GATE AT SHASTA AREA PLAN – FIVE BASINS

Proposed Stormwater Detention Facility No.	Facility Surface Area Size	Volume (acre-feet)	100-Year Flow In		100-Year Flow Out	
			Pre-Construction (cfs)	Post-Construction (cfs)	Pre-Construction (cfs)	Post-Construction (cfs)
1	~ 4 ac	+ 27	784	820	793	802
2	~ 1.5 ac	+ 6	811	607	833	602
3	~ 4.5 ac	+ 24	1,370	1,402	1,396	1,284
4	~ 4 ac	+ 15	1,830	1,561	1,857	1,558
5	~ 4.5 ac	+ 15	3,227	2,755	3,229	2,718

Source: Sharrah Dunlap Sawyer 2013

Mitigation Measures

MM 4.7.4 The final site drainage plan shall include detention basins designed to store and attenuate stormwater runoff as shown in **Figure 4.7-2**. Each of the detention basins shall have restricted outlets that will “calm” the velocity of runoff rates of storm events on the upstream side of the restricted outlets and provide for settlement of sediments. Also, the final site drainage plan shall include adequate provisions for erosion control at points of discharge for runoff generated within development areas.

Timing/Implementation: Prior to approval of grading permits and/or improvement plans

Enforcement/Monitoring: City of Shasta Lake Public Works Department

Implementation of mitigation measure **MM 4.7.4** will reduce impacts associated with post-project storm drainage rates and amounts as a result of the proposed project to a level that is **less than significant**.

Create or Contribute Runoff Exceeding the Capacity of Existing Drainage Systems (Standard of Significance 5)

Impact 4.7.5 Implementation of the project at buildout would increase the amount of impervious surfaces and increase drainage rates and runoff over existing conditions. This will result in a **potentially significant** impact to drainage capacity.

As previously stated, the project would involve several improvements, including new roads and modifications to existing roadways, residential, commercial, and mixed-use development, parks, and open space. The associated development would increase the amount of impervious surfaces on the project site, which could impact drainage conditions both on- and off-site.

Drainage would be accommodated on-site through stormwater infrastructure, such as storm drains, culverts, and open drainage channels. Detention facilities such as those described under mitigation measure **MM 4.7.4** are proposed as a method to mitigate peak discharges for the developed runoff from the site. Mitigation measure **MM 4.7.2e** would also assist in reducing this potential impact by requiring a final drainage plan that includes all appropriate calculations, a watershed map, changes in downstream flows and flood elevations, proposed on- and off-site improvements, features to protect downstream uses and property, and drainage easements to accommodate downstream flows from this project.

In addition, the Mountain Gate at Shasta Area Plan contains policies relating to storm drainage that will mitigate the project's impact. Area Plan Policy 3.8, Storm Drainage, states that implementation of the master drainage system for the Area Plan area as buildout occurs would be constructed only as approved by the City and that the drainage system would be expanded in accordance with prevailing City policies and standards to serve the Area Plan area. Additionally, the project would be required to comply with the requirements of the City of Shasta Lake Floodplain Management Ordinance and General Plan policies.

The following mitigation is required to ensure that the necessary on-site stormwater infrastructure is constructed to an acceptable level of operation.

Mitigation Measures

Implement mitigation measures **MM 4.7.2e** and **MM 4.7.4**.

MM 4.7.5 The project applicant shall provide to the City a final set of proposed improvement plans and calculations accepted by the City including but not limited to the following:

- Quantification of anticipated runoff rates during appropriate design storms.
- A comprehensive storm drain system design, including inlets, outlets, conveyance systems, and detention systems.
- Appropriate pipe sizing to accommodate design storm flows and sizing of stormwater detention facilities.
- Identification of pipe sizing, pipe location, and the location of the inlet and outlet structures.

Timing/Implementation: Prior to approval of a grading permit and/or improvement plans

Enforcement/Monitoring: City of Shasta Lake Development Services Department; City of Shasta Lake Department of Public Works; Central Valley Regional Water Quality Control Board

Implementation of mitigation measures **MM 4.7.2e**, **MM 4.7.4**, and **MM 4.7.5** would ensure that the proposed on-site stormwater infrastructure is constructed to the level of operation described in **Table 4.7-2** above. This impact would be reduced to **less than significant**.

4.7 HYDROLOGY AND WATER QUALITY

Place Housing or Other Structures within a 100-Year Flood Hazard Area (Standards of Significance 7 and 8)

Impact 4.7.6 Development of the proposed project will not place housing or other types of structures within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map. This impact is considered to be **less than significant**.

The Mountain Gate at Shasta Area Plan contains 73.7 acres within a designated floodplain. According to Flood Insurance Rate Map (FIRM) Community-Panel Numbers 060758-1236G, 060758-1228G, and 060758-1229G published by FEMA for the City of Shasta Lake, most of the project site is located in Zone X, which is a designation for areas of minimal flooding. As shown on **Figure 3.0-3**, the project has been designed to avoid development within a 100-year flood hazard area to minimize impacts from flooding and would not be affected by any off-site sources of flooding.

Mitigation Measures

None required.

Expose People or Structures to Seiche, Tsunami, Mudflow, or Dam or Levee Failure Inundation (Standards of Significance 9 and 10)

Impact 4.7.7 The proposed project is not expected to expose people or structures to a significant risk of loss, injury, or death involving flooding, including flooding as a result of the failure of a levee or dam, nor will the project expose people or structures to a hazard of inundation by seiche, tsunami, or mudflow. This impact is considered to be **less than significant**.

The proposed project is not located in an area that is subject to seiches or tsunamis, and the project would not expose people or structures to any such impacts.

Shasta Dam is located approximately 6 miles upstream, north of the project site, and is separated from the project site by a series of hills and ridges (ENGEO 2005). According to the geologic and geotechnical reconnaissance report (ENGEO 2005; **Appendix 4.8-1**), it is unlikely that a wave from Shasta Lake would directly impact the site. The dam is of sufficient height and capacity to be regulated by the California Division of Safety of Dams (DSD). The DSD performs annual maintenance inspections of this and other dams under state jurisdiction, including monitoring for compliance with seismic stability standards. Regular inspection by the DSD ensures that the dam is kept in safe operating condition. As such, failure of this dam is considered to have an extremely low probability of occurring and is not considered to be a reasonably foreseeable event.

With regard to mudflows, the project site slopes gently from north to south with little topographic relief. A total of 17.6 acres of the project site has slopes in excess of 30 percent. Further, given the lack of any geologic features in the vicinity of the project area that are prone to mudflows, such as volcanoes or destabilized slopes, mudflows are an extremely unlikely occurrence. Additionally, Chapter 15.08 of the City's Municipal Code requires that a geotechnical report be prepared for all future development under the proposed Area Plan. Such reports would identify any geologic hazards in the project area, including mudflow hazards.

This impact is **less than significant**.

Mitigation Measures

None required.

4.7.4 CUMULATIVE SETTING, IMPACTS, AND MITIGATION MEASURES

CUMULATIVE SETTING

The cumulative setting for impacts related to hydrology and water quality includes the Sacramento River Hydrologic Region. This drainage basin is approximately 27,200 square miles in size and encompasses the project site. In addition to the proposed project, several other developments have been approved, are planned, or are proposed in the Shasta County region that could cumulatively affect hydrologic conditions and water quality.

CUMULATIVE IMPACTS AND MITIGATION MEASURES

Cumulative Drainage and Flooding Impacts

Impact 4.7.8 The proposed project, in combination with planned and proposed development in the City of Shasta Lake, would alter drainage conditions and rates, which could result in potential flooding impacts. This is considered a **less than cumulatively considerable** impact.

Cumulative conditions would increase impervious surfaces and would alter drainage conditions and rates in the City of Shasta Lake. Planned development in the region would increase impervious surfaces and would alter drainage conditions and rates. Development potential in the project vicinity is identified in Section 6.0 of this Draft EIR.

Although flooding is not a major concern for the existing site, implementation of the Mountain Gate at Shasta Area Plan would result in the compaction and paving over of natural soils that have a substantially lower permeability than soils left in their natural state. There would also be an increase in the volume of surface runoff due to the impervious materials, including rooftops, concrete sidewalks, and asphalt roadways and parking lots, which would increase the volume of surface runoff. As noted in Impact 4.7.4, any surface runoff associated with the implementation of the proposed project would be contained before affecting the water quality and downstream flood control facilities. Detention ponds, sediment and grease traps, or an underground storm drainage system are required to be implemented.

As noted under Impact 4.7.4, the proposed project would not result in an increase in drainage flows during 100-year storm conditions.

Mitigation Measures

Implementation of mitigation measures **MM 4.7.2e**, **MM 4.7.4**, and **MM 4.7.5** would ensure that the project's contribution to increases to drainage and flooding would not result in new or increased severity of flooding, which would ensure that this impact is **less than cumulatively considerable**.

Cumulative Water Quality Impacts

Impact 4.7.9 The proposed project, in combination with planned and proposed development in the City of Shasta Lake, would contribute to potential

4.7 HYDROLOGY AND WATER QUALITY

impacts to surface water and groundwater quality from construction and operation activities. This is considered to be a **less than cumulatively considerable** impact.

Drainage and soil disturbance associated with the construction and operational activities of the Area Plan, under cumulative conditions in the City of Shasta Lake and the region, may contribute to water quality impacts when considered with other development projects in the region. Runoff would typically contain oils, grease, fuel, antifreeze, byproducts of combustion (such as lead, cadmium, nickel, and other metals), nutrients, sediment, and other pollutants. Any surface runoff associated with the implementation of the proposed project would be contained before affecting the water quality and downstream flood control facilities. Detention ponds, sediment and grease traps, or an underground storm drainage system are required to be implemented to mitigate these potential impacts. Further, implementation of mitigation measures **MM 4.7.2a** through **MM 4.7.2e** would reduce the project's contribution to cumulative water quality impacts to **less than cumulatively considerable** by requiring the use of best management practices and compliance with applicable regional, state, and federal water quality standards.

Mitigation Measures

Implementation of mitigation measures **MM 4.7.2a** through **4.7.2e**.

REFERENCES

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- SWRCB (State Water Resources Control Board). 2009. *Construction General Permit Fact Sheet*. http://www.waterboards.ca.gov/water_issues/programs/stormwater/docs/constpermits/wqo_2009_0009_factsheet.pdf.
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4.8 GEOLOGY AND SOILS

This section describes the geology of the project site and surrounding vicinity and analyzes issues such as potential exposure of people and future improvements to geologic hazards, alterations to terrain, and erosion. It also discusses the types of soil that have been identified on the site and their properties as they relate to the proposed project. In addition, potential geologic and seismic hazards such as earthquakes and landslides are discussed. This section is based on the Preliminary Geotechnical Report, Mountain Gate at Shasta Lake, prepared by CGi Technical Services, Inc., (2011), included as **Appendix 4.8-1** and the Geologic and Geotechnical Reconnaissance Report prepared by Engeo Incorporated (2005), included as **Appendix 4.8-2**. Included as **Exhibit 4.8-3** is the Environmental Site Assessment prepared by Environmental Safety Services in 2005.

4.8.1 EXISTING SETTING

The project site is located in the northernmost tip of California's Great Valley Province. To the north and west is the Klamath Mountain Province and to the east is the Cascade Range Province. The Shasta Dam Reservoir and the Shasta National Forest are located north of the project site.

TOPOGRAPHY AND LOCAL GEOLOGY

Topography

The topography of the site varies, with site grades ranging from approximately 800 to 950 feet (above mean sea level) in elevation. Terrain consists of mountain meadowland, surrounded by steep hill terrain to the north, west, and across Interstate 5 (I-5) to the east. Three-quarters of the property slopes gently from north to south with little topographic relief (see **Figure 4.8-1**). The southern quarter of the property and small portions of the western boundary have steep-dipping hills with up to 150 feet of relief. A total of 17.6 acres of the project site has slopes in excess of 30 percent. The development is underlain by relatively flat to relatively steeply inclined slopes with inclinations ranging from about 3 to at least 30 degrees.

Site Features

The areas of the project site where hills are present are densely vegetated and covered with trees, while only scattered trees are located in the gently sloping level areas of the site. Areas along the eastern and central portions of the property have abundant tall grasses and muddy water-saturated soils. Many of these muddy areas are deeply rutted with tire marks, where vehicle traffic has attempted to drive through them.

Three southerly-flowing drainages traverse the meadow portion of the property. The easternmost and the central drainages are shown on the US Geological Survey (USGS) topographic map as Rancheria Creek and the westernmost as Moody Creek (see **Figure 4.7-1**). These drainages display a meandering style of geomorphology and are incised at a depth of 1 to 3 feet in some areas. Moody Creek and both branches of Rancheria Creek are generally vegetated with dense trees and seasonal plants (see **Photo 4.7-1** in Section 4.7, Hydrology and Water Quality).

Several dirt roads provide access to the property. One of these roads leads to an abandoned farmstead in the northeastern portion of the property at the top of a small hill. Although the farmstead has been abandoned for several years, perimeter concrete footings for the raised floor structure and small areas of concrete assumed to be remnants of sidewalk and patio areas still exist, and a dilapidated corral is located northwest of the main structure. None of the farmstead buildings are currently intact, and a pile of rubble and rotting lumber is all that remains.

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Geology

Engeo prepared a Geologic and Geotechnical Reconnaissance Report in August 2005. The report was based on geotechnical field investigation to evaluate subsurface soil conditions and to provide preliminary subsurface data for evaluation of the feasibility of future development. In 2011, CGI prepared a Preliminary Geotechnical Report, which included the same analysis as the Engeo investigation but also included subsurface exploration through excavation of nine backhoe test pits and chemical analysis of the soil.

According to the soil survey map for the project region (Klaseen and Ellison, 1974), the property is underlain by various soil types. Most of the soil units are fine-grained soils (clayey or silty) that can also contain a relatively large gravel fraction. These soils have a plasticity index ranging from non-plastic (NP) to 30, which are indicative of soils that have a very low to high expansion potential (Day, 1999). The soils are reported to have a very low to high shrink-swell potential.

Based on the test pits analyzed by CGI, on-site, subsurface materials consist predominately of sandy to silty clay overlaying gravelly to sandy clay or metavolcanic bedrock composed of the Devonian-age Copley Greenstone (Dupras, 1977). The Copley Greenstone ranges in consistency from stiff clay to a slightly friable rock near the surface and grades to a strong to very strong rock at depth. The rock is highly fractured and has a structural fabric consisting of closely spaced joints that are laterally continuous. Artificial fill was observed at localized areas. This fill appears to be thin (less than five feet) and consists mainly of road prism to provide access to the property and surrounding areas.

Groundwater

Groundwater was encountered only within test pit TP-9 at approximately 7 feet below the ground surface (CGI 2011). Depth to groundwater can vary throughout the year and from year to year. Intense and long duration precipitation, modification of topography, and cultural land uses, such as irrigation, water well usage, on-site waste disposal systems, and water diversions, can contribute to fluctuations in groundwater levels. Localized saturated conditions or perched groundwater conditions near the ground surface should be anticipated during and following periods of heavy precipitation and snowmelt (CGI 2011).

Soils and Mineral Resources

The Geologic Map of California, Redding Sheet (1:250,000) shows the presence of Pleistocene non-marine sediments and Devonian and pre-Devonian metavolcanic rocks (North Fork Associates 2006). The Soil Survey of Shasta County Area, California, prepared by the US Department of Agriculture (1974), indicates that the site is underlain by an Auburn-Gouldin-Neuns association: nearly level to very steep, well-drained gravelly loams and clay loams and very gravelly silt clay loams underlain by partly metamorphosed volcanic rocks; non-stony to very stony on the surface. According to the Biological Resource Assessment prepared by North Fork Associates (2006), eleven soil units have been identified and mapped on the site (see **Figure 4.8-2**). The primary examples of these soils and their physical characteristics are summarized in **Table 4.8-1**. In general, they are at shallow to moderate depths, well drained, medium textured, and non-expansive with a low to medium shrink-swell potential.

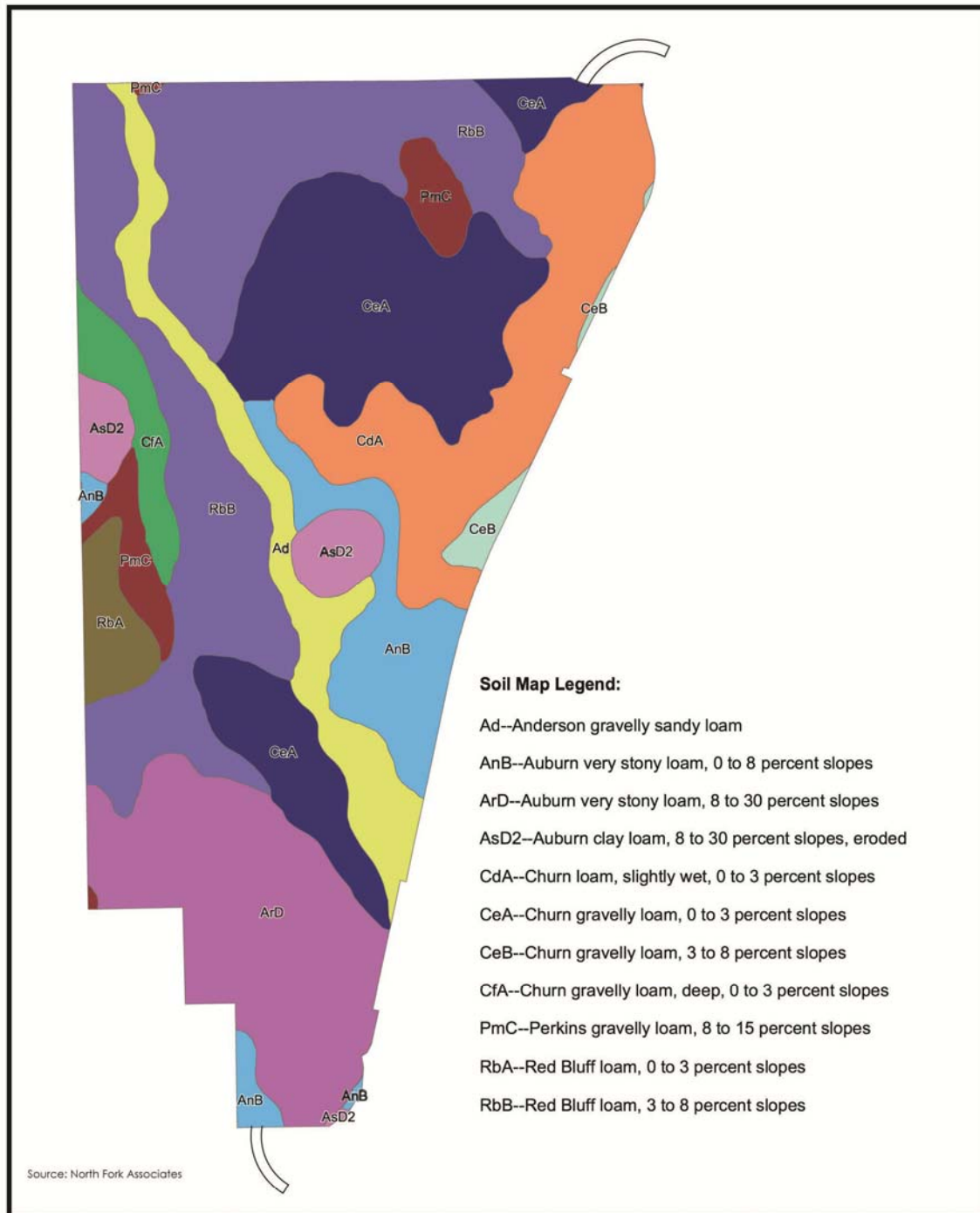


PREPARED BY:
SHARRAH DUNLAP SAWYER, INC.

Figure 4.8-1
Topographic Conditions
Mountain Gate at Shasta

PMC

4.8 GEOLOGY AND SOILS



NOT TO SCALE

Figure 4.8-2
Soil Types
Mountain Gate at Shasta
PMC

TABLE 4.8-1
SOIL PHYSICAL CHARACTERISTICS

Soil Type	Drainage	Permeability	Runoff	Water Erosion Hazard	Shrink-Swell
Anderson gravelly sandy loam (Ad)**	Somewhat excessive	Rapid	Slow	None to slight	Low
Auburn loam, 0 to 8 percent slopes (AnB)**	Well drained	Moderate	Slow	Slight to moderate	Low
Auburn very stony loam, 8 to 30 percent slopes (ArD)	Well drained	Moderate	Medium – rapid	Moderate to high	Low
Auburn clay loam, 8 to 30 percent slopes, eroded (AsD2)	Well drained	Moderate	Medium to rapid	Moderate to high	Low
Churn gravelly loam, deep, 0 to 3 percent slopes (CfA)*	Moderately well drained	Slow	Slow	None to slight	Low
Churn loam, slightly wet, 0 to 3 percent slopes (CdA)*	Moderately well drained	Moderately slow	Very slowly	None to slight	Moderate
Churn gravelly loam, 0 to 3 percent slopes (CeA)*	Well drained	Moderately slow	Slow	None to slight	Low
Churn gravelly loam, 3 to 8 percent slopes (CeB)*	Moderately well drained	Moderately slow	Slow to medium	Slight to moderate	Low
Perkins gravelly loam, 8 to 15 percent slopes (PmC)	Well drained	Slow	Medium	Moderate	Low to moderate
Red Bluff loam, 0 to 3 percent slopes (RbA)*	Well drained	Moderately slow	Slow	None to slight	Low
Red Bluff loam, 3 to 8 percent slopes (RbB)*	Well drained	Moderately slow	Slow to medium	Slight to moderate	Low to moderate

Source: USDA 1974; California Department of Conservation 1974

* Prime lands

** Statewide lands

Anderson soils consist of loamy-skeletal, mixed, active, nonacid, thermic Typic Xerofluvents. They are somewhat excessively drained soils that formed in recent alluvium from mixed sources. A representative surface layer is brown, medium acid gravelly sandy loam about 14 inches thick. In places, these soils are subject to flooding for short periods during winter.

Auburn soils are loamy and usually well drained with moderate permeability. The A horizon is roughly 9 inches deep, and the B horizon is about 9 to 14 inches deep. Small mottles may occur in the upper portion of the profile of this primarily upland soil. Bedrock usually occurs at 14 to 24 inches.

Churn soils consist of fine-loamy, mixed, superactive, thermic Ultic Haploxeralfs. They are well drained and moderately well drained soils that formed in alluvium from mixed sources. Churn soils have a shallow A horizon, usually up to 9 inches below the surface, underlain by a dense clay layer.

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Perkins soils consist of fine-loamy, mixed superactive, thermic Mollic Haploxeralfs. They are very deep, well drained soils that formed in alluvium derived from mixed rock sources. Perkins soils are on terraces and have slopes of 0 to 30 percent.

Red Bluff soils consist of fine, kaolinitic, thermic Ultic Palexeralfs. They are well drained and moderately well drained soils. Red Bluff soils are on terraces and have 0 to 9 percent slopes. The A horizon ranges from 6 to 15 inches, brown to yellowish red in color, underlain by clay to heavy clay loam.

FAULTING AND SEISMIC HAZARDS

Earthquakes

An earthquake is the release of stored energy in the earth due to sudden movement along a geologic fault. This energy release can result in ground shaking of the earth's surfaces. Earthquakes can also be associated with volcanic activity. Because Northern California has a long history of faulting and associated earthquakes, the project area is considered to lie within a seismically active region. However, the California Geological Survey (CGS) (2007) does not list lands of Shasta County as being located within a currently designated Earthquake Fault Hazard Zone.

According to the preliminary geotechnical report (CGI, 2011), no known active faults are located within the property boundaries, nor are any known surface expressions of active faults believed to exist within the site. The closest known faults classified as active by the California Geological Survey are the Battle Creek fault, which is located approximately 21 miles southeast of the project area, and the Little Salmon fault, which is located approximately 80 miles west of the project area.

The Little Salmon fault has an estimated moment magnitude of 7.0, and the Battle Creek fault has an estimated moment magnitude of 6.5. Both faults could produce peak site ground accelerations at the site of 0.08g and 0.14g, respectively ("g" = the acceleration due to the earth's gravity, equivalent to g-force).

The intensity scale consists of a series of certain key responses such as people awakening, movement of furniture, damage to chimneys, and finally total destruction. Although numerous intensity scales have been developed over the last several hundred years to evaluate the effects of earthquakes, the one currently used in the United States is the Modified Mercalli Intensity (MMI) Scale. This scale is composed of 12 increasing levels of intensity that range from imperceptible shaking to catastrophic destruction. The higher numbers of the scale are based on observed structural damage.

TABLE 4.8-2
MODIFIED MERCALLI INTENSITY SCALE FOR EARTHQUAKES

Mw	Modified Mercalli Scale	Effects of Intensity
1.0–3.0	I	I. Not felt except by a very few under especially favorable conditions.
3.0–3.9	II–III	II. Felt only by a few persons at rest, especially on upper floors of buildings. Delicately suspended objects may swing. III. Felt quite noticeably by persons indoors, especially on upper floors of buildings. Many people do not recognize it as an earthquake. Standing motor cars may rock slightly. Vibrations similar to the passing of a truck. Duration estimated.
4.0–4.9	IV–V	IV. Felt indoors by many, outdoors by few during the day. At night, some awakened. Dishes, windows, doors disturbed; walls make cracking sound. Sensation like heavy truck striking building. Standing motor cars rocked noticeably. 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.
5.0–5.9	VI–VII	VI. Felt by all, many frightened. Some heavy furniture moved; a few instances of fallen plaster. Damage slight. VII. Everybody runs outdoors. Damage negligible in building 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.
6.0–6.9	VIII–IX	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. 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.
7.0 and higher	X or higher	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. 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. 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.

Source: CGS 2002

4.8 GEOLOGY AND SOILS

By comparison, magnitude is based on the amplitude of the earthquake waves recorded on instruments that have a common calibration. The magnitude or strength of earth movement associated with seismic activity is typically quantified using the Richter scale. This scale is a measure of the strength of an earthquake or strain energy released by it, as determined by seismographic observations.

Though low to moderate in intensity, seismic hazards could potentially impact the project area, including ground shaking and ground failure.

Ground Failure

The various processes grouped within ground failure include on- or off-site lateral spreading, liquefaction, landslides, and subsidence. Each of these occurrences involves a displacement of the ground surface due to loss of strength or failure of the underlying materials during earthquake shaking.

Lateral Spreading

Lateral spreading typically occurs as a form of horizontal displacement of relatively flat-lying alluvial material toward an open or “free” face, such as an open body of water, channel, or excavation. In Shasta County, the hazard from lateral spreading and slump-type failures is expected only around the edge of alluvial terraces and along the floodplain of the Sacramento River. Generally in soils, this movement is due to failure along a weak plane, and may often be associated with liquefaction. As cracks develop within the weakened material, blocks of soil displace laterally toward the open face. Cracking and lateral movement may gradually propagate away from the face as blocks continue to break free. Generally, failure in this mode is analytically unpredictable, since it is difficult to determine where the first tension crack will occur (ENGEO 2005).

The previously discussed incised creeks at the project site are small and are located in proposed park areas. There are no cliff faces or large deeply incised or open bodies of water within an appropriate distance for lateral spreading to occur on the site.

Liquefaction

Liquefaction is described as the sudden loss of soil shear strength due to a rapid increase of soil pore water pressures caused by cyclic loading from a seismic event. In simple terms, it means that a liquefied soil acts more like a fluid than a solid when shaken during an earthquake. In order for liquefaction to occur, the following are needed:

- Granular soils (sand, silty sand, sandy silt, and some gravels);
- A high groundwater table; and
- A low-density in the granular soils underlying the site.

Based on the CGi investigations, the site appears to be underlain by predominately fine-grained soils or lithified rock that are estimated to have a low potential for liquefaction, except possibly in the immediate proximity of drainages located on site. Those drainages could hold loose, saturated alluvium soils that might liquefy when exposed to strong ground motion. If buffer zones are established around drainages on site (100-year flood plain), then liquefaction should not adversely affect the project development (CGi, 2011)

Landslides

Landslides are defined as the movement of soil or rock down a slope due to the influence of gravity. Although landslides occur throughout Shasta County, they have not been considered a major problem. Landslides are more prevalent in the eastern and northern portions of Shasta County and are commonly related to the sedimentary and volcanic rocks in these vicinities.

The project site is relatively flat to moderately inclined across the property with localized steep slopes. In general, the northern three-quarters of the property is relatively flat with the exception of localized mounds, and the southern quarter of the property has generally increasingly steep terrain. No visible signs of landslides are evident from site observations. In its present condition, it is the opinion of CGI that there is a low potential for landsliding to occur at the site (CGI, 2011)

Subsidence

Subsidence is the downward movement of the land surface caused by a reduction in hydrostatic pressure in thick geologic units. Subsidence is associated with the extraction of oil, gas, or groundwater from below the ground surface, resulting in loss in volume, but may also occur as a result of an earthquake.

Soil Chemistry

As stated in CGI's Report, a selected sample of the near-surface soil encountered at the site was subjected to chemical analysis for the purpose of assessment of corrosion and reactivity with concrete. The sample was tested for pH, soluble sulfates, chlorides and resistivity.

According to the American Concrete Institute (ACI) Code 318, a sulfate concentration below 0.10 percent by weight (1,000 parts per million [ppm]) is negligible. A chloride content of less than 500 ppm is generally considered non-corrosive to reinforced concrete. Therefore, the testing indicated the soils were non-corrosive as shown below. However, because of the size of the project site, further testing of soil chemistry will be performed during future geotechnical studies for this project.

Soil Chemistry Results					
Sample	Sample Depth	pH	Sulfates (ppm)	Chlorides (ppm)	Resistivity (ohm-cm)
TP-4	1-3'	6.4	6.3	1.0	19,200

Non-Seismic Geologic Hazards

Non-seismic geologic hazards include volcanic eruptions, seiches, expansive soils, and erosion.

Volcanic Eruption

Shasta County is located near the Cascade Range, which has documented volcanic activity. The Map of Potential Hazards from Future Volcanic Eruptions in California maps all of Shasta County in an area of potential hazard from future volcanic eruption. The Map of Major West Coast Volcanoes, Washington, Oregon, and California maps Medicine Lake and Mount Shasta to the northwest and Lassen Park to the southwest as potential sources for volcanic eruption. The USGS website does not show the project site or the Shasta Lake area as areas that would be

4.8 GEOLOGY AND SOILS

affected by any lava or pyroclastic flows. The area may receive some ash fall, depending on the direction of prevailing winds at the time of a potential volcanic eruption, from these volcanic sources.

Expansive Soils

Expansive soils swell when wet and shrink as they dry. Expansive soils generally contain mixed-layer clays, known as smectite, that expand when moisture is absorbed into the crystal structure, resulting in a rise in the ground surface. Most of Shasta County is characterized by moderately expansive soils. Though expansive soils are not considered to pose a significant hazard in the City of Shasta Lake area, standard soil tests are necessary in order to determine the expansive soil potential for a particular area.

It is anticipated that moderately to slightly weathered rock materials of the Copley Greenstone will have a very low to low expansion potential. Those rock materials underlie most of the surficial soils covering the project site (CGi, 2011). The effects of expansive soils on structures can be mitigated through proper engineering design and standard corrective measures.

Soil Erosion

Erosion is a normal and inevitable geologic process generally involving the removal of earth materials from one area with deposition to another area. Examples of concentrated erosion include gullied land surface and undercut stream banks. Expansive erosion includes sheetwash and slope denudation. Excessive erosion causes sedimentation and can damage or destroy waterway and riparian habitat and can clog drainage structures, lakes, reservoirs, and floodplains. Site grading activities and improvements, such as paved streets, can have an impact on erosion potential at the site. The impact of soil erosion is significant without mitigation. Erosion and sediment control require implementation of measures before, during, and after grading activities. By implementing a stormwater pollution prevention plan and best management practices, the areas of exposed, erodible material can be minimized and the concentration of rapidly flowing runoff in unprotected, erodible areas can be avoided.

Subsurface Gases

According to a review of the California Department of Oil, Gas and Geothermal Resources (DOGGR) website, there are no occurrences of geothermal activity mapped within the site (ENGEO 2005). The closest geothermal activity, as mapped on the Geothermal Map of California, is approximately 30 miles to the northeast and southeast in the Big Bend and Lassen areas, respectively (ENGEO 2005).

Review of the California DOGGR website additionally indicates that there are no mapped occurrences of oil or gas within the site (ENGEO 2005). The closest gas field, as shown on the Map of Oil, Gas, and Geothermal Fields of California, is approximately 30 miles to the south, in the abandoned Red Bank Creek field (ENGEO 2005).

Fibrous (Asbestiform) Minerals

Asbestos is a term given to naturally occurring fibrous minerals that possess unique flexibility with heat-resistant and high tensile strength properties. Due to its fibrous occurrence, asbestos was a commonly used heat insulator until the 1970s, when it was discovered to be carcinogenic via

long-term respiration of airborne fibers. Although no longer used as an industrial material, it remains in certain natural environments and, when highly disturbed, can become airborne.

The presence of ultramafic rocks in the region surrounding the site indicates the possibility of naturally occurring asbestos materials. Ultramafic rocks that are associated with shear zones are considerably denser than other rock formations in the area and many are serpentinized.

To prevent the spread of asbestos-related diseases, new state regulations have been enacted regarding the identification and mitigation of naturally occurring asbestos. Asbestos Airborne Toxic Control Measure (ATCM) Section 93105 regulations apply to any project where serpentinite or ultramafic rock is encountered in the course of grading or construction, or to any property within a mapped serpentinite or ultramafic geologic unit on the California 1:250,000 scale geologic maps (ENGEO 2005).

The project site is not mapped within one of these zones on the Geologic Map of California, Redding Sheet. According to the geological and geotechnical reconnaissance report prepared for this project, it is highly unlikely that serpentinite or ultramafic rocks are present within the proposed project or that significant amounts of naturally occurring asbestos exist (ENGEO 2005).

Radon Potential

Radon isotope-222 is a colorless, odorless, tasteless radioactive gas that is a natural decay product of uranium. Uranium and radon are present in varying amounts in rocks and soil, and radon is present in background concentrations in the atmosphere. Current evidence indicates that increased lung cancer risk is directly related to radon-decay products. The US Environmental Protection Agency (EPA) has recommended an “action” level for indoor radon concentrations at or exceeding 4 picocuries per liter (pCi/l) of air. California ranks as the third lowest for percentage of homes exceeding 4 pCi/l. The EPA uses three zone designations in order to reflect the average short-term radon measurement that can be expected in a building without the implementation of radon control methods. The radon zone designation of the highest priority is Zone 1. According to the EPA Map of Radon Zones, Shasta County is in Zone 3 (EPA 2012).

Specific indoor radon information can only be obtained through a sampling and testing program for the future structures. However, based on the soil composition and topography of the project site and the lack of existing on-site structures, the potential for radon concentrations exceeding 4 pCi/l is anticipated to be very low. According to the environmental site assessment prepared for the project (ESS 2005), radon is not considered to be an issue for the project site.

4.8.2 REGULATORY FRAMEWORK

STATE

Alquist-Priolo Earthquake Fault Zoning Act

The Alquist-Priolo Earthquake Fault Zoning Act was passed in 1972 (originally enacted as the Alquist-Priolo Special Studies Zones Act and renamed in 1994) and is intended to reduce the risk to life and property from surface fault rupture during earthquakes. The main purpose of the law is to prevent the construction of buildings used for human occupancy on the surface trace of active faults. There are no earthquake fault zones subject to the Alquist-Priolo Earthquake Fault Zoning Act in the area of the project site (CGS 2007).

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Seismic Hazards Mapping Act

The Seismic Hazards Mapping Act addresses non-surface fault rupture earthquake hazards, including liquefaction and seismically induced landslides. Passed by the California Legislature in 1990, this law was codified in the California Public Resources Code as Division 2, Chapter 7.8A, and became operative in April 1991. The Seismic Hazards Mapping Act resulted in a mapping program that is intended to reflect areas which have the potential for liquefaction, landslide, strong ground shaking, or other earthquake and geologic hazards. There are no areas on the project site subject to the Seismic Hazard Mapping Act (CGS 2006).

California Building Standards Code

The State of California provides minimum standards for building design through the California Building Standards Code (CBSC) (California Code of Regulations, Title 24). The CBSC is based on the Uniform Building Code (UBC), which is used widely throughout the United States (generally adopted on a state-by-state or district-by-district basis) and has been modified for conditions in California. State regulations and engineering standards related to geology, soils, and seismic activity are reflected in the CBSC requirements. Through the CBSC, the State of California provides a minimum standard for building design and construction. The CBSC contains specific requirements for seismic safety, excavation, foundations, retaining walls, and site demolition. It also regulates grading activities, including drainage and erosion control.

LOCAL

City of Shasta Lake General Plan

The City of Shasta Lake General Plan identifies specific policies regarding geology and soils. **Table 4.8-3** analyzes the project's consistency with the relevant policies. While this Draft EIR analyzes the project's consistency with the General Plan pursuant to California Environmental Quality Act (CEQA) Section 15125(d), it is the City of Shasta Lake Planning Commission and/or City Council that will make the determination of the project's consistency with the identified General Plan policies.

TABLE 4.8-3
PROJECT CONSISTENCY WITH CITY OF SHASTA LAKE
GENERAL PLAN: SEISMIC SAFETY AND WATER QUALITY

General Plan Objectives & Policies	Consistent with General Plan?	Analysis
Land Use Policies		
LU-r All residential designated lands in excess of 30 percent slope shall not be developed. Development on slopes in excess of 20 percent may be considered subject to additional design requirements as part of a land division map or building permit submission. At a minimum the following shall be provided: comprehensive grading, erosion and landscaping plans; a soils report by a soils engineer with specific recommendations; and a visual impact analysis,	Yes	A soils engineering report is required during the design of the project. A grading plan would be necessary to help ensure the project's design is compatible with the engineering characteristics of underlying soils.

General Plan Objectives & Policies	Consistent with General Plan?	Analysis
depending on the project location.		
Seismic and Geologic Hazards Objectives		
SG-1 Protect development from seismic hazards; and protection of essential or critical structure, such as schools, public meeting facilities, emergency services, high-rise and high density structures, by developing standards appropriate for such protection.	Yes, with mitigation	Per Chapter 15.08 of the City's Municipal Code and mitigation measure MM 4.8.1b, prior to development of the project, a site-specific geotechnical investigation will be prepared, which considers suitability of soils for development. The report will also determine seismic hazard risk and provide measures for avoidance and/or means to reduce these risks based on soil types.
SG-3 Protect development from other geologic hazards, such as landslides, erosion and expansive soils.	Yes, with mitigation	The Preliminary Geotechnical Report by CGI (2011) and Preliminary Geologic and Geotechnical Reconnaissance Report by ENGEO (2005) state that no evidence of slope failure was noted across the property during their investigations. Although this condition was not observed, implementation of mitigation measures in this section would ensure project consistency with this policy.
Seismic and Geologic Hazards Policies		
SG-a Comply with state seismic and building standards in the design and siting for critical facilities, including hospital facilities, police and fire stations, school facilities, hazardous material manufacture and storage facilities, bridges, and large public assembly halls. Require all new buildings in the City be build under the seismic requirements of the currently adopted codes.	Yes	The Uniform Building Code requires buildings to be built to seismic standards (Earthquake Zone 3).
SG-c Sedimentation and erosion from development shall be minimized through ordinances and implementation mechanisms as adopted by the City.	Yes, with mitigation	The Preliminary Geotechnical Report by CGI (2011) and Preliminary Geologic and Geotechnical Reconnaissance Report by ENGEO (2005) state that no evidence of slope failure was noted across the property during their investigation. Although this condition was not observed, implementation of mitigation measures in this section would ensure project consistency with this policy.
SG-d When soil tests reveal the presence of expansive soils, require engineering design measures to eliminate or mitigate their impacts.	Yes	See consistency analysis for Policy LU-r.
Water Quality Policies		
W-a The City shall maintain standards for erosion and sediment control plans for development.	Yes, with mitigation	Implementation of mitigation measure MM 4.8.1a requires a site-specific geotechnical investigation that includes prevention of erosion.

4.8 GEOLOGY AND SOILS

General Plan Objectives & Policies	Consistent with General Plan?	Analysis
W-(5) Require the use of Best Management Practices to control runoff from new development.	Yes, with mitigation	See consistency analysis for Policy W-a.

City of Shasta Lake Grading, Erosion Control, and Hillside Development Ordinance (Municipal Code Chapter 15.08)

Municipal Code Chapter 15.08 is designed to protect life, health, property, the environment, and public welfare by establishing minimum requirements for grading, clearing, and erosion control. This chapter sets forth rules and regulations to control excavation, grading, earthwork construction including fills and embankments, and development on hillsides and along ridgelines; establishes the administrative procedure for issuance of permits; and provides for approval of plans and inspection of grading construction.

Chapter 15.08 requires that all plans and specifications be prepared and signed by a civil engineer or other licensed professional as authorized by the California Business and Professions Code. A registered civil engineer or other licensed professional may also be required to prepare a soils engineering report for proposed projects. If the preliminary soils report indicates the presence of critically expansive soils or other soils problems which, if not corrected, would lead to structural defects, further lot-specific soils investigations may be required. The soils investigation is required to recommend corrective actions that are likely to prevent structural damage to structures proposed to be constructed in the areas where soil problems exist. In practice, specific erosion-control measures are determined upon review of the final subdivision grading plan and are tailored to project-specific grading impacts.

4.8.3 IMPACTS AND MITIGATION MEASURES

STANDARDS OF SIGNIFICANCE

Appendix G of the CEQA Guidelines indicates that a project may have significant impacts on geology and soils if it does any of the following:

- 1) Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death, involving:
 - i) Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault. Refer to California Geological Survey (formerly Division of Mines and Geology) Special Publication 42.
 - ii) Strong seismic ground shaking.
 - iii) Seismic-related ground failure, including liquefaction.
 - iv) Landslides.
- 2) Result in substantial soil erosion or the loss of topsoil.

- 3) Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction, or collapse.
- 4) Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial risks to life or property.
- 5) Have soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems where sewers are not available for the disposal of wastewater.

As determined in the Initial Study prepared for the proposed project, implementation of the proposed project would not result in impacts associated with the exposure of people or structures to potential substantial adverse effects involving rupture of a known earthquake fault as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map, strong seismic ground shaking, seismic-related ground failure including liquefaction, and landslides. The Initial Study also determined that the proposed project would not result in impacts associated with soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems since the project would not employ the use of such. Therefore, these impacts (Standards of Significance 1i through 1iv and 5) will not be addressed further in this Draft EIR.

METHODOLOGY

PMC staff reviewed all project-related information provided by the applicant, as well as geologic maps and information available from Shasta County and the City of Shasta Lake. Evaluation of the potential impacts was based on information obtained from the Shasta County USDA Soil Survey, the Preliminary Geotechnical Report by CGI (2011) Preliminary Geologic and Geotechnical Reconnaissance Report by ENGEO (2005), applicable City of Shasta Lake policies and codes, the Uniform Building Code, as well as field visits. The CGI report is included as **Appendix 4.8-1** to this DEIR. The ENGEO report is included as **Appendix 4.8-2**.

IMPACTS AND MITIGATION MEASURES

Result in Substantial Erosion and Loss of Topsoil (Standard of Significance 2)

Impact 4.8.1 Buildout of the project would require extensive grading and site preparation, which may increase soil erosion and affect slope stability. This impact is considered to be **potentially significant**.

Portions of the project site have a moderate to high potential of erosion based on soil types and sloping. The topography of the project site varies, ranging from approximately 800 to 950 feet (above mean sea level) in elevation. Although the terrain consists primarily of mountain meadowland, it is surrounded by hilly terrain to the north, west, and across I-5 to the east. Estimation of the slopes indicates that portions of the slopes in the southern property could be as steep as 2:1 (horizontal to vertical). A total of 17.6 acres of the project site has slopes in excess of 30 percent. However, project lots and streets have been designed to minimize development on these slopes.

Development of the project would result in soil disturbance and substantial cut and fill to prepare building pads, roads, and utility trenches. Soil erosion rates are determined by soil types, vegetative cover, topography, and slope gradients. Without proper erosion and sediment controls and excavation methods, the project may result in potentially significant slope instability and erosion-related impacts.

4.8 GEOLOGY AND SOILS

As described in Section 4.7, Hydrology and Water Quality, mitigation measure **MM 4.7.2e** requires the project applicant to address storm drainage management during construction and thereafter and to propose best management practice (BMP) measures to reduce erosion, water quality degradation, etc. In addition, mitigation measure **MM 4.7.4** requires that the project's site drainage plan include adequate provisions for erosion control at points of discharge for runoff generated within development areas. The site drainage plan is to include detention ponds to store and attenuate a substantial portion of site stormwater runoff. These detention ponds will have restricted outlets adequate for the majority of storm events and provide for settlement of sediments.

Furthermore, in accordance with the requirements of the Construction General Permit (CGP) (also described in detail in Section 4.7), prior to construction of the proposed project, a risk assessment must be prepared and submitted to the Central Valley Regional Water Quality Control Board (RWQCB) to determine the project's risk level and associated water quality control requirements.

These requirements will, at a minimum, include the preparation and implementation of a stormwater pollution prevention plan (SWPPP), which identifies specific BMPs to be implemented and maintained on the site in order to comply with the applicable narrative effluent standards. The best management practices that must be implemented as part of a SWPPP can be grouped into two major categories: (1) erosion and sediment control BMPs and (2) non-stormwater management and materials management BMPs. Erosion and sediment control BMPs fall into four main subcategories: erosion controls, sediment controls, wind erosion controls, and tracking controls.

Erosion controls include practices to stabilize soil, to protect the soil in its existing location, and to prevent soil particles from migrating. Examples of erosion control BMPs are preserving existing vegetation, mulching, and hydroseeding. Sediment controls are practices to collect soil particles after they have migrated, but before the sediment leaves the site. Examples of sediment control BMPs are street sweeping, fiber rolls, silt fencing, gravel bags, sand bags, storm drain inlet protection, sediment traps, and detention basins.

Wind erosion controls prevent soil particles from leaving the site in the air. Examples of wind erosion control BMPs include applying water or other dust suppressants to exposed soils on the site. Tracking controls prevent sediment from being tracked off-site via vehicles leaving the site to the extent practicable. A stabilized construction entrance not only limits the access points to the construction site, but also functions to partially remove sediment from vehicles prior to leaving the site.

While the above measures would assist in reducing erosion impacts, their primary objective is to prevent sediment from entering project site waterways. The following mitigation measures are expected to further reduce the potential for erosion.

Mitigation Measures

- MM 4.8.1a** The developer shall submit a final grading plan and an Erosion and Sediment Control Plan, prepared by a licensed engineer, to the City of Shasta Lake, pursuant to the specifications of the Grading, Erosion Control, and Hillside Development Ordinance (Chapter 15.08 in the City of Shasta Lake Municipal Code). The plan shall incorporate measures for erosion control as recommended in future geotechnical studies completed to assess design and construction of future project elements.

Timing/Implementation: Prior to approval of subsequent tentative subdivision maps or other discretionary permits, and/or issuance of grading permits.

Enforcement/Monitoring: City of Shasta Lake Development Services Department, City of Shasta Lake Public Works Department

MM 4.8.1b

The developer shall submit an engineered geotechnical report during the design of the project grading plan to ensure compatibility with the engineering characteristics of underlying soils pursuant to Municipal Code Chapter 15.08 and as recommended in the Preliminary Geotechnical Report prepared by CGi (2011). The geotechnical report shall include chemical analysis of soils as recommended by the City Engineer to assess the potential for corrosion and reactivity with concrete. In areas where hillside slopes exceed 30 percent, the layout of proposed improvements, including roadways and structures, shall allow for adjacent usable space to ensure that all cut and fill slopes will not be steeper than 2 feet horizontal to 1 foot vertical.

Timing/Implementation: Prior to approval of subsequent tentative subdivision maps or other discretionary permits, and/or issuance of grading permits.

Enforcement/Monitoring: City of Shasta Lake Development Services Department, City of Shasta Lake Public Works Department

Placement of Structures on Unstable Geologic Unit or Soil – Lateral Spreading (Standard of Significance 3)

Impact 4.8.2 Structures constructed as part of the project may be subject to lateral spreading. This impact is considered **less than significant**.

Lateral spreading typically occurs as a form of horizontal displacement of relatively flat-lying alluvial material toward an open or “free” face, such as an open body of water, channel, or excavation. In Shasta County, the hazard from lateral spreading and slump-type failures is expected only around the edge of alluvial terraces and along the floodplain of the Sacramento River (ENGEO 2005).

The incised creeks at the site are small and are located in proposed park and open space areas. According to the report prepared by ENGEO (2005), there are no cliff faces or large deeply incised or open bodies of water within an appropriate distance from the site for lateral spreading to occur on the project site. For this reason, the probability of lateral spreading occurring at the site during a seismic event is very low. Therefore, the impact is considered to be **less than significant**.

Mitigation Measures

None required.

4.8 GEOLOGY AND SOILS

Placement of Structures on Unstable Geologic Unit or Soil – Liquefaction (Standard of Significance 3)

Impact 4.8.3 The project site may contain a potential liquefaction hazard. This impact is considered **less than significant**.

Liquefaction is described as the sudden loss of soil shear strength due to a rapid increase of soil pore water pressures caused by cyclic loading from a seismic event. A liquefied soil acts more like a fluid than a solid when shaken during an earthquake. In order for liquefaction to occur, the following are needed:

- Granular soils (sand, silty sand, sandy silt, and some gravels);
- A high groundwater table; and
- A low-density in the granular soils underlying the site.

Based on the CGi investigations, the site appears to be underlain by predominately fine-grained soils or lithified rock that are estimated to have a low potential for liquefaction, except possibly in the immediate proximity of drainages located on site. Those drainages could hold loose, saturated alluvium soils that might liquefy when exposed to strong ground motion. If buffer zones are established around drainages on site (100-year flood plain), then liquefaction should not adversely affect the project development (CGi, 2011)

Chapter 15.08 of the City's Municipal Code requires that a geotechnical report be prepared for all future development under the proposed Area Plan. The report is required to be prepared by a registered civil engineer, geotechnical engineer, certified engineering geologist, or other licensed professional as authorized by the California Business and Professions Code and must include an adequate description of the geology of the site, including data regarding the nature, distribution, and strength of existing soils, a detailed subsurface investigation based on test borings, conclusions and recommendations regarding the effect of geologic conditions on the proposed development, conclusions and recommendations for grading procedures, design criteria for corrective measures when necessary, and opinions and recommendations covering adequacy of the site to be developed. The recommendations included in the report are required to be incorporated in the grading plans or specifications.

These requirements, as mandated in Chapter 15.08 of the Municipal Code, would reduce the potential for future residents and structures of the Area Plan to experience loss, injury, or death resulting from seismic-related ground failure to a **less than significant** level.

Mitigation Measures

None required.

Placement of Structures on Unstable Geologic Unit or Soil – Landslides (Standard of Significance 3)

Impact 4.8.4 Structures constructed as part of the project may be subject to landslides. This impact is considered to be **less than significant**.

Landslides are defined as the movement of soil or rock down a slope due to the influence of gravity. Although landslides occur throughout Shasta County, they have not been considered a major problem. Landslides are more prevalent in the eastern and northern portions of the county

and are commonly related to the sedimentary and volcanic rocks in these vicinities. Landslides generally occur in areas of topographic relief with weak soils or bedrock underlying the slope. Many portions of the project site are relatively flat, with no significant slopes.

However, steep hilly areas exist in the southern and western portions of the property. Depending on subsurface geology, landslides could be possible in the hilly portions of the project area. Detailed topographic maps and exploration of the subsurface geology will be necessary to determine if any landslides exist. Without implementing proper engineering and mitigation techniques, the impact of landslides could be significant.

As stated in Impact 4.8.3, Chapter 15.08 of the City's Municipal Code requires that a geotechnical report be prepared for all future development under the proposed Area Plan. The report is required to include an adequate description of the geology of the site, including data regarding the nature, distribution, and strength of existing soils, a detailed subsurface investigation based on test borings, conclusions and recommendations regarding the effect of geologic conditions on the proposed development, including susceptibility and evidence of past landslides, conclusions and recommendations for grading procedures, design criteria for corrective measures when necessary, and opinions and recommendations covering adequacy of the site to be developed. The recommendations included in the report must be incorporated in the grading plans or specifications.

The requirements of Chapter 15.08 of the Municipal Code for each phase of the project would identify any landslide hazards within the project area. Therefore, the impact is considered to be **less than significant**.

Mitigation Measures

None required.

Placement of Structures on Unstable Geologic Unit or Soil – Subsidence (Standard of Significance 3)

Impact 4.8.5 The project site may contain a potential subsidence hazard. This impact is considered **less than significant**.

Subsidence is the downward movement of the land surface caused by a reduction in hydrostatic pressure in thick geologic units in response to the removal of subsurface fluids such as water or petroleum products. Because the effect of subsidence due to groundwater or petroleum product withdrawal is regional in nature, it is not expected to create a significant differential condition across the site improvements (ENGEO 2005). Therefore, the impact of a subsidence on the site is considered to be **less than significant**.

Mitigation Measures

None required.

Placement of Structures on Expansive Soils (Standard of Significance 4)

Impact 4.8.6 The project site may contain the potential for expansive soils. This impact is considered **less than significant**.

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Expansive soils swell when wet and shrink as they dry. Expansive soils generally contain mixed-layer clays, known as smectite, that expand when moisture is absorbed into the crystal structure. This results in a rise in the ground surface. Most of Shasta County is characterized by moderately expansive soils. Though expansive soils are not considered to pose a significant hazard in the City of Shasta Lake area, standard soil tests are necessary in order to determine the expansive soil potential for a particular area. The effects of expansive soils on structures can be mitigated through proper engineering design and standard corrective measures.

As stated in Impact 4.8.3, Chapter 15.08 of the City Municipal Code requires that a geotechnical report be prepared for all future development under the proposed Area Plan. The report is required to include an adequate description of the geology of the site, including data regarding the nature, distribution, and strength of existing soils, a detailed subsurface investigation based on test borings, conclusions and recommendations regarding the effect of geologic conditions on the proposed development, including evidence of expansive soils, conclusions and recommendations for grading procedures, design criteria for corrective measures when necessary, and opinions and recommendations covering adequacy of the site to be developed. The recommendations included in the report must be incorporated in the grading plans or specifications.

The requirements of Chapter 15.08 of the Municipal Code for each phase of the project would identify any expansive soils within the project area and ensure the proper design criteria for corrective measures, if necessary. Therefore, the impact is considered to be **less than significant**.

Mitigation Measures

None required.

4.8.4 CUMULATIVE SETTING, IMPACTS, AND MITIGATION MEASURES

CUMULATIVE SETTING

Geology and soil-related impacts are generally site-specific and are determined by a particular site's soil characteristics, topography, and proposed land uses. Development projects are analyzed on an individual basis and must comply with established requirements of the City of Shasta Lake and the California Building Standards Code as they pertain to protection against known geologic hazards and potential geologic and soil-related impacts.

CUMULATIVE IMPACTS AND MITIGATION MEASURES

Cumulative Geologic Impacts

Impact 4.8.7 Implementation of the proposed project in combination with reasonably foreseeable development would not contribute to cumulative geologic and soil impacts, as the impacts would be site-specific. This would be a **less than cumulatively considerable** impact under cumulative conditions.

The proposed project site could possibly be subject to erosion, slope instability, and landslide potential due to its topography and soil characteristics. On a regional basis, development in the City of Shasta Lake and adjacent areas would increase the number of people working and living in structures that could be exposed to hazards associated with seismic activity. However, geology and seismicity impacts are site-specific and are not considered to result in cumulative effects. Therefore, the project would not contribute to cumulative geological and seismicity

related impacts. Please refer to Section 4.7, Hydrology and Water Quality, for a cumulative discussion related to potential soil erosion impacts.

In general, issues associated with soil erosion can be mitigated through grading, drainage, and revegetation BMPs, as well as other local, state, and federal regulatory efforts identified throughout this DEIR. Implementation of mitigation measures **MM 4.8.1a** and **MM 4.8.1b**, as well as mitigation measures identified in Section 4.7, Hydrology and Water Quality, would ensure that the proposed project would not significantly contribute to cumulative geologic and soil impacts in the region.

Therefore, cumulative impacts associated with geology and soils are considered **less than cumulatively considerable**.

Mitigation Measures

Implementation of mitigation measures **MM 4.8.1a** and **MM 4.8.1b**, as well as mitigation measures identified in Section 4.7, Hydrology and Water Quality, would ensure that the proposed project would not significantly contribute to cumulative geologic and soil impacts in the region.

4.8 GEOLOGY AND SOILS

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4.9 CULTURAL RESOURCES

4.9 CULTURAL RESOURCES

This section evaluates the potential impacts of the project on archaeological and historical resources. California Environmental Quality Act (CEQA) Guidelines Section 15064.5(a) defines a historical resource for the purposes of environmental review. The analysis of cultural resource impacts is primarily based on archaeological investigations conducted by the Genesis Society in 2010 (**Appendix 4.9-1**).

4.9.1 EXISTING SETTING

The Area Plan project is located several miles east of the Sacramento River at the northernmost end of the Sacramento Valley. The mountains of the North Coast Range rise to the west, the Klamath Mountains are to the north, the volcanic deposits of the Cascade Range to the east, and the remainder of the Sacramento Valley to the south. Structurally, the Sacramento Valley is a large, elongate, north-south-trending asymmetric trough. Fringing this trough along its mountain borders are dissected uplands that have been structurally deformed and that are underlain primarily by unconsolidated continental deposits of Pliocene and Pleistocene age. The resultant terrain ranges from gently rolling lands to dissected hills with relief of several hundred feet or more.

Native valley oaks occur throughout the project vicinity, particularly where pockets of deep soil have accumulated. Before impacts related to mining activity and the airborne pollution from turn of the century copper processing facilities on the west side of the Sacramento River, blue oak, interior live oak, grey pine, small patches of manzanita, and various annual grasses and forbs were even more abundant than today. Major watercourses in the project site vicinity supported dense riparian associations, which were often separated from forest and chaparral associations by stands of live oak, dwarf interior live oak, manzanita, ceanothus, and redbud. These interface zones provided abundant resources and excellent habitat for numerous species of mammals and birds, many of which exploited several of these zones concurrently.

The environment of the project area has undergone some changes since the end of the Pleistocene. Paleoclimatic reconstructions by West suggest a shift from a warmer period in which plant zones were 300 meters higher in elevation and temperatures were 1.3 to 2.1 degrees Celsius warmer than at present, to the relatively cooler and more moist conditions prevalent today in which plant zones have shifted downward and southward. This shift is believed to have occurred around 2,500 to 2,800 years ago.

While the effects of long-term climatic change on environment and habitats are not fully assessed, there is no question that major environmental changes have occurred during very recent times. Biologically extractive practices during the past century and a half have reduced soil nutrients in some areas, timber harvesting and livestock grazing have reduced the available biomass, and the elimination of the Indians' practice of annual burning has undoubtedly affected many of the primary ecological relationships that once existed within the Redding area. Combined with past mining, water diversion projects, recent urban expansion to the south, access road grading, and vegetation clearing to improve pasture, the environmental structure of this portion of Shasta County has been significantly altered over the years.

ETHNOGRAPHY/PREHISTORY

At the time of Euroamerican contact, most of the western side of the Sacramento Valley north of about Suisun Bay was inhabited by Wintun-speaking people. This large group of Penutian stock was divided into a southern Patwin group, a central Wintun or Nomlaki group, and a

4.9 CULTURAL RESOURCES

northern Wintu stock. The northernmost group was further divided into nine subareas, with the project area being located within the Redding (Keswick) subgroup's territory.

Wintu subsistence was based on three main staples: deer, acorns, and salmon. All three were abundant in the Redding area, although the latter two were available only seasonally. So crucial was salmon as a food resource to the Wintu and other groups of Northern California that the availability of this food source has been used as an important variable in assessing prehistoric population levels and is considered a major determinant of site distribution among various other California Indian groups. Deer also constituted a major dietary staple, a food source which was both abundant and available essentially year-round. Lastly, acorns constituted the third primary staple of the Wintu, as a food resource seasonally abundant and storable.

The available ethnographic information documents a pattern of land use, settlement, and subsistence that was quite complex. The salmon runs, the locations of seasonally available big game (especially deer), and the distribution of acorn-yielding oak trees, which together supplied the primary staples, required major forays from the home base since all three staples were concentrated in different areas. This form of resource exploitation required not only that permanent villages be established, particularly along the Sacramento River and other major drainages, but that seasonal use be made of a wide variety of other habitat zones, where less permanent villages/camps were established and special-purpose activities undertaken. In consideration of this fact, and supported by the results of previous survey work within the project area and on nearby lands, prehistoric site types for this area included the following:

- Surface scatters of lithic artifacts and debitage associated with dark brown to black midden deposits resulting from fairly substantial encampments. Within the project area and elsewhere around Redding, such sites are frequently located adjacent or close to perennial water sources, as along the project area's Rancheria and Moody creeks.
- Surface scatters of lithic artifacts and debitage without associated middens, resulting from short-term occupation and/or specialized economic activities.
- Bedrock milling stations, including both mortar holes and metate slicks, located in areas where bedrock is exposed, particularly along stream channels.
- Petroglyphs, especially bedrock outcrops whose surfaces contain numerous cupules.
- Isolated finds of aboriginal artifacts and flakes. Large, fine-grained basalt cobbles are frequently encountered along stream channels in the Redding area and were often "assayed" in place, resulting in isolated large cores and tabular flakes.

Based on extensive archaeological excavations in the Redding area, a fairly long prehistoric sequence has emerged. This long sequence was apparently punctuated, and has in fact been largely defined, by several cultural introductions that may have coincided with population movements into the region. Specifically, the earliest occupants of this portion of Northern California are believed to have been Hokan-speakers whose material culture closely resembled the Borax Lake and Mendocino complex assemblages dating to a similar time period. While population density was probably quite low during this period (c. 4,500 BC to AD 200), these people were widely distributed throughout the region and presumably were making use of at least portions of the Sacramento Valley floor and probably utilizing acorns. Large, wide-stemmed projectile points and manos and metates are frequently encountered artifact types.

Sometime between about AD 200 and AD 500, Penutian-speaking immigrants are believed, on the basis of linguistic and other evidence, to have entered the region and initially disrupted but eventually to have displaced Hokan occupants in many areas. It has been hypothesized that the Penutian subsistence pattern and related technology were more suited to the exploitation of a riverine environment and to more intensive and extensive use of bulbs and other plants. This was coupled with animal and fishing products more intensively processed with mortars and pestles, corner-notched and small-stemmed projectile points more suited for use with bows and arrows, and a variety of other more specialized technological devices. The abundance of fish, clams, bulbs, tules, acorns, and other resources, coupled with the Penutian penchant for more intensive and extensive exploitation of these items, is believed to have resulted in a rapid population increase that eventually resulted in the Penutians displacing the Hokan occupants from the Sacramento Valley floor and portions of the adjacent foothills and mountain ranges on both sides of the Sacramento valley. This process was still under way at the time of Euroamerican contact in the mid-nineteenth century.

HISTORIC

Evidence exists to document that some of the Spanish and Mexican expeditions may have come through and made brief stays in Northern California. John Work's fur trapping expedition through central California in 1832–33, the best documented of the initial forays into the Redding area, introduced several communicable diseases to the Native inhabitants, which turned out to be devastating to Wintu culture and society.

The next major incursion by white men occurred during the Gold Rush period, which in this area began with Reading's 1848 discovery of gold south of Redding along Clear Creek. Mineral deposits along many of the streams in north Redding and streams located both to the east and west of the Sacramento River were intensively mined on a fairly small scale through the end of the nineteenth century. Just at the turn of the century, however, Shasta County began to experience accelerated population and economic growth as the mineral resource began increasingly to be mined with mechanized equipment. Hundreds of "wildcat" operations emerged to exploit the recently discovered but low-grade copper, gold, and silver deposits.

Mining stimulated the growth of other industries as well, and soon led to a burgeoning county population. Subsequently, during the 1930s, a number of dragline and bucket-line dredges were active in the Redding District, particularly along Clear Creek and Olney Creek south of Redding and the present project area. Extensive drift mining was undertaken at various locales in the vicinity of Boulder and Sulphur creeks, however, and within exposed areas above and on the east side of the Sacramento River in the general vicinity of the project area.

The early mining activity, subsequent copper mining in the Iron Mountain area west of the Sacramento River, water diversion and water storage projects along the Sacramento River, and contemporary urbanization north of Redding generally have all impacted prehistoric and early historic sites in the region. The present land area has actually fared much better than other areas of the county, however, being located within a region that remained ranchland until relatively recently. While construction of Interstate 5 along the east side of the project area affected some lands in the Area Plan study area, most of the area has remained largely unaffected by historic through contemporary ranching and residential use.

4.9 CULTURAL RESOURCES

4.9.2 REGULATORY FRAMEWORK

FEDERAL

National Historic Preservation Act

Section 106 of the National Historic Preservation Act (NHPA) 1966, as amended, presents federal regulations for the identification and protection of cultural resources. Section 106 requires federal agencies to take into account the effects of their undertakings on historic properties and afford the State Historic Preservation Officer, and, if appropriate, the Advisory Council on Historic Preservation, a reasonable opportunity to comment on such undertakings. The council's implementing regulations, "Protection of Historic Properties," can be found in 36 Code of Federal Regulations (CFR) Part 800. The goal of the Section 106 review process is to offer a measure of protection to cultural resources (e.g., prehistoric and historic sites) that are determined eligible for listing on the National Register of Historic Places. The criteria for determining National Register eligibility are found in 36 CFR Part 60. Recent amendments to the NHPA and 36 CFR Part 800 have strengthened the provisions for Native American consultation and participation in the Section 106 review process. Federal agencies must follow federal regulations, but most projects by private developers and landowners do not require this level of compliance. Compliance with federal regulations is only necessary if the project requires a federal permit, uses federal money, and/or crosses federal lands.

STATE

California Environmental Quality Act

CEQA requires that lead agencies determine whether projects may have a significant effect on archaeological and historical resources. This determination applies to those resources that meet significance criteria qualifying them as "unique," "important," listed on the California Register of Historic Resources (CRHR), or eligible for listing on the CRHR. If the agency determines that a project may have a significant effect on a significant resource, the project is determined to have a significant effect on the environment, and these effects must be addressed. If a cultural resource is found not to be significant under the qualifying criteria, it need not be considered further in the planning process.

California Register of Historic Resources

The California Register of Historic Resources (CRHR) is the state's authoritative historic listing. The list is derived from a variety of sources, including resources listed in the National Register, State Historic Landmarks, Points of Historical Interest, resources subject to local preservation ordinances, and other resources identified as significant under the criteria listed in Title 14, Section 4852 of the California Code of Regulations. The CRHR serves several purposes, one of which is to identify resources that require environmental review under CEQA.

LOCAL

City of Shasta Lake General Plan

The Open Space Element of the City's General Plan sets forth future plans for cultural resources in the city. While this Draft EIR analyzes the project's consistency with the General Plan pursuant to

4.9 CULTURAL RESOURCES

CEQA Section 15125(d), it is the City of Shasta Lake Planning Commission and/or City Council that will make the determination of the project's consistency with the identified General Plan policies.

**TABLE 4.9-1
PROJECT CONSISTENCY WITH CITY OF SHASTA LAKE
GENERAL PLAN: CULTURAL RESOURCES**

General Plan Objectives & Policies	Consistent with General Plan?	Analysis
HER-1 Conserve and manage significant prehistoric and historic cultural resources.	Yes, with mitigation	The cultural resources analysis identifies a number of sites within the proposed project boundaries. The design of the site has been modified to leave sensitive areas undisturbed. Site, CA-SHA-1823, will be impacted by the project. Mitigation of this sites is included as mitigation measures MM 4.9.2a and 4.9.2b, with the impact reduced to a less than significant level. Sites CA-SHA-1085 and -1822 will also be impacted by the project however impacts are reduced to less than significant by compliance with MM 4.9.4.
HER-a Development projects in areas containing known significant cultural resources shall be designed to minimize degradation of these resources. Where conflicts are unavoidable, mitigation measures, which reduce such impacts, shall be implemented. Possible mitigation measures may include clustering, buffer zones, and building site requirements.	Yes	See above. The proposed project both avoids the known sensitive areas and includes mitigation measures to address potentially unknown resources that could be discovered during excavation or grading activities.
HER-(a) Require a records search for any development project proposed in areas of high archaeology sensitivity to determine whether the site contains known prehistoric or historic cultural resources and/or to determine the potential for discovery of additional cultural resources.	Yes	A search was completed and is discussed in the Genesis Society's report (Appendix 4.9-1).
HER-(b) Require that sponsors of projects on sites where probable cause for discovery of archaeological resources as indicated by records search and where resources have been discovered in the vicinity of the project retain a consulting archaeologist to survey the project site. If unique resources, as defined by state law, are found, require preparation of an archaeological resource mitigation plan; monitor the project to ensure that mitigation measures are implemented.	Yes	A survey was conducted by the Genesis Society (Appendix 4.9-1).

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4.9.3 IMPACTS AND MITIGATION MEASURES

STANDARDS OF SIGNIFICANCE

Based on Appendix G of the CEQA Guidelines and Public Resources Codes (PRC) Sections 21083.2 and 21084.1, the City concludes that a project may have significant impacts on historical resources if it does any of the following:

- 1) Causes a substantial adverse change in the significance of a historical resource as defined in CEQA Guidelines Section 15064.5.
- 2) Causes a substantial adverse change in the significance of a unique archaeological resource pursuant to CEQA Guidelines Section 15064.5.
- 3) Directly or indirectly destroys a unique paleontological resource or site or unique geologic feature.
- 4) Disturbs any human remains, including those interred outside of formal cemeteries.

Under PRC Section 21083.2, a lead agency may require reasonable efforts be made to permit any or all of a unique archaeological resource to be preserved in place or left in an undisturbed state. To the extent that such a resource is not preserved in place or not left in an undisturbed state, mitigation measures shall be required as provided in Section 21083.2.

CEQA Guidelines Section 15064.5 provides guidance in determining the significance of impacts on historical and unique archaeological resources. A lead agency is required to identify potentially feasible measures to mitigate significant adverse changes in the significance of a historical resource. A “substantial adverse change” means demolition, destruction, relocation, or alteration of an historical resource or its immediate surroundings such that the significance of the resource would be materially impaired. A historical resource is considered significant if it meets one of the following criteria:

- A resource is listed in, or determined to be eligible by the California Historical Resources Commission for listing in, the California Register of Historical Resources.
- A resource is included in a local register of historical resources or identified as significant in an historical resource survey.
- The resource is determined by the lead agency to be historically significant, provided the determination is supported by substantial evidence. Generally, a resource shall be considered by the lead agency to be historically significant if it meets the criteria for listing on the California Register of Historic Resources.

As determined in the Initial Study prepared for the proposed project, implementation of the proposed project would not result in impacts associated with a paleontological resource or site or a unique geologic feature. The Initial Study also determined that the proposed project would be required to apply the provisions of California Health and Safety Code Section 7050.5 in the case that human remains are unearthed during future development of the site. Under this Health and Safety Code section, if human remains are unearthed during construction, no further disturbance shall occur until the county coroner has made the necessary findings as to origin

and disposition, pursuant to California Public Resources Code Section 5097.98. Therefore, these impacts (Standards of Significance 3 and 4) will not be addressed further in this Draft EIR.

METHODOLOGY

PMC reviewed the archaeological and historical investigations for the Mountain Gate at Shasta Area Plan located in the City of Shasta Lake. The Archeological Inventory Survey Report dated November 2010 was completed by Sean Jensen of the Genesis Society. The archeological investigations conducted by Jensen included a records search at the Northeast Information Center at California State University, Chico; a sacred lands search conducted by the Native American Heritage Commission (NAHC); consultation with Redding Wintu Tribe members; consultation with the Turtle Bay/Redding Museum; and a pedestrian field survey of the proposed project area with a completed Archeological Inventory Survey documenting the results of those investigations. PMC and the City of Shasta Lake consulted with all groups and individuals identified by the NAHC regarding the project.

The sacred lands search did not identify any sensitive Native American cultural resources in the project area. Further consultation with Wintu Tribe representatives led to a field inspection conducted on March 8, 2005, followed with an agreement to accept recommendations contained in the Treatment Plan of the Archeological Inventory Survey Report. In summary, a reasonable effort has been made to identify cultural resources within the proposed project area for the Mountain Gate at Shasta Area Plan.

The records search for the project indicated extensive prior archaeological survey, site recordation, and excavation of selective sites within the project area. An initial survey was completed by James Dotta in 1981, followed by re-survey and site evaluation work by Jensen between 1990 and 1994. A total of seven state number sites have been identified on the project site (five prehistoric and two historic).

The proposed Area Plan would include the need for off-site improvements. A roadway connection will be required to connect Shasta Dam Boulevard with the proposed project. The roadway would extend around a redevelopment site owned by the City of Shasta Lake. Access to the south end of the project site is proposed via an intersection of the main project road with Cascade Boulevard. The project may include an alternate access route via the northeasterly extension of Black Canyon Road, which would connect to the internal project roadway. Extension of water and wastewater collection systems to the site would be required and would involve off-site work in Shasta Dam Boulevard and the new roadway extending from the boulevard onto the project site. The proposed project would also require the construction of a 1.0 million gallon (mg) water storage tank, located to the northwest of the Area Plan. According to information provided by the City of Shasta Lake, the project will require a new substation converting 115 kilovolts (kV) to 12 kV to properly service the development, and this station would require the dedication of 2 acres on the west side of the development. The Archeological Inventory Survey (2010) document analyzes these off-site areas.

ANALYSIS OF IDENTIFIED RESOURCES

Site CA-SHA-1082

This site was initially encountered by Dotta and Brott in 1981 in conjunction with initial surveys for proposed long-term residential development for the proposed Area Plan. The site was described

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a “lithic scatter” extending approximately 40 by 55 meters flanked by creeks on both sides, containing no formed artifacts and no evidence of subsurface accumulation but consisting solely of “crude waste flakes and cores”. Renewed interest in proposed residential development resulted in Jensen conducting additional survey in the area of the site and re-recording this site in 1989. Between 1981 and 1989, substantial ground-disturbing impacts occurred to this site and environs in conjunction with road grading, brush clearing, and tree removal during preliminary planning and mapping for the proposed project site under new (1989) ownership. As a consequence, much more of the ground surface was exposed by 1989, and the Jensen re-survey and re-recording of this site expanded the site boundary to approximately 300 meters in length (north–south) by approximately 65 meters in width, covering an overall surface area of approximately 15,000 square meters.

While the 1989 field survey extended the site boundary, observed cultural materials and densities were roughly the same as those made by Dotta and Brott in 1981; evidence of prehistoric activities at this location consisted solely of a very light density surface scattering of basalt, chert, and obsidian flakes and occasional cores, with surface density varying from 1 to 3 items per 100 square meters to 1 item per 200 square meters. As in 1989, no features were observed; e.g., no house pit depressions, petroglyphs, rock alignments, or bedrock milling stations. No evidence of a subsurface component was observed nor indications that a charcoal-stained or otherwise “dark” midden had accumulated within the site boundary.

With the objective of further evaluating the previous researchers’ observations concerning the lack of midden or other subsurface accumulation at this site, a program of shovel test pit (STP) excavation was undertaken in 2008.

A total of 30 shovel test pits were excavated throughout the entire site area. Each 50-centimeter-square STP was excavated in arbitrary 10-centimeter increments, with excavated depths ranging from 30 to 50 centimeters. All excavated soil was passed through ¼-inch mesh screen in order to determine the presence/absence and depth of any subsurface-occurring cultural material encountered, with the additional objective of characterizing the general age of any deposit assuming that diagnostic implement types might be encountered.

Fifty-eight (58) prehistoric artifacts were identified within the 30 STPs excavated. Materials recovered from the STPs consisted primarily of basalt (31), obsidian (21), and chert (6) waste flakes and cores between the surface and 10-centimeter depth (38 of the 58 items) and from 10 through 50 cm depth (20 of the 58 items).

The data from excavation may be further summarized as follows:

- Volume of soil excavated: approximately 2.575 cubic meters
- Recovery rate for prehistoric items: approximately 23 items per cubic meter based on the total recovery of 58 items
- Number of formed prehistoric artifacts per cubic meter: zero
- Number of formed prehistoric artifacts from the surface: zero

Based on both surface observations and STP results, this site does not contain a subsurface cultural component.

Site CA-SHA-1085

Originally recorded by Dotta in 1981 and subsequently re-recorded by Shapiro and Jensen in 1989, this site consists of a prehistoric occupation locale approximately 60 meters north of the confluence of Moody Creek with an unnamed ephemeral stream course, immediately south of a large knoll or hill. The site extends approximately 135 meters in length by 90 meters in width and consists of basalt, chert, and obsidian surface-occurring lithics, a midden deposit identifiable as a well-defined dark, “greasy-textured” soil, and one possible house pit depression. Disturbance to the surface and subsurface components of the site have accompanied cattle grazing and ranch road grading.

In order to more accurately establish the extent of the midden, Jensen implemented a program of surface artifact evaluation and subsurface excavation units. Five 1-meter-square units were placed within the midden, and one unit was excavated within the pit feature in the southern portion of the site. Midden depth averaged less than 40 centimeters of primary deposit, with deeper pockets at rodent holes and following oak tree roots. Excavation yielded a total of 673 items from the six units excavated, a very low recovery rate (low artifact density) when compared with other Late Period habitation locales in this part of Shasta County. Chipped stone tools were represented by 43 of the 673 recovered items, again a fairly low density of formed tool types, although 12 of these 43 items were projectile points, with all of the classifiable specimens being Gunther Series forms (Late Period/Redding Aspect). The single excavation unit placed within the pit feature at the site (Unit #5E) suggested that this feature is recent and contemporary, and does not represent the remains of a semi-subterranean dwelling feature.

Similar results were obtained during excavation at nearby CA-SHA-1822. Both of these sites appear to represent single-component, Late Period special use areas with a restricted range of utilitarian tool types, including both chipped and ground stone implements. Neither site yielded significant faunal bone or other dietary remains, a finding that contrasts sharply with results obtained from numerous other Redding area sites that are believed to represent primary habitation locales. Debitage is dominated by interior flakes of obsidian, another indicator of Late Period occupation. Finally, the absence of significant quantities of fire-cracked rock (and mortar holes) suggests that intensive additional food processing and/or basket cooking may not have occurred, another finding consistent with the conclusion that sites CA-SHA-1085 and -1822 both represent special-use areas likely linked with primary habitation elsewhere, perhaps at another nearby site (CA-SHA-1823).

Site CA-SHA-1086

This site was initially encountered by Dotta and Brott in 1981 in conjunction with initial surveys for proposed long-term residential development for the proposed Area Plan. The site was described as “thinly distributed lithic scatter extending approximately 30 by 80 meters, containing no formed artifacts and no evidence of subsurface accumulation”. Renewed interest in proposed residential development resulted in Jensen conducting additional survey in the area of the site and re-recording this site in 1989. Between 1981 and 1989, substantial ground-disturbing impacts occurred to this site in conjunction with extensive road grading, brush clearing, and tree removal during preliminary planning and mapping for the proposed Area Plan under new ownership. As a consequence, much more of the ground surface had been exposed by 1989 and/or cultural materials had been mechanically distributed over a wider area, and as a consequence the Jensen re-survey and re-recording of this site expanded the site boundary to approximately 425

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meters in length (northwest–southeast) by approximately 45 meters in width, covering an overall surface area of approximately 17,000 square meters.

While the 1989 field survey extended the site boundary, observed cultural materials and densities were roughly the same as observations made by Dotta and Brott in 1981; evidence of prehistoric activities at this location consisted solely of a very light density surface scattering of basalt, chert, and obsidian flakes and occasional cores, with surface density varying from 1 to 3 items per 100 square meters to 1 item per 200 square meters. In addition to the flakes and occasional basalt cores, the 1989 survey identified a single obsidian Gunther Series projectile point fragment and a large chert point tip fragment. As in 1989, no features were observed; e.g., no house pit depressions, petroglyphs, rock alignments, or bedrock milling stations. No evidence of a subsurface component was observed nor indications that a charcoal-stained or otherwise dark midden had accumulated within the site boundary.

With the objective of further evaluating the previous researchers' observations concerning the lack of midden or other subsurface accumulation at this site, a program of shovel test pit excavation was undertaken in 2008.

A total of 30 shovel test pits were excavated throughout the entire site area. Each 50-centimeter-square STP was excavated in arbitrary 10-centimeter increments, with excavated depths ranging from 30 to 50 centimeters. All excavated soil was passed through ¼-inch mesh screen in order to determine the presence/absence and depth of any subsurface-occurring cultural material encountered, with the additional objective of characterizing the general age of any deposit assuming that diagnostic implement types might be encountered.

Forty-five (45) prehistoric artifacts were identified within the 30 STPs excavated. Materials recovered from the STPs consisted primarily of basalt (27), obsidian (9), and chert (9) waste flakes and cores between the surface and 10 centimeter depth (26 of the 45 items) and from 10 through 40 centimeter depth (19 of the 45 items).

The data from excavation may be further summarized as follows:

- Volume of soil excavated: approximately 2.625 cubic meters.
- Recovery rate for prehistoric items: approximately 17 items per cubic meter based on the total recovery of 45 items
- Number of formed prehistoric artifacts per cubic meter: zero
- Number of formed prehistoric artifacts from the surface: two projectile point fragments

Based on both surface observations and STP results, this site does not contain a subsurface cultural component.

Site CA-SHA-1822

Originally recorded by Dotta in 1981 as site CA-SHA-1084 and -1822, and subsequently re-recorded by Shapiro and Jensen in 1989 as CA-SHA-1822, this site consists of a prehistoric occupation locale adjacent to the west bank of Moody Creek. The site extends approximately 130 meters in length by 45 meters in width, and consists of basalt and obsidian lithics, a midden deposit, and a possible house pit depression. In late 1989, the property owner conducted limited

tree and brush removal throughout the subject property, resulting in extensive damage to site CA-SHA-1822. Bulldozer scars and other ground-disturbing activities within the site boundary were noted by Jensen in 1990.

In order to more accurately establish the extent of the midden deposit and the potential significance of the site per CEQA, Jensen implemented a program of surface artifact evaluation and subsurface excavation units. Five 1-meter-square units were placed within the midden area, with excavation indicating an average depth of approximately 40 centimeters of primary deposit, with deeper pockets at rodent holes and following oak tree roots. Approximately one-half (west half) of the entire midden deposit had been substantially bulldozed and removed from this site, a fact confirmed by the results obtained within two of the five units excavated.

Excavation yielded a total of 382 items from the five units excavated, a very low recovery rate (low artifact density) when compared with other Late Period habitation locales in this part of Shasta County. Chipped stone tools were represented by 11 of the 382 recovered items, again a very low density of formed tool types, with 4 of these 11 items being projectile points. Three of the classifiable specimens are Gunther Series forms (Late Period/Redding Aspect), with the fourth example representing a small stemmed artifact. All were produced from obsidian. No ground stone food-processing implements are represented.

As noted above in the discussion under CA-SHA-1085, both CA-SHA-1085 and -1822 produced similar results: both sites represent single-component, Late Period special use areas with a restricted range of utilitarian tool types, including both chipped and ground stone implements at CA-SHA-1085 only, with no ground stone implements recovered from CA-SHA-1822. Neither site yielded significant faunal bone or other dietary remains, while debitage at both sites is dominated by interior flakes of obsidian, another indicator of Late Period occupation. Finally, the absence of significant quantities of fire-cracked rock at both sites suggests that intensive additional food processing and/or basket cooking may not have occurred, a finding consistent with the conclusion that sites CA-SHA-1085 and 1822 represent special-use areas likely linked with primary habitation elsewhere, perhaps at nearby site CA-SHA-1823.

Site CA-SHA-1823

Originally observed but not formally recorded by Dotta in 1981, subsequently formally recorded by Jensen in 1989, this site consists of a prehistoric occupation locale located adjacent to the west bank of an unnamed perennial stream course that is tributary to Rancheria Creek. The site extends approximately 130 meters in length, averages about 30 meters in width, and is recognizable on the basis of basalt and obsidian surface-occurring lithics, a midden deposit, a bedrock mortar (hopper), and approximately 200 petroglyph cupules. Based on information reviewed at the Redding Museum in 1989, this site may represent the ethnographic village of Simisbaki, an unrecorded locale assigned #55 in Guilford-Kardell and Dotta.

As part of the site recordation process in 1989, Jensen also implemented limited shovel test pit excavation in order to more accurately define the sub-surface limits of the cultural deposit. Visitation to the site by Wintu representatives in 1989–1990 in conjunction with testing at sites CA-SHA-1085 and -1822 resulted in a recommendation that this site, possibly visited and documented ethnographically and containing a petroglyph, represented a resource of traditional cultural value. The site was revisited with Kelly Hayward of the Toyon-Wintu Tribe on March 8, 2005, in conjunction with proposed development activities at that time.

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Site CA-SHA-1447-H

This site represents the general route of the wagon (toll) road (Sacramento River Road) between Old Shasta and Oregon. The road was originally constructed in 1853 and utilized as a toll road, and first historically recorded by Magee in his 1862 Official Map of Shasta County, wherein Magee stated, “After the Sacramento River Trail [CA-SHA-1447-H] was opened in the late 1850s, the main road from Shasta north to Oregon passed through Buckeye.” The road through Buckeye (the present historic site) continued to be “the main Pacific Highway north for many years” after the county seat was moved from Shasta to Redding. The Buckeye Road, as it was also known, was used as a postal route until at least 1884 to serve post offices north of Redding, including Buckeye and Mountain Gate, with the latter located a short distance north of the present project area. In 1883, the Southern Pacific Railroad was extended north of Waugh’s Ferry, following the west side of the Sacramento River and then up the Sacramento River Canyon. With the construction of Shasta Dam in the early 1950s, the Southern Pacific Railroad was rerouted to the east, where it partially followed the old California-Oregon Trail route. These two historic roadways—the California-Oregon Trail route and the Sacramento River Trail or site CA-SHA-1447-H—originally merged with one another at Mountain Gate, which is located approximately a half mile northeast of the recorded segment of CA-SHA-1447-H within the project property.

The 2005 field inspection involved examination of that segment located within the project area. Here the roadbed averages 12 feet maximum width, with no residual historic features remaining (such as two-track ruts, historic trash scatters, etc.). In fact, all of old road segment within the present project area has been graded on multiple occasions over the past century and utilized in ranching operations. Very recent and non-ranch use of the alignment has involved off-road vehicle activity. “New” alignments parallel portions of what appears to be the original road route, where flooding has made portions of the original corridor impassable.

Site CA-SHA-1824-H

This site was recorded by Jensen and Shapiro in 1989 and evaluated by historian Joe Mazzini. The site represents a historic through contemporary residence and ranch complex, originally (or at least at the time of recordation) containing nine features, including a single-story residence and associated garages, barns, sheds, corrals, etc. Most of the features are collapsed or partially collapsed and/or burned or partially burned. Mazzini completed a thorough evaluation of the historic origins and associations of the complex, including examining records at Shasta County and interviewing four informants with first-hand knowledge of the history of construction and use of the property.

Based on Mazzini’s research, an earlier residence located approximately 100 feet from the existing complex was constructed in 1906, but during the 1940s was dismantled, with the upstairs and all porches removed and the lower section relocated, substantially remodeled, and erected at the present location of Feature A residence. The original 1906 residence was built by James J. Murphy, who acquired a portion of the present project area and moved to this location in 1906 following sale of his cattle ranch at Montgomery Creek, Shasta County. The new Murphy cattle ranch operation was established within the present project area lands, but lasted only through 1921, at which time Murphy sold out to Rodriguez, who lost the property to Barner in a default proceeding filed with the Shasta County Court.

The entire history of occupancy and ownership at this location is documented in Mazzini’s report. None of the occupants, beginning with J. S. P. Bass in 1872, who brought the actual land title up

to date in his name (script patent), through Fred Peri (who acquired the property in 1976), whose estate retained an interest in the property, are known to have been especially important in local or regional history. Perhaps the most “prominent” of the property’s owners was its first owner, J. S. P. Bass, who settled in Shasta County in 1849 and operated a freight pack train between Shasta (historic Old Shasta) and Scott Valley in Siskiyou County. However, elements of the built environment associated with Bass’s operation were located at Mountain Gate, located approximately 1 mile north-northeast of site CA-SHA-1824-H and known as Bass Station. This location, well outside the boundaries of site CA-SHA-1824-H, was along the historic California-Oregon Trail, subsequently partially built over by the Southern Pacific when the railroad was rerouted around Shasta Dam and Shasta Lake.

IMPACTS AND MITIGATION MEASURES

Archaeological investigations (i.e., record search and pedestrian surface survey) conducted by the Genesis Society (2010) identified typical prehistoric and historic resources that would likely be present in the project area. These archaeological investigations identified seven sites, five prehistoric isolates (e.g., isolated artifacts such as projectile points), and two isolated historic resources (e.g., isolated artifacts and features such as wagon trails).

Cause a Substantial Adverse Change in the Significance of Cultural Resources (Standards of Significance 1 and 2)

Impact 4.9.1 The proposed project at buildout could result in the potential disturbance of previously undiscovered cultural resources (e.g., prehistoric sites, historical sites, and isolated prehistoric and/or historic features or artifacts) and human remains. This impact is considered **potentially significant**.

Archaeological and historical investigations for the proposed project are adequate to identify typical prehistoric and historic resources on the project site. However, there is a possibility of unanticipated and accidental archaeological discoveries during ground-disturbing project-related activities. Unanticipated and accidental archaeological discoveries during project implementation may have the potential to affect significant archaeological resources and human remains. Therefore, this impact is considered **potentially significant**.

Mitigation Measures

MM 4.9.1 Should any cultural resources, such as structural features, unusual amounts of bone or shell, artifacts, or architectural remains, be encountered during development activities, work shall be suspended and the City of Shasta Lake Development Services Department shall be immediately notified. At that time, the City will coordinate any necessary investigation of the discovery with an appropriate specialist (e.g., archaeologist, architectural historian, Native American tribe). The project applicant shall be required to implement any mitigation necessary for the protection of cultural resources.

The City of Shasta Lake and the project applicant shall consider mitigation recommendations presented by a qualified archeologist for any unanticipated discoveries. The City and the project applicant shall consult and agree on implementation of a measure or measures that the City and the project applicant deem feasible and appropriate. Such measures may

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include avoidance, preservation in place, excavation, documentation, curation, data recovery, or other appropriate measures.

Timing/Implementation: As a condition of project approval and implemented during construction activities

Enforcement/Monitoring: City of Shasta Lake Development Services Department

Implementation of mitigation measure **MM 4.9.1** would reduce potential impacts to any cultural resources uncovered during project activity to **less than significant**. This mitigation measure would avoid any significant damage to any undiscovered prehistoric and/or historic resources until a professional archaeologist, historian or Native American tribe could assess their significance and determine if mitigation is necessary. As previously stated, the proposed project would be required to apply the provisions of California Health and Safety Code Section 7050.5 in the case that human remains are unearthed during future development of the site. Under this Health and Safety Code section, if human remains are unearthed during construction, all work must stop in the immediate vicinity of the find, and the county coroner must be notified, according to Section 7050.5 of the California Health and Safety Code. If the remains are determined to be Native American, the coroner will notify the Native American Heritage Commission, and the procedures outlined in CEQA Section 15064.5(d) and (e) shall be followed.

Cause a Substantial Adverse Change in the Significance of Cultural Sites CA-SHA-1082 and CA-SHA-1086 (Standard of Significance 1)

Impact 4.9.2 Implementation of the proposed project could result in the potential disturbance or destruction of sites CA-SHA-1082 and CA-SHA-1086. This impact is considered **less than significant**.

Neither of these prehistoric sites contains buried deposits and neither possesses surface features such as mortars, house pit depressions, petroglyphs, etc. Sites CA-SHA-1082 and -1086 are both extensive surface scatters of basalt flakes and occasional cores associated with narrow but well-defined ridges flanking stream margins. Moreover, flake/core density is very low in portions of both sites, being no more than about 1 or 2 flakes per 100 square meters of surface area. Shovel and trowel probes were placed throughout the site boundaries, initially at the time of recording in 1989–1990 and again in 2005 and 2008. The 2008 shovel test pit program resulted in the recovery of 58 and 45 items, respectively. Considering the volume of material excavated, the sites produced 23 and 17 items per cubic meter, respectively. The majority of these artifacts were recovered from the surface and upper layers excavated, with the conclusion that neither of these sites contains a subsurface cultural component. Based on these findings, neither of these sites is recommended as eligible for any National Register of Historic Places (NRHP) criteria, inclusion on the NRHP, or inclusion on the California Register of Historical Resources (CRHR). This impact is **less than significant**.

Mitigation Measures

None required.

Cause a Substantial Adverse Change in the Significance of Cultural Site CA-SHA-1823 (Standard of Significance 1)

Impact 4.9.3 Implementation of the proposed project could result in the potential disturbance or destruction of site CA-SHA-1823. This impact is considered **potentially significant**.

Site CA-SHA-1823 contains buried deposits in the form of a midden associated with mortar holes and a petroglyph-bearing boulder. Site CA-SHA-1823 has not been formally tested, but the color and texture of the midden, coupled with the presence of mortars and a boulder outcrop containing a large number of cupules ("rain rock" petroglyphs), appear clearly to represent Late Period occupation. While testing has not been undertaken, dating of the deposit, as indicated above, seems reasonably estimated and the midden has been well defined on the basis of a 1994 program of shovel test pit excavation and other evaluative work. The site appears intact and not recently disturbed, and is recommended eligible under NRHP criterion d for research and information values, particularly since the midden is accompanied by features, including especially the petroglyph. Moreover, the Wintu representative has commented that intact sites containing petroglyphs are becoming increasingly rare in the Redding area, with the petroglyph representing a feature of religious significance and signaling the possible presence of portable artifacts in the midden representing ceremonial activity and/or possible burials. Therefore, any project-related activity/disturbance that may have an adverse impact to the site is considered **potentially significant**.

Mitigation Measures

MM 4.9.3a Preservation of site CA-SHA-1823 is required through avoidance measures, including a 50-foot buffer distance around the site, from lands that will be directly impacted by buildout of the proposed project.

Timing/Implementation: Prior to and during grading and construction activities

Monitoring/Enforcement: City of Shasta Lake Development Services Department

MM 4.9.3b Implementation of a long-term monitoring plan is required to ensure that impacts to the site will not accompany proposed buildout of and subsequent activities within the project area. The monitoring plan shall include the following information:

1. Baseline Data: Take photographs of the site prior to any construction activity (road and commercial construction activities). These photographs will provide the baseline data for subsequent site inspections and monitoring of site conditions. A copy of the photographs shall be delivered to the landowner for permanent curation.
2. Field Inspections and Reports: A professional archaeologist shall conduct field inspections at the site/preservation area, using the photographs taken in the baseline year as representing the "pristine" condition of the site, as follows:

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- The initial inspection shall be undertaken at the beginning of construction work, including road grading and land re-contour, and will continue for five years. The selected archaeologist shall prepare a summary report following each annual field inspection, in which the condition of the site and any observed impacts to it shall be summarized. If impacts to the site have occurred, the report shall detail appropriate treatment changes, based on specific findings and field observations. "Treatment changes" could include, but are not necessarily limited to, such actions as depositing boulders or other cover over or around the site deposit.
 - On the fifth annual inspection, the archaeologist shall render a conclusion as to whether additional annual inspections are necessary, or alternatively whether or not the program of annual inspections shall be terminated. In reaching a conclusion, the archaeologist shall consider several factors, including (1) the extent of any impacts to the site that have accompanied buildout and use of nearby lands, and (2) whether or not indigenous or other (exotic) vegetation might be adversely affecting the preservation area for which some specialized treatment might be recommended.
3. Native American Consultation: Prior to commencement of the initial field inspection and each annual inspection identified under MM 4.9.3b(2) above, affected/interested local tribal governments shall be notified to allow the tribes to provide their own on-site cultural resource monitor(s) during grading and activities.
 4. Responsibility for implementing the long-term monitoring plan shall reside with the developer at the time of initial construction activity, transferring thereafter to the final property owner(s).

Timing/Implementation: *Prior to and during grading and construction activities*

Monitoring/Enforcement: *City of Shasta Lake Development Services Department*

Implementation of mitigation measures **MM 4.9.3a** and **MM 4.9.3b** would reduce impacts to **less than significant**.

Cause a Substantial Adverse Change in the Significance of Cultural Sites CA-SHA-1085 and CA-SHA-1822 (Standard of Significance 1)

Impact 4.9.4 Implementation of the proposed project could result in the potential disturbance or destruction of sites CA-SHA-1085 and CA-SHA-1822. This impact is considered **potentially significant**.

Sites CA-SHA-1085 and CA-SHA-1822 contain buried deposits in the form of a midden and limited non-artifactual midden constituents (poorly preserved animal bone). Sites CA-SHA-1085 and -1822 were subjected to test unit excavation in 1989–1990, and based on results of that evaluation, both were recommended as not significant per CEQA on the grounds that both had suffered substantial disturbance to surface and subsurface components, no features were

present, artifact types encountered were narrow in range and very low in density, and both appeared essentially duplicative of existing information taken from much better preserved sites relevant to the Late Period in the Redding area. However, this earlier recommendation is here revised, in part on the basis of prehistoric site losses in the region during the past two decades and in part on the basis of consultation with Toyon-Wintu representative Kelly Hayward.

Based on the potential for a program of focused data recovery to acquire additional site dating information important in studies of regional settlement and land use patterns, it is recommended that these two sites retain limited data classes, not previously fully exploited, that render them eligible for the National Register under criterion d. Recovery and analysis of these limited data classes as part of a program of data recovery would reduce project impacts to these sites to less than adverse levels, and therefore the following mitigation is required.

Mitigation Measures

MM 4.9.4

1. Sites CA-SHA-1085 and -1822 shall be subjected to a focused data recovery effort with the primary goal of recovering dating samples (charcoal). In the process of recovering datable charcoal, additional cultural materials recovered shall be analyzed in comparison with previously recovered cultural material from the sites. The focused data recovery program shall proceed as identified in the Archaeological Inventory Survey for "Testing and Data Recovery Approach" as follows:
 - Excavation utilizing 1-meter-square exposures and in arbitrarily defined 10-centimeter levels, with all recovered material screened through ¼-inch mesh, unless very small objects (e.g., beads) are observed, in which case screening would shift to 1/8-inch mesh.
 - Submission of charcoal samples for radiocarbon analysis if material is recovered in suitable quantities and in sufficiently undisturbed contexts to warrant evaluation.
 - Evaluation of recovered cultural material in relation to local and regional typologies for various types of formed artifacts that might be exposed.
 - Preparation of a final report, to proceed in conformity with standard professional practices, designed to detail the information and research values of recovered cultural material.
 - For all sites subjected to data recovery excavation, recovered cultural material would be accessioned and the final report would include illustration of representative examples of formed artifact types, including especially diagnostic projectile points, beads, and other artifact types.
 - All materials recovered during the project would be considered the real property of the property owner/project proponent, and would be returned to the property owner along with the final report for permanent curation.
2. Native American Consultation: Prior to commencement of the data recovery effort identified under MM 4.9.4a (1) above, affected/interested local tribal

4.9 CULTURAL RESOURCES

governments shall be notified to allow the tribes to provide their own on-site cultural resource monitor(s) during grading and activities.

3. Responsibility for implementing the long-term monitoring plan shall reside with the developer at the time of initial construction activity, transferring thereafter to the final property owner(s).

Timing/Implementation: *Prior to grading and construction activities*

Monitoring/Enforcement: *City of Shasta Lake Development Services Department*

Implementation of mitigation measure **MM 4.9.4** would reduce impacts to **less than significant**.

Cause a Substantial Adverse Change in the Significance of Cultural Site CA-SHA-1824-H (Standard of Significance 1)

Impact 4.9.5 Implementation of the proposed project could result in potential disturbance or destruction of historic site CA-SHA-1824-H. This impact is considered **less than significant**.

Based on the results of the archaeological investigations (i.e., record search and pedestrian surface survey) conducted by the Genesis Society (2010), site CA-SHA-1824-H represents a residence and ranch complex. Much of the historic qualities and site integrity has been destroyed from bulldozing and ranching activities. This site is not recommended as eligible for inclusion on the HRHP and CRHR. Investigations confirmed there is no new evidence present on the site that would differ from the record information located at the Northeast Information Center at California State University, Chico, and the historic documentation completed by Joe Mazzini. In result, the impacts to the site would be **less than significant**.

Mitigation Measures

None required.

Cause a Substantial Adverse Change in the Significance of Cultural Site CA-SHA-1447-H (Standard of Significance 1)

Impact 4.9.6 Implementation of the proposed project could result in potential disturbance or destruction of historic site CA-SHA-1447-H. This impact is considered **less than significant**.

Historic site CA-SHA-1447-H represents the general route of the wagon (toll) road between Old Shasta and Oregon. This site is recommended eligible for inclusion under National Register criteria a and b, primarily through the association with locally and regionally important historic events, activities, and persons considered important in the early history of Shasta County for the period 1853 to 1883. However, the site is considered to have lost its historic integrity from grading, bulldozing, ranching activities, and more recently recreational activities. The physical remains of the site no longer exhibit any of the qualities of preservation for exhibition purposes or future research. Records indicate the qualities of the site as represented in criteria a and b have already been fully preserved in existing records, written and oral histories, newspaper accounts, historic county maps, and US Geological Survey (USGS) maps. Based on the premise of existing

documentation and recordation, mitigated actions have already been completed, resulting in a **less than significant** impact.

Mitigation Measures

None required.

4.9.4 CUMULATIVE SETTING, IMPACTS, AND MITIGATION MEASURES

CUMULATIVE SETTING

The cumulative setting associated with the proposed project includes proposed, planned, reasonably foreseeable, and approved projects in the vicinity of the project site.

CUMULATIVE IMPACTS AND MITIGATION MEASURES

Cumulative Prehistoric and Historic Resources

Impact 4.9.7 Implementation of the proposed project, along with any foreseeable development in the project vicinity, could result in cumulative impacts to cultural resources. This is considered a **less than cumulatively considerable** impact.

Implementation of the proposed project, in combination with cumulative development in the City of Shasta Lake, would increase the potential to disturb known and undiscovered cultural resources. Implementation of mitigation measures **MM 4.9.1**, **MM 4.9.3a** and **MM 4.9.3b**, and **MM 4.9.4** would mitigate the project's contribution to the cumulative destruction of cultural resources to a **less than cumulatively considerable** level.

4.9 CULTURAL RESOURCES

REFERENCES

Genesis Society. 2010. *Archaeological Inventory Survey: Mountain Gate Meadows Development Project, 600 acres, City of Shasta Lake, Shasta.*

4.10 UTILITIES AND SERVICE SYSTEMS

This section describes the existing utility and service systems in the City of Shasta Lake and identifies the potential impacts on these systems as a result of the proposed project. The information in this section is based on a review of City documents, technical reports, and consultation with City staff and area service providers.

4.10.1.1 EXISTING SETTING FOR WATER SERVICE

The City obtains its water from the federal Central Valley Project through a contract with the U.S. Bureau of Reclamation (BOR). The initial 40-year contract between the BOR and the former Shasta Dam Area Public Utility District expired in 1988. According to the 2002 annual water allocation from the BOR, 2,750 acre-feet of water were allocated to the City of Shasta Lake. More recent contracts with the BOR have increased the annual water allocation to the City to 4,400 acre-feet. In the past, supplemental water has been purchased from the Centerville Community Services District, the McConnell Foundation under short-term contracts, and the Anderson-Cottonwood Irrigation District (ACID).

The City of Shasta Lake water treatment plant (WTP) was constructed in 1990 and is designed to meet California Department of Health Services (DHS) standards for domestic drinking water. The treatment plant is located on the east abutment of Shasta Dam. The DHS issued an Operating Permit to the City in 1996. Inspections of the treatment plant are periodically conducted to ensure the City meets all current federal and state drinking water standards.

The City's present water supply system consists of an intake piping system from inside Shasta Dam, a raw water pump station at the base of the dam, a treatment plant above Fisherman's Point, and a transmission main along Lake Boulevard. This water is pumped to the City's water treatment plant above the dam to the east and in turn, the City supplies treated water to the Shasta Dam Administrative and Construction Maintenance facilities complex as well as to residents and businesses of the city.

The City's water intake facilities utilize some of the 10-inch pipelines that are associated with the 8-foot-diameter dam spillway discharge tubes at the 950- and 750-foot elevations (four existing connections at the 950-foot level and three existing connections at the 750-foot level). In addition to the existing connections, there are eight tap locations at the 850-foot level, which could be connected to the City's raw water intake system.

The City currently delivers an average of 4.8 MGD through its distribution system at peak demand. The treatment plant is capable of treating and distributing a maximum of approximately 9.72 MGD. Manifold piping exists at the treatment plant and could accommodate a fourth filter when the treatment plant nears capacity. The City also owns suitable property to construct a new water treatment plant in the future if the present water plant reaches its full capacity.

As recommended in the Supplemental Water Supply Feasibility Study, prepared by Pace Civil, Inc. (2007) for the City of Shasta Lake, Bella Vista Water District, and Mt. Gate Community Services District, connections to one additional 10-inch pipeline at the 750-foot level and six additional 10-inch pipelines at the 850-foot level would provide sufficient flexibility and reliability to yield sufficient supplemental raw water flow needed for the City of Shasta Lake and Mt. Gate Community Services District at lake-level elevations of about 865 feet and higher. Based on preliminary discussions with the BOR at the time the report was prepared, it appears feasible to construct the needed piping improvements within the existing dam corridors, similar to the retrofit piping that was installed in 1958.

The WTP is currently covered under RWQCB Order R5-2012-0018, National Pollutant Discharge Elimination System (NPDES) CA 0004693. The Order contains Final Effluent Limitations based on

4.10 UTILITIES AND SERVICE SYSTEMS

implementation of the California Toxics Rule and Water Quality Control Plan for the Sacramento and San Joaquin River Basins for the protection of the beneficial uses for Churn Creek, which include cold freshwater habitat; warm and cold migration of aquatic organisms; and warm and cold spawning, reproduction, and/or early development.

Currently, solids that are formed during the water treatment process, along with ambient turbidity that is removed from the raw water, are trapped and removed in both the solids contact clarifiers and the filters at the WTP. Solids are then conveyed to a Solids Holding Basin located on the WTP site, where they settle and thicken. Residual solids are periodically conveyed from the Solids Holding Basin to one of two ponds located at the former site of the Summit City WTP on Red Bud Lane. At the Red Bud Lane facility, solids are again settled and thickened, and clarified water overflows the ponds and discharges to an unnamed tributary to Churn Creek. The City has an NPDES waste discharge permit (Order R5-2006-0102, NPDES CA 0004693) to discharge up to 175,000 gallons per day from the ponds.

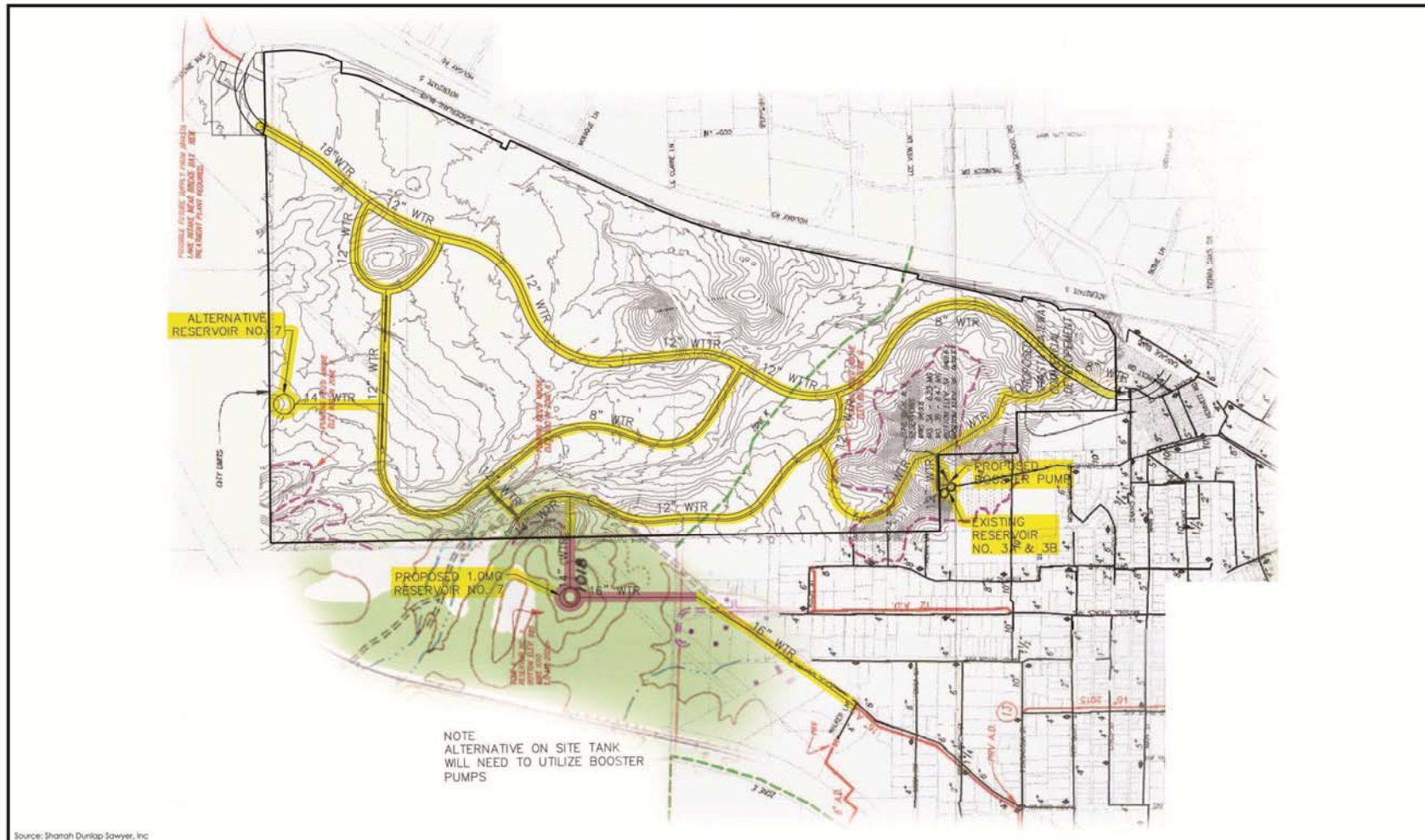
On March 30, 2012, RWQCB issued Time Schedule Order R5-2012-0019 for the WTP to address Final Effluent Limitations for dichlorobromomethane, based on implementation of the California Toxics Rule. In order to comply with these new state requirements, the City evaluated alternatives for a permanent solids dewatering facility that would eliminate the discharge from the Red Bud Lane ponds. The City is required to come into compliance with the TSO no later than March 30, 2017. The City has decided to construct a mechanical dewatering facility at the WTP that would dewater the residuals that are currently settled at the Red Bud Lane holding basins, eliminating the need for the Red Bud Lane facility, and eliminating the discharge to the tributary of Churn Creek. A feasibility study for the dewatering project was completed by WaterWorks Engineers in May 2012, and the City is in the process of securing funding for the project in order to ensure completion by the March 30, 2017, deadline.

The City has an executed long-term (40-year) water transfer agreement with the Anderson-Cottonwood Irrigation District, which has a diversion below the dam. This agreement provides for the transfer of up to 2,000 acre-feet (AF) per year of Central Valley Project (CVP) water above the dam to the City's intakes. The BOR has not approved this transfer because of purported impacts to the cold water pool (CWP) under some water supply scenarios.

The City's challenge and goal has been to use the most cost effective method to maintain the integrity of the CWP while protecting the City against a water shortage during drought periods and preparing for inevitable growth. The City has investigated several options to meet this goal; however, the methods investigated to date either would not fully mitigate the depletion of the CWP or are not economically feasible. In addition, as documented in the City's 2004 update to the Master Water Plan (*Evaluation of Feasibility for Ground-Water Supply for the City of Shasta Lake*), the geology under the city precludes the development of any commercially viable groundwater wells. The City relies solely on surface water allocations and transfers.

The City is in the process of applying for grant funding to study the feasibility of utilizing a local water district's water treatment and distribution systems with an intertie to the City, which would allow diversion of the ACID allocation without impacting the CWP. In addition, in the City's September 25, 2013, comment letter to the BOR for the Draft Environmental Impact Statement for the Shasta Lake Water Resources Investigation, the City requested BOR dedicate 4,600 AF of the newly impounded water to the City's base allocation of 4,400 AF, increasing its total long-term allocation to 9,000 AF. In addition, the WTP dewatering project discussed under Section 4.10.1.1 above will result in a reduction of potable water use of approximately 40 AF per year.

See **Figure 4.10-1** for the proposed project's water infrastructure and connectivity to the City's water system.



NOT TO SCALE



Figure 4.10-1
Mountain Gate at Shasta, Water Infrastructure

PMC

4.10 UTILITIES AND SERVICE SYSTEMS

4.10.1.2 REGULATORY FRAMEWORK FOR WATER SERVICE

STATE

Urban Water Management Planning Act

The Urban Water Management Planning Act (Water Code Sections 10610–10656) requires every urban water supplier that either provides over 3,000 acre-feet of water annually or serves more than 3,000 connections to assess the reliability of its water sources over a 20-year planning horizon considering normal, dry, and multiple dry years. This assessment is to be included in an Urban Water Management Plan (UWMP); these plans are required to be prepared every five years and submitted to the Department of Water Resources (DWR 2011).

Senate Bill 610 and Senate Bill 221

Senate Bill (SB) 610 (Water Code Section 10910) and SB 221 (Business and Professions Code Section 11010 and Government Code Sections 65867.5, 66455.3, and 66473.7) amended state law, effective January 1, 2002, to improve the link between information on water supply availability and certain land use decisions made by cities and counties. SB 610 and SB 221 are measures that seek to promote more collaborative planning between local water suppliers and cities and counties by requiring that detailed information regarding water availability be provided to decision-makers prior to approval of specified large development projects. SB 610 requires that detailed information be included in a water supply assessment (WSA), which is then included in the administrative record that serves as the evidentiary basis for an approval action by the city or county. SB 221 requires that the detailed information be included in a verification of water supply during the final map stage of projects and therefore not discussed further in this EIR.

Under SB 610, WSAs must be furnished to local governments for inclusion in any environmental documentation for the following projects (as defined in Water Code Section 10912[a]) subject to the California Environmental Quality Act (CEQA):

- A proposed residential development of more than 500 dwelling units;
- A proposed shopping center or business establishment employing more than 1,000 persons or having more than 500,000 square feet of floor space;
- A proposed commercial office building employing more than 1,000 persons or having more than 250,000 square feet of floor space;
- A proposed hotel or motel, or both, having more than 500 rooms;
- A proposed industrial, manufacturing, or processing plant, or industrial park planned to house more than 1,000 persons, occupying more than 40 acres of land, or having more than 650,000 square feet of floor area;
- A mixed-use development that includes one or more of the uses described above;
- A development that would demand an amount of water equivalent to or greater than the amount of water required by a 500 dwelling-unit project; and
- For lead agencies with fewer than 5,000 water service connections, any new development that will increase the number of water service connections in the service area by 10 percent or more.

According to SB 610 (Water Code Section 10910(C)(3), "If the projected water demand associated with the proposed project was not accounted for in the most recently adopted urban water management plan, or the public water system has no urban water management plan, the water assessment for the project shall include a discussion with regard to whether the public water system's total projected water supplies available during normal, single dry and multiple dry water years during a 20-year projection will meet the projected water demand associated with the proposed project, in addition to the public water system's existing and planned future uses, including agricultural and manufacturing uses."

The WSA for the proposed project is included as **Appendix 4.10-1**.

State Water Resources Control Board

The State Water Resources Control Board (SWRCB) administers state water rights and water quality functions. The SWRCB and its nine Regional Water Quality Control Boards administer water rights and enforce pollution control standards throughout the state. The SWRCB is responsible for granting water rights following public hearings and appropriate environmental review by applicants and responsible agencies. In granting water rights permits, the SWRCB must consider all beneficial uses, including water for downstream human and environmental needs. In addition to granting water rights, the SWRCB also issues water quality related certifications to developers of water projects under Section 401 of the federal Clean Water Act.

Central Valley Regional Water Quality Control Board

The City of Shasta Lake is located within the boundaries of the Central Valley Regional Water Quality Control Board (Central Valley RWQCB), which issues the necessary permits required to produce and distribute recycled water and enforces Title 22 regulations set forth by the California Department of Health Services. Daily self-monitoring by the individual water companies is required to ensure water quality standards are being met. Data from daily monitoring is compiled into reports and filed with the RWQCB.

LOCAL

Shasta Lake Master Water Plan

In 2004, the City updated its 1998 Master Water Plan, which compared current water supplies with existing and anticipated water demands. The plan also identifies improvements needed to the water treatment and distribution system.

Shasta Lake Water Conservation Plan

In 2000, the City prepared a Water Conservation Plan in an effort to encourage and promote water conservation throughout the City's service area. The Conservation Plan includes Best Management Practices for Urban Water Suppliers and incorporates the City's Water Shortage Contingency Plan.

Shasta Lake Water Shortage Contingency Plan

The City adopted a Water Shortage Contingency Plan in 1994. This Plan was incorporated into the Water Conservation Plan and establishes water rationing stages and reduction goals to be undertaken in response to water supply shortages. The Contingency Plan includes a four-stage

4.10 UTILITIES AND SERVICE SYSTEMS

drought management plan that includes voluntary and mandatory stages, depending on the amount of BOR's water allocation reduction. Customers are required to reduce their use of potable water from 15 percent to 50 percent to offset BOR's reduction to the City's water allocation.

City of Shasta Lake General Plan

The primary guide to future land development in the undeveloped areas of the city is the City of Shasta Lake General Plan. State law requires that all local governments prepare a general plan for future development in their jurisdictions. The City's current plan was adopted in 1994 and revised in 1999. **Table 4.10.1-1** analyzes the project's consistency with General Plan goals, objectives, and policies pertaining to water resources. While this Draft EIR analyzes the project's consistency with the General Plan pursuant to CEQA Section 15125(d), it is the City of Shasta Lake Planning Commission and/or City Council that will make the determination of the project's consistency with the identified General Plan policies.

TABLE 4.10.1-1
PROJECT CONSISTENCY WITH CITY OF SHASTA LAKE
GENERAL PLAN: WATER RESOURCES

General Plan Objectives & Policies	Consistent with General Plan?	Analysis
Land Use Policies		
LU-4 Guide development in a pattern that will establish an acceptable balance between public facility and service costs and public revenues derived from new development.	Yes	The Area Plan policies within the Mountain Gate at Shasta Area Plan, under Policy Section 3.1, General Policies, Policy 5 states, "Each development proposal or phase shall, as a condition of occupancy, install the portions of infrastructure required to serve the project, at the developer's expense, or based on an approved public financing method, such as assessment district."
Water Resources Objectives		
W-1 Conserve and manage all surface and groundwater resources so that all City residents, both now and in the future, have reasonable assurances that an adequate quantity and quality of water exists.	Yes	All parcels within the Mountain Gate at Shasta Area Plan would have access to public water.
Public Facilities Objectives		
PF-5 Encourage water conservation in all new development through the use of measures which result in the more efficient use of water.	Yes	The Area Plan's Policy Section 3.7, Wastewater, Policy 2 states, "To the extent feasible, reclaimed (treated) wastewater should be used within the project boundaries." In addition, the project will comply with the City's Water Efficient Landscape Ordinance and California Building Codes designed to reduce the demand for potable water.
PF-6 Encourage the use and expansion of recycled wastewater for irrigation purposes.	Yes	See consistency analysis for Objective PF-5.
Public Facilities Implementation Measures		
PF-(2) Explore the feasibility of a drainage fee to fund storm water drainage and ongoing	Yes	The Area Plan identifies the operating and maintenance of public services and facilities

General Plan Objectives & Policies	Consistent with General Plan?	Analysis
maintenance. Require all new development to pay this fee as a condition of project approval.		through public and private financing.
PF-(4) Explore the feasibility of using reclaimed water for landscaping of residential landscaping in new subdivisions, major commercial and industrial projects, and landscaping at public facilities, including schools, government facilities, parks and golf courses.	Yes	See consistency analysis for Objective PF-5.
PF-(5) Establish guidelines and standards for water conservation and actively promote use of water-conserving devices and practices in both new construction and major alterations and additions to existing buildings.	Yes, with mitigation	See mitigation measure MM 3.13.2 in Section 4.13, Greenhouse Gases and Climate Change.
PF-(7) Evaluate, and if feasible, implement a requirement that new development pay its fair share of costs associated with the provision and maintenance of streets, parks, water supply and treatment, wastewater treatment and disposal, drainage, and facilities for police and fire protection.	Yes	The Area Plan states that public facilities will be adequately financed and constructed in a timely manner through private revenue sources.
PF-(8) Evaluate and adopt an “adequate public facilities and services” ordinance, or other regulatory mechanism, establishing a procedure for reviewing major development applications and requiring a determination as a condition of approval that: Adequate public facilities and services would be available at the time of project occupancy and performance standards maintained following project occupancy; or Funds for required improvements are assured and that improvements would be completed within a stipulated time of project occupancy.	Yes, with mitigation	As noted above, the Area Plan states that public facilities will be adequately financed and constructed in a timely manner by public and private financing. Also see mitigation measure MM 4.10.1.1.

Other Local Regulations

Title 22 of the California Code of Regulations gives local fire agencies the authority to require minimum fire flows, pressures, and durations.

4.10.1.3 IMPACTS AND MITIGATION MEASURES FOR WATER SERVICE

Impacts and mitigation measures associated with the proposed water facilities are described in this section.

4.10 UTILITIES AND SERVICE SYSTEMS

STANDARDS OF SIGNIFICANCE

Significance Criteria

The impact analysis provided below is based on the following State CEQA Guidelines Appendix G thresholds of significance, which state that a project would have a significant impact if it would:

- 1) Have insufficient water supplies available to serve the project from existing entitlements and resources, or if new or expanded entitlements are needed.
- 2) Require or result in the construction of new water treatment facilities or expansion of existing facilities, the construction of which would cause significant environmental effects.

The reader is referred to Section 4.7, Hydrology and Water Quality, regarding hydrological and water quality-related impacts and a discussion of groundwater resources.

METHODOLOGY

The Area Plan includes diagrammatic representations of the utilities needed to serve buildout of the proposed project. As proposed, development will occur in phases, and each phase will need to provide detailed engineering-level plans for all utilities. This is a normal function of the subdivision process. The first phase of the Area Plan provides for the division of the property into 21 parcels, which includes the major roadway network. The following analysis concentrates on the overall utility plan and assumes that existing City ordinances and policies will apply when processing subsequent development requests.

IMPACTS AND MITIGATION MEASURES

Available Water Supplies Available to Serve the Project (Standard of Significance 1)

Impact 4.10.1.1 Buildout of the project would require the use of water supplies, which may exceed the City of Shasta Lake's current water allotment during drought conditions. This impact is considered **potentially significant**.

The Water Supply Assessment prepared for the proposed project (**Appendix 4.10-1**) shows that the City has long-term water contracts that can provide up to 6,755 acre-feet per year. Water demand, as shown in **Table 4.10-2**, has averaged 2,354 acre-feet over the previous five years. The City has an available water supply to provide an additional 4,401 acre-feet per year.

**TABLE 4.10-2
HISTORIC WATER PRODUCTION AND DELIVERY**

	Population	Residential Customers/ Meters	Commercial Customers/ Meters	Total Customers	Units of Production (AF)	Water Delivered to Customers (AF)
2009	10,269	3,501	197	3,698	2,957	2,501
2010	10,164	3,450	203	3,653	2,572	2,285
2011	10,102	3,443	204	3,647	2,493	2,177
2012	10,077	3,458	202	3,660	2,826	2,399
2013	10,100	3,478	197	3,675	2,610	2,407
2011 – 2013 Three-Year Average						
Units of Production:		2,643 AF				
Water Delivered:		2,328 AF				
2009 – 2013 Five-Year Average						
Units of Production:		2,692 AF				
Water Delivered:		2,354 AF				

Source: Population: DOF 2009 - 2013; Water production: City of Shasta Lake 2009-2013

The proposed project site was included in the Master Water Plan calculations of demand with a total unit demand of 2,141 household equivalents (HE) or approximately 1,919 AF of water per year.¹ The Plan projected an HE as 500 gallons per home per day and then used a multiplier of 1.6 to account for higher water usage in new homes. This factor was raised even higher for areas where larger lots are anticipated because larger lots have historically used more water.

Therefore, the City uses 800 gallons per day per single-family HE as an estimate for water demand, even though new mandatory measures for water efficiency and conservation have been imposed in the California Green Building Standards Code to reduce the overall use of potable water within the building by at least 20 percent. In addition, the City's Water Efficient Landscape Ordinance was adopted in 2010, recognizing that the largest use of all municipal water is for landscape irrigation. Continued implementation of the Ordinance will ensure that landscaping is designed with water-efficient irrigation systems and drought tolerant plants to reduce water demands.

Table 4.10-3 shows the approximate acre-foot water demand for the project as calculated using the above assumptions. Water demand for commercial uses was calculated using 7 HEs per acre. Water use for high-density areas (multi-family uses) was reduced by 50 percent. Parks were calculated at 650,000 gallons (2 AF) per acre per year. The Fire Station was assigned a range of 2 – 3 HEs.

Table 4.10-3 also includes other projects that are approved but not yet constructed. The City does not reserve water connections and evaluates each request at the time of entitlement. For purposes of this EIR, the analysis includes water demand from the proposed project and the approved projects in the calculation.

¹ For purposes of this water supply assessment, the HE was used to calculate assumed acre-feet (2,141 x 800 gallons per day x 365 days/325,851 gallons in each acre-foot = 1,919 acre-feet per year).

4.10 UTILITIES AND SERVICE SYSTEMS

TABLE 4.10-3
ESTIMATED WATER DEMAND IN ACRE-FEET PER YEAR

Area	Primary Land Use	Acres	Water Need (AF)	
			Low	High
A	Commercial	11.2	70	70
B	Open Space	181.5	—	—
C	Park	7.3	15	15
D	Medium Density Residential	27.9	100	158
E	Medium Density Residential	22.5	81	127
F	Very Low Density Residential	16.3	14	27
G	Medium Density Mixed Use	43.5	156	351
H	Mixed Use Commercial	3	19	19
	High Density Mixed Use	11.9	59	96
	Fire Station	2	2	3
I	Medium Density Residential	7.3	26	41
J	Medium Density Residential	8.1	29	46
K	Park	7.6	15	15
L	Low Density Residential	17.1	30	55
M	Community Park	13	26	26
	Low Density Residential	19.4	35	63
N	Low Density Residential	11.3	21	37
O	Low Density Residential	13.1	23	42
P	Low Density Residential	32.9	59	107
Q	Very Low Density Residential	10.4	9	17
	Electric Substation	2	—	—
R	High Density Residential	4.5	22	55
S	Very Low Density Residential	40.5	37	65
T	Open Space	5.9	—	—
U	Open Space	33.6	—	—
ROW	Rights-of-Way	36.2		
Totals		590	848	1,434

Other Approved Projects				
	Project	Undeveloped Lots Remaining		Water Need (AF)
SD 02-01	Windsor Estates II	38		34
SD 03-02	Oak Ridge Subdivision (Karem)	28		25
SD 04-01	Mountain Properties (Jaxon Baker)	164		147
SD 04-04	Kingston Estates (Tatom)	10		9
SD 05-01	Riddle Road Subdivision (Woolery)	21		19
SD 03-01	Deer Creek Manor	84		75
	Misc. Parcel Maps	19		17
Totals		364		326
			Low	High
Total Water Demand (AF) for Proposed and Approved Projects			1,174	1,760

Source: Water Supply Assessment (Appendix 4.10-1)

As shown in **Table 4.10-3**, the total demand on the City's water system from the proposed project and other approved projects is between 1,174 and 1,760 acre-feet per year at full buildout. This is less than the assumed 1,919 acre-feet demand for the proposed project site assumed in the Master Water Plan and less than the available water supply of 4,401 acre-feet per year. The total water demand from **Table 4.10-3** (high demand) and the existing five-year average shown in **Table 4.10-2** is 4,114 acre-feet per year, which is less than the total 6,755 acre-feet of water under long-term contract with the City. As a result, during normal water years, the impact of the proposed project on water supplies is **less than significant**.

WATER SUPPLY DURING WATER EMERGENCY (DROUGHT) CONDITIONS

Bureau of Reclamation Allocation / Drought Reductions

Pursuant to BOR's Water Shortage Policy (2005), BOR may temporarily reduce the City's allocation of CVP water during any year based on the average of the most recent three years of water deliveries. The amount of the reduction is based on the City's water produced rather than water metered and delivered to customers. The reduction may also be adjusted based on population growth and demands of industrial, commercial and other entities to address demand increases that might not be reflected in the three-year average. In addition, the reduction may be adjusted for extraordinary water conservation measures and to address health and safety issues.

In March 2008, the BOR announced an update to the CVP water supply allocation due to drought conditions. The City's water allocation was reduced to approximately 2,280 AF, which represented a reduction of 25 percent from the City's three-year historic use average at the time. Following BOR's 2008 announcement, the City entered into a short-term agreement with the McConnell Foundation for the purchase of 700 AF of water, bringing the City's total water supply to approximately 3,120 AF, which included 140 AF of ACID water.

4.10 UTILITIES AND SERVICE SYSTEMS

In February 2009, BOR's initial projections indicated a possible 40-50 percent reduction to the City's allocation. In March 2009, the City declared a water shortage emergency, and the City's water use restrictions were put into effect. The City purchased 1,400 AF of supplemental water from the McConnell Foundation. In June 2009, BOR announced that the City's allocation would be reduced by 25 percent, for a total allocation of 2,218 AF.

For water year 2010, BOR announced the City would receive 100 percent of its allocation. At that time, the City rescinded the resolution declaring a water shortage emergency. The City also received its full allocation for water years 2011, 2012 and 2013.

For 2014, BOR's initial projections in February 2014 again indicate the possibility of reducing the City's allocation by 50 percent due to the current drought situation. However, BOR will not make a final determination regarding this year's allocation until the end of the wet weather season in May.

The City is in negotiations with the McConnell Foundation to purchase up to 1,300 AF of supplemental water for 2014. The amount of water purchased will depend on BOR's final determination regarding allocation reductions. Based on the figures shown in **Table 2**, the average City water produced from 2011 through 2013 was 2,643 AF. A reduction of 25 percent would result in an allocation of approximately 1,982 AF of water. A reduction of 50 percent would result in an allocation of approximately 1,322 AF (Also see **Table 7**)

City's Water Conservation Plan

The City has an adopted Water Conservation Plan (2000) which incorporates the City's Water Shortage Contingency Plan (1994). The Contingency Plan includes a four-stage drought management plan that includes voluntary and mandatory stages, depending on the amount of BOR's water allocation reduction. Customers are required to reduce their use of potable water from 15 percent to 50 percent to offset BOR's reduction to the City's water allocation. **Table 4.10-4** shows calculations based on the three-year water supply averages shown in **Table 4.10-2**.

TABLE 4.10-4
POTABLE WATER RATIONING

Three-Year Average (2,643 AF)			
Stage	Demand Reduction	Program Type	Water Use Reduction AF per Year
1	15%	Voluntary	396
2	25%	Mandatory	661
3	35%	Mandatory	925
4	50%	Mandatory	1,322

Section 13.12.400 of the City of Shasta Lake Municipal Code (SLMC) establishes a process whereby the City Council may declare a Water Shortage Emergency. Most recently, a public hearing was conducted on March 4, 2014, and City Council adopted a Resolution declaring a Water Shortage Emergency and imposing the following restrictions that apply to all customers in the City. The Resolution also established excess water use penalty fees.

- A. Use of potable water to irrigate turf, ground cover, shrubbery, crops, vegetation, and trees in such a manner as to result in runoff for more than 5 minutes.
- B. Use of potable water to wash sidewalks, walkways, driveways, parking lots, open ground, or other hard surfaced areas except where necessary for public health or safety.
- C. Allowing potable water to escape from breaks within the customer's plumbing system for more than 24 hours after the customer is notified or discovers the break.
- D. Washing cars, boats, trailers, aircraft, or other vehicles by hose without a shutoff nozzle and bucket, except to wash such vehicles at commercial or fleet vehicle washing facilities using water recycling equipment.
- E. No restaurant, hotel, cafe, cafeteria, or other public place where food is sold, served, or offered for sale shall serve drinking water to any customer unless expressly requested.
- F. Use of potable water for construction, compaction, dust control, street or parking lot sweeping, or building wash-down where nonpotable or recycled water is sufficient.
- G. Use of potable water for sewer system maintenance or fire protection training without prior approval by the city engineer.
- H. Use of potable water to fill or maintain levels in swimming pools, decorative fountains, ponds, or evaporative coolers unless a recycling system is used.

Pursuant to SLMC Section 13.12.401, any customer violating these restrictions is subject to penalties. These penalties could include the requirement for a flow-restrictor to be installed in the water service at the customer's cost. Repeated violations would be considered a misdemeanor and may be referred to the District Attorney's office for prosecution. In addition this Code section states the City may disconnect the water service if the customer refuses to comply with the restrictions during the Water Shortage Emergency.

In addition, the City Council may adopt by resolution other restrictions necessary to safeguard the adequacy of the water supply for domestic, sanitation, fire protection, and environmental requirements.

Based on the figures shown in **Table 4.10-2**, the average City units of water production from 2011 through 2013 was 2,643 acre-feet. As stated in above, BOR may reduce the City's water allocation in any year based on the average water produced over the prior three years. The three-year average will likely increase each year as development and water demands increase. **Table 4.10-5** shows the impact of reductions in the BOR water allocations based on the three-year average from 2011 - 2013. As shown in the table, there is insufficient water to meet current demand if the City's allocation is reduced. However, as stated above, the City is in negotiations with the McConnell Foundation to purchase up to 1,300 AF of supplemental water for 2014.

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TABLE 4.10-5
IMPACT OF BOR REDUCTION BASED ON CURRENT (2013) DEMAND OF 2,407 AF

Three-Year Average (2,643 AF)			
BOR Reduction	Total Reduction (AF)	Available Supply with Reduction	Balance of Available Water Based on Current (2013) Demand of 2,407 AF
15%	-396	2,247	-160
25%	-661	1,982	-425
35%	-925	1,718	-689
50%	-1,322	1,322	-1,085

In addition, if the City declares a Stage 3 or 4 Water Shortage Emergency pursuant to the Water Shortage Contingency Plan, mandatory rationing by all customers will offset the water supply deficiencies. For example, landscape irrigation accounts for 57 percent of residential water use in California, which equates to 456 gallons per day (800 gallons per day x 0.57=456; 166,440 gallons per year) per single-family home in the city. During a drought condition, landscape irrigation can be reduced to approximately 152 gallons per day if lawns are not watered. This is a savings of 304 gallons of water per single-family household equivalent per day, or a reduction of 110,960 gallons per household per year. These numbers assume lawn covers approximately 50 percent of the planted portion of a yard and trees and shrubs cover the remaining 50 percent.

The water demand for lawn is over twice that of shrubs and trees with comparable density and microclimate factors. Based on the above, during severe drought conditions a prohibition on lawn watering would reduce water usage sufficiently to meet a Stage 4 condition as shown in **Table 4.10-4**. Stage Three Water Emergency Regulations included in the Water Shortage Contingency Plan include a prohibition of residential and commercial landscaping and/or lawn irrigation with potable water.

While there is sufficient water supply during normal water years, severe drought conditions might result in insufficient water to meet existing demand. The City's Water Shortage Contingency Plan does not have sufficiently quantified water conservation measures to demonstrate that reductions in water usage would result in adequate water supply during drought conditions, providing rather an estimate of expected conservation of City Monthly AF (Stage One: 0-15% expected conservation; Stage Two: 15-25%; Stages Three and Four: 25-40% expected conservation). Additional water conservation measures could be enacted that would likely result in sufficient water conservation.

The proposed project includes subdivision of the property into 21 large lots, but does not allow for development without further entitlements (e.g., additional tentative subdivision maps or other discretionary approvals). Mitigation measure **MM 4.10.1.1** requires that water supply be verified prior to approval or any subsequent project. If a project is proposed during a water emergency, the City has the ability to deny or delay the approval until water supply is assured. Prohibiting future development would reduce the demand for water during the water emergency and would not result in further impacts to the City or the water system.

Mitigation Measures

MM 4.10.1.1 Prior to approval of subsequent development (i.e., further division of the property, conditional use permit, etc.), the project applicant must demonstrate water supply availability. The City may delay or deny subsequent projects based on water availability or drought conditions in effect at the time of project consideration.

Timing/Implementation: Prior to approval of subsequent tentative subdivision maps or other discretionary approvals.

Enforcement/Monitoring: City of Shasta Lake Development Services Department

The proposed project results in large parcels intended for subsequent land division and development. As shown in this section, during normal water years there is sufficient water supply to meet the needs of the project. It is possible that subsequent projects may be proposed during drought years and that there would be insufficient water to meet project needs. As the City has a single water source that is regulated by the BOR, the only feasible mitigation during drought years is to delay project approvals until the water supply returns to normal. As mitigation measure **MM 4.10.1.1** does not increase the amount of water or reduce the water demand to the levels discussed in this section, this impact is considered **significant and unavoidable**.

Require or Result in the Construction of New Water Allocation, Distribution, Storage, and Treatment Facilities or Expansion of Existing Facilities (Standard of Significance 2)

Impact 4.10.1.2 Buildout of the project would require water system upgrades and the construction of a reservoir, booster pump station, and other improvements to serve the project site. This impact is considered **less than significant**.

The Mountain Gate at Shasta Area Plan will require a number of improvements to the City's water system to serve the project. This includes an on-site booster pump station near Reservoir Nos. 3A and 3B. To provide water to the reservoir, the project will also require the installation of a new 16-inch water main within Black Canyon Drive (see **Figure 4.10-1**).

The City of Shasta Lake's Master Water Plan states that a 1.0-million-gallon reservoir with a maximum water surface elevation of about 1,010 feet needs to be constructed to ensure adequate water supply for the northerly two-thirds of the proposed Mountain Gate project. According to the Master Water Plan, the bottom of the tank must be constructed at a minimum elevation of 985 in order to operate as a gravity system. The Master Water Plan shows this new reservoir located outside of the city limits approximately 1,400 feet northwest of the project boundary (APN 307-200-180) on property currently owned by 3M Corporation.

This site was identified by the City during preparation of the Master Water Plan because it satisfied the criteria for the tank location. In the event the developer and/or City is/are unable to acquire the land for the tank site and easements for water mains to provide water to the tank as well as a water main from the tank to the Mt. Gate property an alternative on-site location has been identified for the water tank.

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The alternative on-site water tank would be located just south of the project's north boundary line as shown on Figure 4.10.1. The proposed on-site tank would be located on a knoll with an elevation of only 895, approximately 90 feet below the required minimum location for the tank to operate as a gravity tank. Due to the lower elevation of this alternative site, this location would require the construction of a booster pump system in order to provide adequate pressure to the zone which it will serve. This alternative tank location can be fed with water mains through the project site avoiding the need to obtain easements for the system to serve the Mountain Gate at Shasta project.

With the exception of the new reservoir and approximately 500 feet of waterline, the water system improvements would occur within the road right-of-way of Black Canyon Road. Construction of the waterline would require repairs to the roadway, as well as standard mitigation measures for erosion and dust control (see Section 4.4, Air Quality). Installation of new pipeline consistent with the Master Water Plan is not considered a significant environmental impact. Construction of the 500 feet of pipe that is not within Black Canyon Road, as well as the reservoir, would occur in previously undisturbed areas of the city. The biological impacts of the waterline and reservoir are discussed in Section 4.6 of the DEIR, while cultural resource impacts are discussed in Section 4.9. Aesthetic impacts are identified in Section 4.12. The environmental effects of the construction of a new reservoir and 500 feet of pipe off-site have been addressed, and this impact is **less than significant**.

Mitigation Measures

None required.

4.10.1.4 CUMULATIVE SETTING, IMPACTS, AND MITIGATION MEASURES FOR WATER SERVICE

CUMULATIVE SETTING

The cumulative setting for water resources includes the 10.8-square-mile service boundaries of the City of Shasta Lake water service area, which covers the city limits of the City of Shasta Lake. There are 50 projects identified in the 2004 update to the 1998 Master Water Plan. These projects, in addition to future projects, would cumulatively increase water demand.

CUMULATIVE IMPACTS AND MITIGATION MEASURES

Cumulative Water Service

Impact 4.10.1.3 Implementation of the proposed project, in combination with cumulative development, would increase the current demand for water supply service. This impact is considered to be **cumulatively considerable**.

As discussed above, there is sufficient long-term contract water to meet the needs of the City and the proposed project. The Master Water Plan predicts that over time the city's growth in population and water demand will result in the need for additional water. The proposed project was included in the Master Water Plan, and the water usage projected in **Table 4.10-3** is less than the estimate provided in the Master Water Plan.

However, during drought conditions it is likely that there will be insufficient water to meet the combined project and city needs. Implementation of mitigation measure **MM 4.10.1.1** would not result in an increased water supply to meet the needs of the City; however, it does ensure that

development could not be constructed during drought conditions. This DEIR assumes that drought conditions would occur periodically over time, but would not be a permanent condition. As such, the City's long-range water planning is intended to ensure there is sufficient water for the proposed project and the General Plan as a whole. As the proposed project water demand is consistent with the long-range water planning provided by the City of Shasta Lake, this impact is considered **significant and unavoidable**.

Mitigation Measures

Implementation of mitigation measure **MM 4.10.1.1**.

4.10.2.1 EXISTING SETTING FOR WASTEWATER

The wastewater treatment plant (WWTP) is located at the end of Tibbitts Road, off Ashby Road near Shasta Gateway Industrial Park. The WWTP is owned and operated by the City and serves only the City. The Summit City area and the Riddle Road area are not currently served by sewer.

The WWTP was designed for an average dry weather flow (ADWF) of 1.3 MGD and a peak wet weather flow of 5.2 MGD. The Plant was also designed and constructed in anticipation that the plant would eventually be expanded to 2.3 MGD.

The WWTP was designed to meet the higher level California Department of Health Services Title 22 reclamation requirements to be able to provide reclaimed water to customers for reuse (e.g., reclaimed water is provided to Caltrans and Knauf Insulation for landscape irrigation; Sierra Pacific uses it in their manufacturing process). Reclaimed water from the City's WWTP could also be used for golf course irrigation, food crops, including all edible root crops, parks and playgrounds, school yards, and residential landscaping.

One challenge the City is currently facing is new state regulations that limit the City's ability to discharge reclaimed water from the WWTP to Churn Creek. Reclaimed water that cannot be discharged to Churn Creek is stored in the 410-acre-foot City-owned reclaimed water storage reservoir until such time that it can be released in conformance with Central Valley RWQCB dilution requirements. The reclaimed water storage reservoir is too small to accommodate the theoretical storage that is required to handle the WWTP's design flow during a drought year. The City has the ability to distribute treated effluent through a "purple pipe" to various points in the city. The purple pipe currently terminates at the southerly boundary of the project site.

The City's WWTP is currently covered under RWQCB Order R5-2008-0037 (National Pollutant Discharge Elimination System [NPDES] CA 0079511). The NPDES permit required the City to complete a mixing zone study and dilution study for Churn Creek. The study, completed in June 2010, showed the WWTP outfall to Churn Creek does not meet the Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays and Estuaries of California (State Implementation Policy) criteria for a mixing zone. Therefore, the City's WWTP does not qualify for future dilution credits.

The RWQCB required the City to address the removal of dilution credits and provide a plan for compliance with future permit limits. A Development Design Report, dated January 2013, was prepared for the City by Waterworks Engineers for improvements to the WWTP that would enable the City to meet projected new effluent limits reflecting zero dilution credits. This would allow direct discharge to Churn Creek year around.

On December 20, 2013, the RWQCB issued a preliminary draft of the City's new NPDES permit and Time Schedule Order (TSO) for the WWTP. The TSO provides a five-year time schedule for

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completion of the WWTP improvements. The public hearing before the RWQCB for adoption of the permit and TSO was held on March 27, 2014.

In March 2014, the City entered into a contract with Analytical Environmental Services (AES) to prepare environmental compliance documentation related to the upgrade of the WWTP pursuant to the RWQB's "*Environmental Review Process Guidelines for State Revolving Fund (SRF) Loan Applicants.*" AES will assist the City with documents needed in order to apply for SRF funding for completion of this project.

The City is also researching potential funding sources for this project in an effort to reduce financial impacts to residents and developers in the city that will result from these new state requirements. Other possible funding options include the U.S. Environmental Protection Agency's State Revolving Fund program, U.S. Department of Agriculture's Rural Development program, BOR's Title XVI program, U.S. Department of Housing and Urban Development Community Development Block Grant funds, State Small Communities Grant, and Proposition 84 and Proposition 50 programs.

The timeline for completion of the environmental compliance documents and permit application is January 2015. Pursuant to the TSO time schedule, funding for the project will be secured for final design, construction and operation of the facility by December 31, 2016. The anticipated construction year is 2017.

Completion of this project is crucial in order to accommodate future development in the city. Currently, the WWTP is at 88 percent of operational capacity and can accommodate approximately 415 additional household equivalents (HEs) due to limitations on disposal of reclaimed water. Completion of the WWTP project will restore the WWTP to its original design capacity of 1.3 MGD, enough to accommodate a total of approximately 6,436 household equivalents. The WWTP currently accommodates a total of approximately 3,786 HEs; therefore, there are approximately 2,650 HEs remaining. The City will continue to monitor development and track additional connections to the City's wastewater facilities to ensure the City remains in compliance with the RWQCB order.

The Design Development Report prepared by Waterworks Engineers in January 2013 indicated there were 3,291 sewer connections of which 134 were commercial and 3,157 were residential. Based on the Average Dry Weather Flow of 0.64, there is approximately 202 GPD of wastewater production per Household Equivalent (HE). This is less than the 240 GPD of wastewater production per HE described in the City's Wastewater Master Plan. The Master Plan was based on 1997 City data, and more recent data suggests 202 GDP per HE is more representative of current conditions. However, for purposes of this analysis, future demand is based on 240 GPD.

City of Shasta Lake

The City currently maintains approximately 270,000 feet of gravity sewer line, seven raw sewage lift stations, 18,000 feet of force mains, and one wastewater treatment plant. A plan of the city's existing wastewater system is shown on **Figure 4.10-2**. The City of Shasta Lake's sewer collection system consists primarily of 6- and 8-inch-diameter collection sewers and 10- to 12-inch-diameter interceptor sewers. The collection system has a very high infiltration and inflow (I&I) rate due to the age of the system and materials used in the construction of the original system.

The city's topography generally slopes from north to south, but the WWTP is located on relatively high ground in the southwest quadrant of the service area. As a result, all of the raw sewage must be pumped to the treatment plant by lift stations.

4.10.2.2 REGULATORY FRAMEWORK FOR WASTEWATER SERVICE**FEDERAL**

In 1972, the Clean Water Act (CWA) was adopted to protect the waters of the nation. The U.S. Environmental Protection Agency (EPA) and corresponding state agencies regulate public wastewater systems to ensure compliance with the CWA. To implement the CWA regulatory standards, the National Pollutant Discharge Elimination System (NPDES) Permit Program was instituted.

The CWA requires that all point sources discharging pollutants into waters of the United States obtain a NPDES permit. By point sources, the EPA means discrete conveyances such as pipes or man-made ditches. Although individual households do not need permits, facilities must obtain permits if their discharges go directly to surface waters. Some pollutants that may threaten public health and the nation's waters are human wastes, ground-up food from sink disposals, laundry and bath waters, toxic chemicals, oil and grease, metals, and pesticides.

STATE**State Water Resources Control Board**

The State Water Resources Control Board (SWRCB) was created by the California Legislature in 1967. The mission of the SWRCB is to ensure the highest reasonable quality for waters of the State, while allocating those waters to achieve the optimum balance of beneficial uses. The joint authority of water allocation and water quality protection enables the SWRCB to provide comprehensive protection for California's waters.

There are nine Regional Water Quality Control Boards (RWQCBs). The mission of the RWQCBs is to develop and enforce water quality objectives and implementation plans, which will best protect the beneficial uses of the state's waters, recognizing local differences in climate, topography, geology, and hydrology.

The City of Shasta Lake falls within the Central Valley RWQCB's jurisdiction. The Central Valley RWQCB covers the Central Valley and extends from north of Redding to the California-Oregon border to south of Fresno covering most of Kern County. The Central Valley RWQCB regulates the discharge of waste to surface waters (rivers, streams, lakes, wetlands, and the Pacific Ocean) as well as to storm drains, to the ground surface, and to groundwaters.

The Central Valley RWQCB implements the NPDES program. NPDES permits, also referred to as waste discharge requirements, are issued to regulate the discharge of municipal wastewater or industrial process cleaning or cooling wastewater, commercial wastewater, treated groundwater from cleanup projects, or other wastes to surface waters only. If the waste discharge consists only of non-process stormwater, it may be regulated under the NPDES stormwater program. The discharge of waste to the ground surface or to groundwater is regulated under the Non-Chapter 15 Permitting, Surveillance, and Enforcement Program. General NPDES permits are issued under the Spills, Leaks, Investigations and Cleanup (SLIC) program to regulate the year-round discharge to surface waters of highly treated groundwater extracted from cleanup projects involving volatile organic compounds.

All municipalities within the Central Valley Region that discharge wastewater to surface waters are currently regulated by NPDES permits issued by the Regional Water Quality Control Board. Industrial, commercial, cleanup, or other operations that discharge wastes directly into municipal or other publicly owned wastewater collection systems are not required to obtain a

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NPDES permit from the RWQCB, but must comply with waste discharge requirements issued by the appropriate public entity.

All NPDES permits issued by the RWQCB include self-monitoring programs that require the permittee to collect pertinent water quality data and to submit it to the RWQCB for evaluation of compliance with the terms of the permit. In addition, RWQCB staff conduct periodic inspections of each permitted discharge to monitor permit compliance.

The RWQCB may take enforcement action in response to significant or chronic permit violations under the authority of the federal Clean Water Act and Amendments, and the Porter-Cologne Water Quality Control Act (California Water Code). Enforcement action can range from Notices of Violation issued by Board staff, to Cleanup and Abatement Orders or Administrative Civil Liability Complaints issued by the RWQCB Executive Officer, to Cease and Desist Orders, Administrative Civil Liability Orders, including civil monetary penalties, or Referrals to the State Attorney General's Office by the RWQCB.

LOCAL

City of Shasta Lake General Plan

The City of Shasta Lake General Plan identifies specific policies regarding public utilities. **Table 4.10.2-1** analyzes the project's consistency with General Plan goals, objectives, and policies pertaining to wastewater. While this Draft EIR analyzes the project's consistency with the General Plan pursuant to CEQA Section 15125(d), it is the City of Shasta Lake Planning Commission and City Council that will make the determination of the project's consistency with the identified General Plan policies.

TABLE 4.10.2-1
PROJECT CONSISTENCY WITH CITY OF SHASTA LAKE
GENERAL PLAN: WASTEWATER AND RECYCLED WATER FACILITIES

General Plan Objectives & Policies	Consistent with General Plan?	Analysis
Public Facilities Objectives		
PF-6 Encourage the use and expansion of recycled wastewater for irrigation purposes.	Yes	The Area Plan's Policy Section 3.7, Wastewater, Policy 2 states, "To the extent feasible, reclaimed (treated) wastewater should be used within the project boundaries."
Public Facilities Implementation Measures		
PF-(4) Explore the feasibility of using reclaimed water for landscaping of residential landscaping in new subdivisions, major commercial and industrial projects, and landscaping at public facilities, including schools, government facilities, parks and golf courses.	Yes	See consistency analysis for Public Facilities Objective PF-6.
PF-(7) Evaluate, and if feasible, implement a requirement that new development pay its fair share of costs associated with the provision and maintenance of streets, parks, water supply and treatment, wastewater treatment and disposal, drainage, and facilities for police and fire protection.	Yes	New development in the City is required to form an assessment district or other funding mechanism to ensure long-term maintenance of public facilities (e.g., Mello Roos District, Lighting and Landscaping District, Drainage Maintenance District, Benefit Assessment District). In addition, the developer is required to construct all infrastructure necessary to

General Plan Objectives & Policies	Consistent with General Plan?	Analysis
		serve the proposed development. Impact fees paid at the time of building permit issuance ensure payment of the development's proportionate fair share of future improvements to the City's water, wastewater, electric, transportation system and parks facilities.

Wastewater System Master Plan

The City of Shasta Lake's first Wastewater System Master Plan was prepared in 2005 and identified inflow and infiltration as an issue with the existing collection system. The plan also indicates that while the existing wastewater treatment plant could be expanded to meet the buildout needs of the General Plan at 4.4 MGD, limitations in the ability to discharge treated effluent would restrict the ability of the plant to grow. The plan recommends that the City seek additional users of reclaimed water or develop a direct discharge to the Sacramento River.

4.10.2.3 IMPACTS AND MITIGATION MEASURES FOR WASTEWATER SERVICE

STANDARDS OF SIGNIFICANCE

The impact analysis provided below is based on the following State CEQA Guidelines Appendix G thresholds of significance, which state that a project would have a significant impact if it would:

- 1) Result in a determination by the wastewater treatment provider, which serves or may serve the project that it has inadequate capacity within the collection system to serve the project's projected demand in addition to the provider's existing commitments.
- 2) Require or result in the construction of new wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects.
- 3) Exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board.

IMPACTS AND MITIGATION MEASURES

Inadequate Capacity of the Wastewater Conveyance and Treatment System Resulting in Construction of New Facilities (Standards of Significance 1 and 2)

Impact 4.10.2.1 Implementation of the proposed Mountain Gate at Shasta Area Plan would require the expansion or alteration of existing wastewater facilities to meet the Area Plan demand. As a result, this impact would be **potentially significant**.

The Master Plan indicates the 2025 flow estimates were based on the projected growth patterns developed during work on the 2004 Master Water Plan Update. The Wastewater System Master Plan assumes a 2.25 percent average annual growth rate and does not include possible sewerage of large areas of existing unsewered development such as the Summit City area within the next 20 years.

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As stated under Section 4.10.2.1, a more recent analysis completed by Waterworks Engineers states the estimates included in the Wastewater Master Plan for wastewater production per household were based on 1997 data, and 202 GPD is more representative of current conditions. However, for purposes of this analysis, calculations are based on 240 GPD.

Based on this criteria, the proposed project under the Area Plan would produce an average flow of 0.42 MGD (240 GPD x 1,604 residential units = 384,960 gallons; 16.02 acres of commercial areas, including the Fire Station x 8 HEs x 240 gallons = 30,758 GPD). This is equal to 1,750 HEs. This is less than the 2,105 HEs assumed in the Wastewater Master Plan for this property. In addition, the Other Approved Projects listed in Table 4.10-3 represent 326 HEs, for a total of 2,076.

According to the Wastewater Master Plan, in 2002, the estimated number of sewer HEs was approximately 3,680. In 2013, the demand was for approximately 3,786 HEs.

The WWTP currently serves a total of approximately 3,786 HEs and can accommodate approximately 2,650 additional HEs. Therefore, capacity in the Wastewater Treatment Plant can accommodate the proposed project and Other Approved Projects included in Table 4.10-3 above.

The Wastewater System Master Plan forecasts infrastructure and facility needs through ultimate buildout conditions identified in the City's General Plan. The Master Plan identified system deficiencies and improvements necessary to meet future populations in the City. The improvements are projected to be constructed within 10–20 years, though there are constraints and, therefore, the timing of improvements cannot be guaranteed.

Collection System

The development of the proposed Mountain Gate at Shasta Area Plan will require improvements to the city's sewer system. The project will require construction of a new lift station near the southerly boundary of the project site as shown on **Figure 4.10-2**. The lift station will tie in to the existing force main that terminates at Cascade Boulevard, north of Shasta Dam Boulevard.

According to the Wastewater System Master Plan, the existing Salt Creek Lift Station was scheduled to be expanded. This expansion will not be able to handle the entire flow from the proposed project. The existing force main from the Salt Creek Lift Station to the treatment plant may not be able to handle the project flows and will be evaluated with the next update to the Wastewater System Master Plan, which is projected to be completed in 2015. A new force main also may be needed, probably following Pine Grove Avenue from the Salt Creek Lift Station to the treatment plant. All of these off-site improvements will be located in previously developed areas and within existing rights-of-way, public utility easements and/or property currently owned by the City.

Finally, the Master Plan shows a 15-inch to 21-inch parallel sewer that was scheduled to be constructed in 2005 in Cascade Boulevard from the intersection at Grand Coulee Boulevard to the Salt Creek Lift Station. According to City staff, rather than a parallel sewer, a new line was installed in Cascade Boulevard, and there is empty pressure and gravity pipe from the Moody Creek Bridge to Pump Station 5 at Salt Creek and Pine Grove. It is anticipated the project will pump to Bonneville Street, then drop into the empty gravity system that goes to Pump Station 5.

See **Figure 4.10-2** for proposed sewer infrastructure.

Treatment Plant and Effluent Disposal

The current design capacity of the city's wastewater treatment plant is 1.3 MGD during the average dry weather flow (ADWF), with a peak wet weather capacity of 5.2 MGD. Currently, the average dry weather flow ranges between 0.8 and 0.9 MGD, with peak wet weather flows approaching 5.0 MGD. According to the 2005 Wastewater System Master Plan, there is physical room at the plant to expand to serve approximately 4.4 MGD. However, the City's ability to expand the capacity of the treatment plant is limited by the discharges allowed into Churn Creek and the unavailability of large reclaimed water users in the area as explained above.

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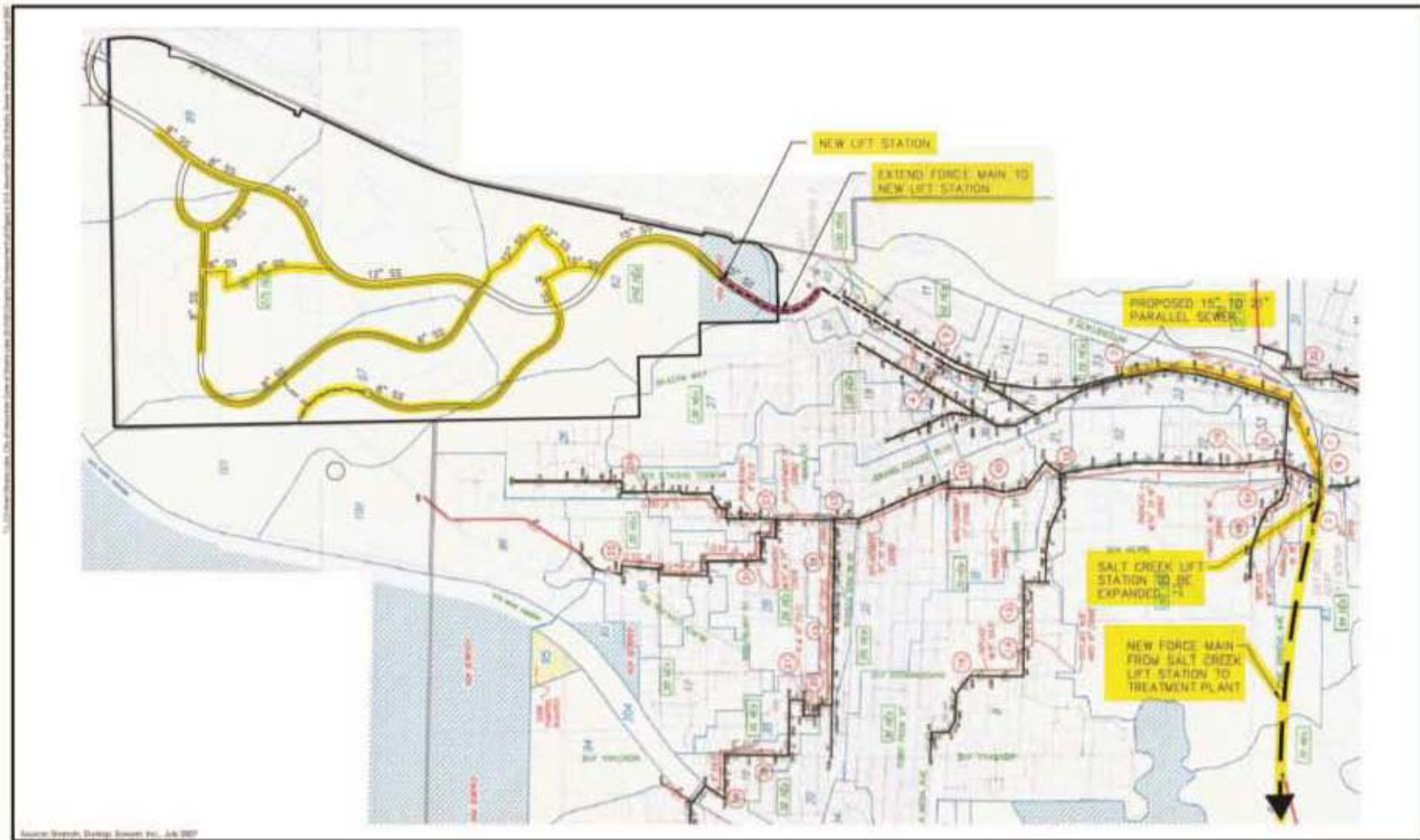


Figure 4.10-2
Mountain Gate at Shasta, Sewer Infrastructure
PMC

The Mountain Gate at Shasta Area Plan provides the following provisions for the project:

- The collection system would be expanded as required by the City's policies and standards to serve subdivisions of the Area Plan areas.
- To the extent feasible, reclaimed/recycled wastewater shall be used within the project boundaries.

Despite these provisions, according to the City of Shasta Lake Public Works Department, the city's wastewater system is not adequate to serve buildout conditions identified in the City's General Plan. In addition, due to limitations associated with the ability to dispose of reclaimed water, the wastewater system is not able to accommodate the entirety of the Mountain Gate at Shasta Area Plan.

The following mitigation measures shall also be implemented:

Mitigation Measures

MM 4.10.2.1a Subsequent development under the Area Plan shall be responsible for all sewer infrastructure necessary to serve the proposed development. All sewer infrastructure shall be designed and constructed in accordance with City of Shasta Lake design criteria.

Timing/Implementation: Prior to the issuance of building permits for each subsequent development project

Enforcement/Monitoring: City of Shasta Lake Development Services Department

MM 4.10.2.1b Project applicants shall be required to ensure wastewater service to future development within the Area Plan through the following means:

- Contribute a fair-share contribution toward the planning, engineering, and construction of all necessary off-site collection system improvements to serve the Area Plan. These improvements include, but may not be limited to:
 - Construction of a new lift station near the southerly boundary of the site, with a connection to the existing force main in Cascade Boulevard, north of Shasta Dam Boulevard.
 - Additional expansion of the Salt Creek Lift Station beyond that currently planned by the City to handle proposed development under the Area Plan.
 - Construction of a new force main from the Salt Creek Lift Station to the treatment plant, most likely following Pine Grove Boulevard from the Salt Creek Lift Station to the treatment plant.
 - Other improvements determined by the City Engineer to be required in order to serve future development.

4.10 UTILITIES AND SERVICE SYSTEMS

Timing/Implementation: Prior to recordation of subsequent tentative maps and/or prior to issuance of a building permit for any commercial development

Enforcement/Monitoring: City of Shasta Lake Development Services Department

According to the City of Shasta Lake Public Works Department, the City's wastewater system is not adequate to serve buildout conditions identified in the City's General Plan or the entirety of the Mountain Gate at Shasta Area Plan. The City's 2005 Wastewater System Master Plan has identified system deficiencies and improvements necessary to meet future populations in the city, and these improvements are projected to be constructed within 10–20 years. While implementation of mitigation measures **MM 4.10.2.1a** and **4.10.2.1b** would not directly result in the needed wastewater disposal capacity to serve the Area Plan at buildout, it would guarantee that development could not be constructed without first obtaining a verification of wastewater disposal capability prior to the issuance of building permits. Therefore, this impact is considered **less than significant**.

Exceed Wastewater Treatment Requirements (Standard of Significance 3)

Impact 4.10.2.2 Implementation of the proposed Mountain Gate at Shasta Area Plan would not result in the violation of wastewater treatment requirements. As a result, this impact would be **less than significant**.

As previously stated, the proposed Area Plan would produce a total of 0.42 MGD of wastewater at buildout. The City's 2005 Wastewater System Master Plan forecasts infrastructure and facility needs through ultimate buildout conditions identified in the City's General Plan. The master plan identified system deficiencies and improvements necessary to meet future populations in the city. The improvements are projected to be constructed within 10–20 years, though there are constraints and therefore the timing of improvements cannot be guaranteed. According to the City of Shasta Lake Public Works Department, the City's wastewater system is not currently adequate to serve buildout conditions identified in the City's General Plan or the entirety of the Mountain Gate at Shasta Area Plan until the Direct Discharge project is complete at which time the WWTP will be restored to its originally designed capacity of 1.3 MGD. If proposed development allowed under the Area Plan were allowed to commence without addressing this potential service deficit, wastewater treatment requirements could be exceeded.

The WWTP currently processes wastewater in accordance with standards set by the Central Valley RWQCB. The Central Valley RWQCB issued Permit No. 96-157 in 1996 to the City under the National Pollutant Discharge Elimination System (NPDES), setting the standards for the seasonal discharge of treated wastewater to Churn Creek when there is sufficient stream flow for adequate dilution (10:1 Churn Creek water to treated effluent) from November 15 through April 15, and the City follows this discharge requirement. As discussed under Section 4.10.2.1 above, the WWTP is currently covered under RWQCB Order R5-2008-0037 (National Pollutant Discharge Elimination System [NPDES] CA 0079511).

On December 20, 2013, the RWQCB issued a preliminary draft of the City's new NPDES permit and Time Schedule Order (TSO) for the WWTP. The TSO provides a five-year time schedule for completion of the WWTP improvements. The public hearing before the RWQCB for adoption of the permit and TSO was held on March 27, 2014.

The RWQCB required the City to address the removal of dilution credits and provide a plan for compliance with future permit limits. A Development Design Report, dated January 2013, was prepared for the City by Waterworks Engineers for improvements to the WWTP that would enable the City to meet projected new effluent limits reflecting zero dilution credits. This would allow direct discharge to Churn Creek year around and would restore the WWTP's original capacity to 1.3 MGD.

Lastly, implementation of mitigation measures **MM 4.10.2.1a** and **4.10.2.1b** would guarantee that development could not be constructed without first obtaining a verification of wastewater disposal capability prior to the issuance of building permits. Therefore, this impact is considered **less than significant**.

Mitigation Measures

None required.

4.10.2.4 CUMULATIVE SETTING, IMPACTS, AND MITIGATION MEASURES FOR WASTEWATER SERVICE

CUMULATIVE SETTING

The cumulative setting for wastewater is the City of Shasta Lake. As discussed previously, the City's ability to expand the capacity of the treatment plant is limited by the discharges allowed in Churn Creek and the unavailability of large reclaimed water users in the area. As stated in the Wastewater Master Plan, the WWTP was originally designed and constructed based on the concept that the plant would eventually be expanded to 2.3 MGD.

The project's ability to rely on the existing WWTP for disposal is uncertain. The long-term solution for disposal includes increasing the availability of land for the purposes of reclaimed water application.

CUMULATIVE IMPACTS AND MITIGATION MEASURES

Cumulative Wastewater Service

Impact 4.10.2.3 Implementation of the proposed project, in combination with other developments within the Shasta Lake water service area, would increase wastewater flows and the current demand for wastewater treatment services. This would be a **cumulatively considerable** impact.

Although implementation of the proposed Mountain Gate at Shasta Area Plan project, in combination with area and regional growth, would increase the overall demand for wastewater collection and treatment services, the necessary infrastructure to accommodate the proposed project and future planned development is being addressed and planned for in the General Plan and in the Wastewater System Master Plan. The Master Plan addresses future infrastructure needs based on buildout projections established in the General Plan. However, as discussed previously, the long-term solution for disposal includes using treated wastewater for irrigation purposes such as golf courses and roadside landscape. Unfortunately, these alternatives are solutions that are beyond the ability of this project to implement.

4.10 UTILITIES AND SERVICE SYSTEMS

Therefore, cumulative impacts on wastewater services are anticipated to be **potentially significant**.

Mitigation Measures

Implementation of mitigation measures **MM 4.10.2.1a** and **4.10.2.1b** would not directly result in the needed wastewater disposal capacity to serve the Mountain Gate at Shasta Area Plan at buildout. However, it would guarantee that development could not be constructed without first obtaining a verification of wastewater disposal capability prior to the issuance of building permits. Therefore, this impact is considered **less than cumulatively considerable**.

4.10.3.1 EXISTING SETTING FOR SOLID WASTE SERVICE

Solid waste generated in the project area will be disposed of at Shasta County's Richard W. Curry/West Central Sanitary Landfill located south of the community of Igo, 9.2 miles west of State Route 273. Through an agreement with Shasta County, the landfill receives all residential, commercial, and industrial solid waste generated within the city. The landfill currently has 19.5 years of remaining capacity and is currently estimated to be full by December 2032. This calculation assumes a 2.5 percent population growth in the service area, which has been less for at least the last five years. The County will begin the process of seeking permits to expand the landfill around 2017, 15 years prior to the estimated fill date.

Operation of the landfill is separated into five phases that have all been permitted. Expansion of the facility appears to be plausible at such time as increased capacity is warranted beyond the extent of existing permits. Although Shasta County owns the landfill, it has contracted with the City of Shasta Lake for the operation and management of the facility. The transfer station currently processes about 500 tons of garbage each day and was designed to operate at 750 tons per day to allow for growth.

Recycling efforts in the city currently focus on the collection of residential, curbside recyclable, and green waste, community education, and operation of a voluntary drop-off facility. The City has established a contract with Waste Management Inc. for source reduction and recycling, and the Buckeye Transfer Station facility is also available for residents.

4.10.3.2 REGULATORY FRAMEWORK FOR SOLID WASTE SERVICES

STATE OF CALIFORNIA

California Integrated Waste Management Act

To minimize the amount of solid waste that must be disposed of by transformation and land disposal, the California Legislature passed the California Integrated Waste Management Act of 1989 (AB 939), effective January 1990. According to AB 939, all cities and counties are required to divert 50 percent of all solid waste from landfill facilities. Solid waste plans are required to explain how each city's solid waste diversion effort will be integrated with the city plan. They must promote (in order of priority) source reduction, recycling and composting, and environmentally safe transformation and land disposal.

California Building Code (CALGreen)

Effective January 1, 2011, newly constructed buildings are required to recycle and/or salvage for reuse at least 50 percent of the construction materials generated during the construction phase of the project. Starting July 1, 2012, additions and alteration to buildings or structures also required to meet a minimum 50 percent construction and demolition waste diversion (CALGreen Sections 4.408 and 5.408). The City enforces the California Building Code (CBC), which includes these waste diversion provisions.

LOCAL

City of Shasta Lake General Plan

The City of Shasta Lake General Plan identifies specific policies regarding public utilities. **Table 4.10.3-1** analyzes the project's consistency with General Plan goals, objectives, and policies pertaining to solid waste in the city. While this Draft EIR analyzes the project's consistency with the General Plan pursuant to CEQA Section 15125(d), it is the City of Shasta Lake Planning Commission and/or City Council that will make the determination of the project's consistency with the identified General Plan policies.

TABLE 4.10.3-1
PROJECT CONSISTENCY WITH CITY OF SHASTA LAKE
GENERAL PLAN: SOLID WASTE

General Plan Objectives & Policies	Consistent with General Plan?	Analysis
Energy Objectives		
E-2 Conserve nonrenewable energy resources, specifically raw materials, transportation fuels, and land area, through the recovery and recycling of solid waste materials in a cost effective manner.	Yes	Policy 1 of the Area Plan: Solid waste service to the site will be provided by the current franchise solid waste service serving the City of Shasta Lake. Curbside service will be available to all residential areas and some nonresidential areas. Where curbside service is not provided, all solid waste collection enclosures shall meet applicable standards for refuse receptacles, recycling areas, and hauler access.
Public Facilities Policies		
PF-d The City shall take actions required to implement the Solid Waste Management Plan and Source Reduction and Recycling Element.	Yes	In 1997, a Source Reduction and Recycling Element (SSRE) was prepared for the City of Shasta Lake. The Mountain Gate at Shasta Area Plan would be required to comply with recycling facilities and requirements of the City of Shasta Lake SSRE.

4.10.3.3 IMPACTS AND MITIGATION MEASURES FOR SOLID WASTE SERVICE

STANDARDS OF SIGNIFICANCE

A solid waste impact is considered significant if implementation of the project would result in any of the following:

4.10 UTILITIES AND SERVICE SYSTEMS

- Be served by a landfill without sufficient permitted capacity to accommodate the project's solid waste disposal needs.
- Noncompliance with federal, state, and local statutes and regulations related to solid waste.

METHODOLOGY

Evaluation of potential solid waste impacts was based on review of the Shasta Lake General Plan and the City's collection, disposal, and recycling programs.

Impacts and Mitigation Measures

Served by a Landfill without Sufficient Permitted Capacity to Accommodate Solid Waste Service (Standard of Significance 1)

Impact 4.10.3.1 Buildout of the project would cause a substantial increase in demand for solid waste disposal services. Therefore, solid waste disposal impacts are considered **potentially significant**.

Solid waste in the city is disposed of at the Richard W. Curry/West Central Sanitary Landfill. The landfill currently has 19.5 years of remaining capacity and is currently estimated to be full by December 2032. This calculation assumes a 2.5 percent population growth in the service area, which has not been the case for at least the last five years. The County will begin the process of seeking permits to expand the landfill around 2017, which is approximately 15 years from the estimated fill date. The facility has one constructed but unused solid waste cell, and several future cells yet to be constructed for solid waste. All of the solid waste is in the current permitted landfill operation area. The landfill currently receives between 120,000 and 130,000 tons of solid waste a year, which is roughly 330 to 360 tons per day (Renz, 2013).

The proposed project would generate solid waste during construction activities. According to the EPA's (2003) "Construction and Demolition Amounts," the overall waste generation rate of residential construction is equal to 4.39 pounds of waste per square foot constructed. Similarly, the EPA estimates the overall waste generation rate of nonresidential construction to be 4.34 pounds of waste per square foot constructed. While housing types under the proposed project are expected to vary in each of the plan areas, for the purpose of estimating waste generation during construction activities for the project, proposed land use acreages are estimated to be built at the highest floor area ratios depicted in **Table 3.0-1** of Section 3.0, Project Description, which is 0.7. In other words, it is assumed that all residential development under the proposed project would be built on 70 percent of its lot in order to provide a conservative estimate of solid waste generation.

Using the EPA waste generation rates, the proposed project is estimated to generate approximately 20,369 tons of solid waste over the 15-25 years of construction [(12,980,880 square feet of residential lots x 0.7 = 9,086,616 square feet of residential building space x 4.39 = 39,890,244 pounds/19,945 tons) + (195,584 square feet of nonresidential building space x 4.34 = 848,834 pounds/424 tons) = 20,369 tons total. This would result in between 1,018 and 2,037 tons per year for a 10- or 20-year construction period, respectively. Application of the California Building Code requirements will divert a minimum of 50 percent of the construction waste from the landfill, which results in solid waste between 509 and 1,019 tons per year, or between 1.4 and 2.8 tons per day.

Using the California Department of Resources Recycling and Recovery (CalRecycle) (2013) Estimated Solid Waste Generation Rates for Residential Developments, the 1,604 proposed residential units under the project are estimated to generate approximately 19,617 pounds of solid waste on a daily basis ($1,604 \text{ units} \times 12.23 \text{ pounds of solid waste daily} = 19,616.9$). These 19,617 pounds of solid waste daily equate to 3,580 tons of solid waste annually. For the above calculations, all units were assumed to be single-family and generating at the rate of 12.23 pounds per day. Approximately 729 of the residential units have an allowed density greater than 10 units per acre and could be developed as multiple-family units. Multiple-family residential units generate solid waste at rates between one-third and one-half as much as single-family units. Using the higher rate for all of the units results in a conservative estimation of solid waste generation.

The proposed project would generate up to 195,584 square feet of nonresidential uses. Using ratios obtained from CalRecycle's (2012) Estimated Solid Waste Generation Rates for Commercial and Institutional Establishments, the proposed commercial land uses under the project are estimated to generate approximately 10.53 pounds of solid waste per employee each day. According to the Energy Information Administration (2001), commercial buildings contain an average of one employee per 766 square feet. Applying this ratio to the proposed project equates to 255 employees. These 255 employees would generate 10.53 pounds of solid waste each day, which equals 2,685 pounds of solid waste daily and 980,025 pounds (490 tons) of solid waste annually.

At buildout, the proposed project would be expected to generate 4,070 tons annually, or approximately 11.15 tons per day. Construction waste would be expected to add between 1.4 and 2.8 tons per day to the solid waste for the project. During construction, the project is not fully built or occupied so adding the construction waste to the calculations for solid waste generation at buildout overstates the generation factor for the project. However, if the generation amounts are combined to result in a very conservative estimate of solid waste generation, they would result in a total of between 12.55 and 13.95 tons per day.

The Environmental Impact Report for the Operation of the Richard W. Curry West Central Landfill (Shasta County 2003) projected that an average of 163,161 tons of solid waste per year would be delivered to the landfill between 2007 and 2017. The addition of between 12.55 and 13.95 tons per day at full buildout of the project represents an increase of between 3.8 and 4.2 percent to the 2013 current daily intake of between 330 and 360 tons. As there is adequate capacity in the landfill to meet the needs of the proposed project, this impact is considered **less than significant**.

Mitigation Measures

None required.

Noncompliance with Federal, State, and Local Statutes and Regulations Related to Solid Waste (Standard of Significance 2)

Impact 4.10.3.2 Buildout of the project would not increase the potential of noncompliance of AB 939 by the City by introducing additional waste into the solid waste stream. Therefore, potential noncompliance with federal, state, and/or local solid waste regulations is considered **less than significant**.

4.10 UTILITIES AND SERVICE SYSTEMS

As discussed above, AB 939 requires all cities and counties to divert 50 percent of all solid waste to landfills. In 1997, a Source Reduction and Recycling Element (SSRE) was prepared for the City of Shasta Lake to meet the requirements of AB 939 and the cleanup legislation. The SSRE is a plan that provides mechanisms to be implemented for source reduction, recycling, special wastes, composting, and education and public information programs in the City of Shasta Lake. Shasta County and the cities of Redding and Anderson have recycling facilities and programs that benefit the City of Shasta Lake.

The Mountain Gate at Shasta Area Plan and any future development would be required to comply with the requirements of the City of Shasta Lake SSRE. This requirement would reduce impacts to **less than significant**.

Mitigation Measures

None required.

4.10.3.4 CUMULATIVE SETTING, IMPACTS, AND MITIGATION MEASURES FOR SOLID WASTE SERVICE

CUMULATIVE SETTING

The cumulative setting for solid waste service includes the City of Shasta Lake's service area and solid waste transported and disposed at the Richard W. Curry/West Central Sanitary Landfill. Under existing state permits, the landfill has sufficient capacity to accommodate the disposal of solid waste at least to the year 2017. As previously discussed, AB 939 requires all cities and counties to divert 50 percent of solid waste from landfills as of January 1, 2000. In 1997, a Source Reduction and Recycling Element (SSRE) was prepared for the City of Shasta Lake to meet the requirements of AB 939 and the cleanup legislation. The SSRE is a plan that provides mechanisms to be implemented for source reduction, recycling, special wastes, composting, and education and public information programs in the City of Shasta Lake. Shasta County and the cities of Redding and Anderson have recycling facilities and programs that benefit the City of Shasta Lake.

CUMULATIVE IMPACTS AND MITIGATION MEASURES

Cumulative Solid Waste Disposal

Impact 4.10.3.3 The project would contribute to cumulative demands for solid waste disposal services. This impact is considered to be **less than cumulatively considerable**.

As stated under Impact 4.10.3.1, implementation of the project will not have an adverse effect on the City's ability to maintain acceptable levels of service or generate waste in excess of the Richard W. Curry/West Central Sanitary Landfill's permitted capacity. The landfill has adequate capacity, and the County will begin seeking new permits for expansion roughly 15 years before the estimated 2032 "full" date for the facility. The proposed project will be required to comply with construction and demolition waste diversion requirements contained in the California Building Code, which require at least 50 percent diversion. As the proposed project is consistent with development expectations in the city and county, impacts to solid waste will be **less than cumulatively considerable**.

Mitigation Measures

None required.

4.10.4.1 EXISTING SETTING FOR ELECTRICAL, NATURAL GAS, TELEPHONE, AND CABLE SERVICES

ELECTRICITY

The City of Shasta Lake is the primary supplier of electric service to citizens and businesses as a municipal electric utility. The system consists of 115 kilovolt (kV) transmission feeds from Western Area Power Administration (WAPA) facilities with local distribution via 6- to 12,000-volt distribution feeders. WAPA and other independent power producers supply power to the city. The City owns a 25-megawatt share of the California-Oregon Transmission Project (COTP).

Existing facilities include various 12 kV lines serving the proposed development. The distribution system consists of 2–20 MVA distribution substation transformers, where power is transformed from 115 kV transmission to 12 kV distribution voltage and connects to the service distribution transformers via the 12 kV distribution lines. The transmission system is designed as a highly reliable looped system (there are at least two sources for every distribution station), which ensures that an outage or failure of any one 115 kV line would not interrupt power to any 12 kV customer.

Approximately eleven new substations were proposed in the General Plan to serve new development.

NATURAL GAS

The Pacific Gas and Electric Company (PG&E) supplies natural gas within the city. Most of the developed areas of the city have natural gas service available, which include the areas known as Pine Grove, Project City, Central Valley, and Summit City. The principal transmission line extends north of Shasta Dam Boulevard along Lake Boulevard to the intersection with Red Bluff Lane. Gas service is available south of Shasta Dam Boulevard along Lake Boulevard to the Rancheria Pines Subdivision. There are currently no limitations on the amount of natural gas that PG&E can supply. As the demand for natural gas in the Shasta Lake area increases, PG&E will increase the pressures as necessary to provide additional services.

According to PG&E, natural gas distribution and service can be extended to and within the project site under applicable California Public Utilities Commission natural gas extension Rules 15 and 16.

TELEPHONE SERVICES

Currently, the Area Plan site has no telephone landline infrastructure or services. The project site is located within the AT&T Communications, for local service. AT&T has indicated that telephone service can be extended to serve the proposed development, provided sufficient lead-time and details are available to ensure that appropriate facilities and equipment are properly located to serve the project.

4.10 UTILITIES AND SERVICE SYSTEMS

CABLE SERVICES

TCI of California provides cable television within the urban area of Shasta Lake. Service is provided via overhead lines and is available to most areas of the city.

4.10.4.2 REGULATORY FRAMEWORK FOR ELECTRICITY, GAS, TELEPHONE, AND CABLE SERVICES

LOCAL

City of Shasta Lake General Plan

The City of Shasta Lake General Plan identifies specific policies regarding public utilities. **Table 4.10.4-1** analyzes the project's consistency with General Plan goals, objectives, and policies pertaining to public utilities. While this Draft EIR analyzes the project's consistency with the General Plan pursuant to CEQA Section 15125(d), it is the City of Shasta Lake Planning Commission and/or City Council that will make the determination of the project's consistency with the identified General Plan policies.

TABLE 4.10.4-1
PROJECT CONSISTENCY WITH CITY OF SHASTA LAKE
GENERAL PLAN: PUBLIC UTILITIES

General Plan Objectives & Policies	Consistent with General Plan?	Analysis
Energy Objective		
E-1 Utilize the City's renewable resource base to the extent feasible, including passive and active solar, wind, co-generation and biomass.	Yes	The proposed project will comply with the updated Title 24 standards, including the 2010 California Building Code (CBC), for building construction. These standards require new buildings to reduce water consumption by 20 percent, which results in less energy consumption for pumping water.
E-(2) Require consideration of passive solar energy techniques in subdivision design, including house orientation, street and lot layout, vegetation and protection of solar access.	Yes, with mitigation	Future development under the Area Plan would be required to adhere to mitigation measure MM 4.4.3b (see Section 4.4 of this DEIR), which requires the implementation of Shasta County Air Quality Management District (SCAQMD) Standard and Best Available Operational Mitigation Measures. SCAQMD Standard and Best Available Operational Mitigation Measures mandate the orientation of building structures that maximize the potential for natural cooling and passive solar design principles (this may include use of appropriate landscaping).
E-(3) Continue to require new buildings to meet state energy efficiency standards, and develop a design manual showing examples of energy conservation in subdivision planning, site layout, landscaping and building design.	Yes, with mitigation	See the analysis provided for Objective E-1 and Policy E-(2).

4.10.4.3 IMPACTS AND MITIGATION MEASURES FOR ELECTRICITY, GAS, TELEPHONE, AND CABLE SERVICES

STANDARDS OF SIGNIFICANCE

Electricity, natural gas, telephone, and cable service impacts are considered significant if implementation of the project would result in any of the following:

- Result in the need for new systems or supplies, or a substantial expansion or alteration to electricity, natural gas, or telephone facilities that results in a physical impact on the environment.

METHODOLOGY

Evaluation of potential impacts on electrical, natural gas, telephone, and cable services resulting from the proposed project was based on consultation with the service providers and review of City of Shasta Lake policies and relevant state standards. The analysis focuses on the environmental effects associated with the provision of these services to the project site.

IMPACTS AND MITIGATION MEASURES

Require or Result in the Construction of New Electric, Natural Gas, Telephone, and Cable Services and Infrastructure or Expansion of Existing Facilities (Standard of Significance 1)

Impact 4.10.4.1 Implementation of the proposed project would increase demand for electric, natural gas, telephone, and cable services and require the extension of existing infrastructure. This impact is considered **potentially significant**.

AT&T and PG&E have indicated that they have adequate supplies and facilities to accommodate the project demand for telecommunication and natural gas. All utilities would be placed within roadways to lessen environmental impacts; therefore, the placement of the required telecommunication and natural gas infrastructure would have **less than significant** environmental-related impacts.

All projects with five or more parcels and with lot sizes smaller than 3 acres are required to install new underground electric facilities. The largest parcels associated with the proposed Area Plan have lot sizes between 43 to 62 acres; therefore, all electrical facilities must be installed in underground trenches. All utilities would be placed within roadways to lessen environmental impacts. The City of Shasta Lake has indicated that it will require a new substation converting 115 kV to 12 kV to serve the project. This station will require the dedication of approximately 2 acres of land on the west side of the development. The City of Shasta Lake proposes to build a looped 115 kV line up the railroad right-of-way and into the station. All distribution lines at 12 kV would be undergrounded. The following mitigation is required to ensure the provision of adequate electrical supplies.

Mitigation Measures

MM 4.10.4.1 The developer shall dedicate a minimum of 2 acres of land on the west side of the development for the placement of an electrical substation by the City of Shasta Lake to serve the project.

4.10 UTILITIES AND SERVICE SYSTEMS

Timing/Implementation: *Identified prior to approval of subsequent tentative subdivision maps or other discretionary approvals.*

Enforcement/Monitoring: *City of Shasta Lake Electric Department*

Implementation of mitigation measure **MM 4.10.4.1** would ensure this impact is **less than significant**.

4.10.4.4 CUMULATIVE SETTING, IMPACTS, AND MITIGATION MEASURES FOR ELECTRICITY, GAS, TELEPHONE, AND CABLE SERVICES

CUMULATIVE SETTING

The proposed project, in conjunction with other development in the region, would cumulatively increase electric, natural gas, telephone, and cable service demand and related facilities.

CUMULATIVE IMPACTS AND MITIGATION MEASURES

Cumulative Electric, Natural Gas, Telephone, and Cable Service

Impact 4.10.4.2 Implementation of the proposed project, in addition to reasonably foreseeable developments in the area, would include the extension of existing infrastructure and require new facilities to accommodate the anticipated growth. This is considered a **less than cumulatively considerable** impact.

The proposed project and cumulative buildout of the region would contribute to the demand for electricity, natural gas, and telecommunications service in Northern California. Cumulative developments in the large service areas of the utility providers include a wide range of residential, commercial, and industrial uses. Given the large cumulative setting area, additional facilities and infrastructure would be needed to adequately provide services for the cumulative condition. The proposed project would require the construction of additional infrastructure to serve the site with electric service. The expansion of existing infrastructure and development of new infrastructure could result in cumulative physical impacts to the environment. However, such impacts have been evaluated throughout this Draft EIR. Where necessary and appropriate, mitigation measures have been imposed to reduce cumulative impacts to **less than cumulatively considerable** levels.

Mitigation Measures

None required.

REFERENCES

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4.11 PUBLIC SERVICES

This section evaluates the potential impact of the project on public services and utilities. Public services include fire protection, police protection, schools, and parks. Utilities include water distribution, wastewater collection, solid waste collection, and electricity, natural gas, telephone, and cable services and are discussed in Section 4.10, Utilities and Service Systems. The information in this section is based on a review of City documents and consultation with City staff and area service providers.

4.11.1 EXISTING SETTING FOR FIRE PROTECTION

FIRE PROTECTION SETTING

The Shasta Lake Fire Protection District (SLFPD) was formed on December 9, 1994. The district consists of the previous Central Valley Fire Protection District, the Summit City Fire Protection District, and small portions of the Buckeye Fire Protection District, Mountain Gate Community Services District, and Shasta County CSA #1. This reorganization took place to provide a single fire protection agency to provide fire protection, emergency medical service (EMS), and other services as needed to the City of Shasta Lake. The SLFPD is governed by its own five-member Board of Directors, which is elected from the public at large within the boundaries of the fire district. In addition to covering the entire City of Shasta Lake, the district also provides direct protection to an area of about 1 square mile to the east of the city along with automatic and mutual aid to adjacent jurisdictions. The district has a mutual aid agreement with the Shasta County Fire Department.

The Shasta Lake Fire Protection District currently works out of three fire stations:

- **Station One, 4126 Ashby Court:** This station is staffed 24 hours a day by paid staff. There are five people on duty between 8 a.m. and 5 p.m. Monday through Friday. Two paid personnel are on duty the remainder of the time. During fire season, an additional three seasonal firefighters are hired and support the staffing of the station. Station One has two advanced life support rescue units, Rescue 42 and Patrol 42; one of these units is also a brush patrol for wildland fires. The station has one Type 1 engine, Engine 42, and two Type 2 engines, Engine 242 and Engine 642. Engine 642 is equipped for advanced life support calls. Station One also houses a breathing air trailer.
- **Station Two, 5270 Akrich:** There are currently no paid personnel at this station.
- **Station Three, 13791 Lake Boulevard:** There are currently no paid personnel at this station. Volunteers respond to this station as needed. The station currently houses one Type 2 engine that is equipped for advanced life support calls. Station Three also houses one quad trailer and two quad runners used for rescues and fires.

The SLFPD currently employs one fire chief, two battalion chiefs, three captains, three engineers, one administrative assistant, and 15 volunteer firefighters. During fire season, an additional three firefighters are added to the roster. The fire chief is responsible for all operations in the fire district. With a current population of 10,325, the ratio is currently 2.6 firefighters per 1,000 residents. The SLFPD has three volunteer fire halls; one is located 1.5 miles from the proposed south entrance of the Mountain Gate at Shasta Area Plan. The SLFPD's average response time for all emergency response within its service area is 5 minutes.

The Mountain Gate Volunteer Fire Station is located approximately 250 feet northeast from the proposed project site at Wonderland Boulevard. This station currently has only one salaried

4.11 PUBLIC SERVICES

employee, the captain, with the remaining force volunteer. Due to the proximity along Mountain Gate Road, within 250 feet of the project site, it is anticipated that this station would respond to service calls within the project site pursuant to agreements with the SLFPD.

HOSPITAL

Located in Redding are two major medical centers that offer a comprehensive range of inpatient and outpatient medical services. Shasta Regional Medical Center has 165 beds and specializes in cardiac care and laser surgery. It has a 24-hour air helicopter ambulance program. Mercy Medical Center has 264 beds with programs specializing in cancer and cardiac disease treatment. In addition to helicopter ambulance service, it also has two airplanes. Both facilities serve all of far Northern California and can extend service to Oregon, Nevada, and the Pacific.

In addition to the major medical centers, other specialty facilities exist in Redding, which are available to city residents. Vibra Hospital of Northern California is an 88-bed medical facility specializing in long term acute care, transitional care and outpatient rehabilitation. Patients Hospital is an acute care facility that specializes in surgery, pain management and other procedures. The Veterans Outpatient Clinic, the only such facility north of Sacramento, provides care and treatment for acute medical and chronic problems, medical examinations, and a full range of diagnostic services.

4.11.2 REGULATORY FRAMEWORK FOR FIRE PROTECTION

STATE

California Fire Code

The 2013 California Fire Code (Title 24, Part 9, of the California Code of Regulations) establishes regulations to safeguard against hazards of fire, explosion, or dangerous conditions in new and existing buildings, structures, and premises. The Fire Code also establishes requirements intended to provide safety and assistance to firefighters and emergency responders during emergency operations. Fire Code provisions Code apply to the construction, alteration, movement, enlargement, replacement, repair, equipment, use and occupancy, location, maintenance, removal, and demolition of every building or structure in California. The Fire Code includes regulations regarding fire-resistance-rated construction, fire protection systems such as alarm and sprinkler systems, fire services features such as fire apparatus access roads, means of egress, fire safety during construction and demolition, and wildland-urban interface areas.

California Health and Safety Code

Additional state fire regulations are set forth in Section 13000 et seq. of the California Health and Safety Code. They include regulations for building standards as set forth in the California Building Standards Code, fire protection and notification systems, fire protection devices such as extinguishers, smoke alarms, high-rise buildings, childcare facility standards, and fire suppression training.

LOCAL

City of Shasta Lake General Plan

The City of Shasta Lake General Plan provides objectives and policies related to fire protection services. **Table 4.11.1-1** analyzes the project's consistency with these relevant policies. While this Draft EIR analyzes the project's consistency with the General Plan pursuant to California Environmental Quality Act (CEQA) Section 15125(d), it is the City of Shasta Lake Planning Commission and/or City Council that will make the determination of the project's consistency with the identified General Plan policies.

TABLE 4.11.1-1
PROJECT CONSISTENCY WITH CITY OF SHASTA LAKE
GENERAL PLAN: FIRE PROTECTION

General Plan Objectives & Policies	Consistent with General Plan?	Analysis
Fire Safety & Law Enforcement Objectives		
FS-1 Protect development from wildland and non-wildland fires by requiring development to incorporate design measures responsive to the risk from this hazard.	Yes	Area Plan Policy Section 3.9, Roads, Policy 1 states that all dead-end roads are required to be constructed with a turnaround at the terminus approved by the City of Shasta Lake and the Shasta Lake Fire Protection District. This policy also acknowledges that the roadway standard may need to be widened in the vicinity of each fire hydrant or at intersections to allow for efficient traffic flow. Area Plan Policy Section 3.11, Fire Protection, Policy 1 states that in order to provide for fire safety access and evacuation, a paved fire access roadway shall be constructed from Shasta Dam Boulevard to Wonderland Boulevard/Mountain Gate Road to the satisfaction of the City Engineer and the Shasta Lake Fire Protection District. Furthermore, the California Fire Code includes regulations regarding fire-resistance-rated construction, fire protection systems such as alarm and sprinkler systems, fire services features such as fire apparatus access roads, means of egress, fire safety during construction and demolition, and wildland-urban interface areas.
Fire Safety & Law Enforcement Policies		
FS-b All land divisions and development shall be required to conform to Shasta Lake Fire Protection District Fire Safety Standards.	Yes	Area Plan Policy Section 3.11, Fire Protection, Policy 1 states that in order to provide for fire safety access and evacuation, a paved fire access roadway shall be constructed from Shasta Dam Boulevard to Wonderland Boulevard/Mountain Gate Road to the satisfaction of the City Engineer and the Shasta Lake Fire Protection District. In addition, all future development under the proposed Area Plan would be required to adhere to all Shasta Lake Fire Protection District fire safety standards.
FS-c Known fire hazard information should be reported as part of every general plan amendment, zone change, use permit,	Yes	The proposed project site is located in an area identified by the SLFPD as a hazard severity zone.

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General Plan Objectives & Policies	Consistent with General Plan?	Analysis
variance, building site approval, and all other land development applications to environmental assessment.		
FS-e Development in areas requiring additional levels of police and fire services shall participate in offsetting costs for the additional services.	Yes	The area plan and development agreement will ensure that the project contributes its fair share toward the cost of providing services.
Fire Safety & Law Enforcement Implementation Measures		
FS-(1) Maintain an average response time of four minutes or less for all proposed urban development.	Yes	The proposed project is within 250 feet of the existing Mountain Gate Volunteer Fire Station. In addition, Area Plan Policy Section 3.11, Fire Protection, Policy 2 requires that prior to occupancy of the 500th residential unit, 2 acres and a three-bay fire station with offices and sleeping quarters shall be located and constructed in Area H or Area I to Shasta Lake Fire Protection District standards. Upon completion, the station will be dedicated to the Shasta Lake Fire Protection District. The cost of construction of the fire station and land dedication shall be offset by fire facility impact fees.
FS-(2) Maintain mutual aid agreements with other agencies in Shasta County.	Yes	The City maintains mutual aid agreements with the Shasta County Sheriff's Department and the California Department of Forestry and Fire Protection (Cal Fire).
FS-(3) Evaluate the possibility of requiring automatic fire sprinklers for all new development that is not within 1.5 miles of an existing or planned fire station.	Yes	The California Building Code and California Residential Code require that all new dwelling units constructed after January 1, 2011, install a residential fire sprinkler system. The California Building Code also includes fire sprinkler requirements for various public assembly uses. Furthermore, the Area Plan includes the provision of a new fire station prior to construction of the 500 th lot or construction of 50 percent of the commercial uses, or a combination of both as determined during review of subsequent tentative subdivision maps or other discretionary permits for the project.
FS-(5) Develop standards to protect structures in wildland fire areas for inclusion in the Best Practices Manual or similar implementing program. These standards will include, for example, use of fire-resistant building and roofing materials, installation of fire-resistant landscaping, maximum road gradients and clearance of vegetation proximate to structures.	Yes	Area Plan Policy Section 3.11, Fire Protection, Policy 1 states that in order to provide for fire safety access and evacuation, a paved fire access roadway shall be constructed from Shasta Dam Boulevard to Wonderland Boulevard/Mountain Gate Road to the satisfaction of the City Engineer and the Shasta Lake Fire Protection District. In addition, all future development under the proposed Area Plan would be required to adhere to all Shasta Lake Fire Protection District fire safety standards.

Shasta Lake Fire Protection District, Ordinance 97-1

The SLFPD has fire protection requirements and standards for new development projects, including standards for hydrant spacing, fire flow, access, and roadway requirements, as well as

requiring adequate roadway widths. Ordinance 97-1 was adopted on January 13, 1997, for the purpose of prescribing regulations governing conditions hazardous to life and property from fire, hazardous materials, or explosion, providing for the issuance of permits for hazardous uses or operations, and establishing a bureau of fire prevention and providing officers and defining their powers and duties.

The district's fire marshal reviews all projects wherein an entitlement is granted by the City (maps, use permits, etc.) prior to approval of any construction for compliance with state and local requirements.

4.11.3 IMPACTS AND MITIGATION MEASURES FOR FIRE PROTECTION

STANDARDS OF SIGNIFICANCE

Based on Appendix G of the CEQA Guidelines, the City concludes that a project may have significant impacts on public services if it does any of the following:

- 1) Result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times, or other performance objectives for fire protection.
- 2) 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

Evaluation of potential fire and emergency medical service impacts of the proposed project was based on consultation with the SLFPD fire chief, as well as a review of the City of Shasta Lake's General Plan.

IMPACTS AND MITIGATION MEASURES

Provision of New Fire Protection Facilities in Order to Maintain Service (Standard of Significance 1)

Impact 4.11.1 Buildout of the proposed project would increase the demand for additional fire protection services and emergency medical services. This will result in a **significant** impact.

Under a buildout scenario and assuming that the project would have a population of 2.58 persons per dwelling unit (based on information from the California Department of Finance), the project would result in a population increase of 4,138 persons (see Section 4.2, Population/Housing/Employment). This population would increase the number of calls for fire and emergency medical services.

General Plan Policy FS-e states, "Development in areas requiring additional levels of police and fire services shall participate in offsetting costs for the additional services." Fire protection and emergency medical response within Shasta Lake is provided through the SLFPD. The district has fire protection requirements and standards for new development projects, including standards

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for hydrant spacing, fire flow, access, and roadway requirements, as well as requirements for adequate roadway widths (Ordinance 97-1, adopted January 1997). The district's fire marshal reviews all projects wherein an entitlement is granted by the City (maps, use permits, etc.) prior to any construction for compliance with state and local requirements. Existing services would not be adequate to serve the proposed project.

An emergency access road is proposed for the Mountain Gate at Shasta Area Plan off Black Canyon Drive (at the northwest end of the site). The proposed project will also require the construction of a water storage tank for additional water supplies for fire suppression.

The closest fire station to the project site is the Mountain Gate Volunteer Fire Department, located approximately 250 feet northeast from the project site at Wonderland Boulevard. The fire department currently has only one salaried employee, the captain, with the remaining force volunteer. The captain has indicated that crews at this station would be available to respond to the project site under a current agreement with the Shasta Lake Fire Protection District.

The Fire District's Impact Fee Study (March 30, 2006) acknowledges:

The District believes a new fire station may be required for the Peri Property in the northeast portion of the District, once residential and commercial development begin to build-out the property. Overall, the District has determined that a new engine company is needed for each increment of 2,500 population... Rather than include the cost of a station in the impact fee at this time, the space needs for each engine company increment are shown in Table 6. The District will work with the developer of the Peri property, and the City of Shasta Lake, during preparation of the Specific Plan and Environmental impact Report, the determine the appropriate station needs at this location.

Table 6 of the fee study shows costs for a 3,000-square-foot fire station structure plus equipment as \$1,279,482 (in 2006 dollars). Fees for the structure alone are shown at \$750,000.

Based on discussions with Fire Chief Adrian Rogers, the District requires the dedication of 2 acres within the project boundaries for a future fire station. This is shown in the Area Plan as being within Area H or Area I but could ultimately be constructed in another area of the project.

The fire chief indicated current impact fees, which are paid at the time of issuance of a building permit, are \$1,046 per single-family dwelling unit and \$859.94 per multi-family dwelling unit. The impact fee for small commercial is based on a single-family equivalent (SFE) of one SFE per 3,000 square feet. The fee for large commercial is \$0.38 per square foot. The fire chief confirmed impact fees to be paid in conjunction with development within the project boundaries are adequate to fund construction of a future station. The district reviews its impact fee schedule annually and has the ability to adjust fees and/or incorporate an inflation escalator into the fee schedule. Construction of the new fire station will be the responsibility of the SLFPD.

Dedication of 2 acres and payment of impact fees will allow the construction of a fire station, which ensures that impacts to fire protection services would be **less than significant**. The environmental effect of constructing a fire station within the Area Plan has been programmatically evaluated in the technical analyses of this DEIR as part of overall development of the Area Plan. In terms of potential operational impacts, the provision of this additional facility is proposed separately from the proposed General Plan and would be required to undergo project-specific environmental review at such time as an application for the project is submitted.

Mitigation Measures

MM 4.11.1 Prior to occupancy of the 500th residential unit, applicant shall dedicate two (2) acres located within either Area H or Area I to the Shasta Lake Fire Protection District. The cost of construction of the fire station shall be borne by the Shasta Lake Fire Protection District (SLFPD).

Timing/Implementation: Prior to issuance of a building permit for the 500th dwelling unit or construction of 50 percent of the commercial development, or a combination of both as determined by the SLFPD during review of subsequent tentative subdivision map or other discretionary permits.

Enforcement/Monitoring: City of Shasta Lake Development Services Department; Shasta Lake Fire Protection District

With implementation of mitigation measure **MM 4.11.1.1**, impacts to fire services would be reduced to a level that is **less than significant**.

Exposure of People or Structures to Wildfire Hazards (Standard of Significance 2)

Impact 4.11.1.2 Buildout of the proposed project would locate homes and structures in an area identified by the SLFPD as a wildfire hazard severity zone, which would expose residents to wildland fire hazards. This is considered a **less than significant** impact.

The proposed project site is located in an area identified by the SLFPD as a wildfire hazard severity zone. The proposed project would result in increased population on the project site and thus would increase exposure of people and structures to significant risk of loss, injury, or death involving wildland fires originating off-site and spreading to the project site.

However, the proposed project would be required to comply with the 2013 California Building Standards Code (CBSC) (Title 24 of the California Code of Regulations) and Defensible Space Requirements (Public Resources Code Sections 4290 and 4291), which establish minimum standards for materials and material assemblies to provide a reasonable level of exterior wildfire exposure protection for buildings in wildland-urban interface areas, the use of ignition-resistant materials and design to resist the intrusion of flame or burning embers projected by a vegetation fire, and the provision of defensible space around all structures. For example, CBSC Part 2, Chapter 7a (Wildland-Urban Interface Fire Area Building Standards) requires exterior walls to be constructed of approved noncombustible or ignition-resistant material, with heavy timber or log wall construction providing protection from the intrusion of flames and embers.

In addition, where the roof profile allows a space between the roof covering and roof decking, the spaces are required to be constructed to prevent the intrusion of flames and embers or be fire-stopped with approved materials. CBSC Part 9, Chapter 47 includes regulations regarding fire-resistance-rated construction, fire protection systems such as alarm and sprinkler systems, fire services features such as fire apparatus access roads, means of egress, and fire safety during construction and demolition. Public Resources Code Section 4291 generally requires that a defensible space clearance of 100 feet be maintained from each side and from the front and rear of structures.

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In addition, PRC Section 4291 requires the owner of any new development to obtain a certification from the local building official that the dwelling or structure, as proposed to be built, complies with all applicable state and local building standards and that upon completion of construction the owner obtain from the local building official a copy of the final inspection report demonstrating that the dwelling or structure was constructed in compliance with all applicable state and local building standards. The proposed project would be required to comply with the above and all other standards of the California Building Standards Code.

The California Building Code and California Residential Code require that all new dwelling units constructed after January 1, 2011, install a residential fire sprinkler system. The California Building Code also includes fire sprinkler requirements for various public assembly uses.

The City's Water Efficient Landscape Ordinance Municipal Code Section 15.10.050) requires a landscape design plan for projects in fire-prone areas to address fire safety and prevention and prohibits fire-prone plant materials and highly flammable mulches. In addition Municipal Code Section 15.08.250, for development in areas defined as hillside areas, a finding must be made that the location and design of the proposed development will protect the safety of current and future residents and will not create a significant threat to life and property due to slope instability, fire, flood, mud flow, erosion or other hazards.

In addition, Area Plan Policy Section 3.9, Roads, Policy 1 states that all dead-end roads are required to be constructed with a turnaround at the terminus approved by the City of Shasta Lake and the Shasta Lake Fire Protection District. This policy also acknowledges that the roadway standard may need to be widened in the vicinity of each fire hydrant or at intersections to allow for efficient traffic flow. Area Plan Policy Section 3.11, Fire Protection, Policy 1 states that in order to provide for fire safety access and evacuation, a paved fire access roadway shall be constructed from Shasta Dam Boulevard to Wonderland Boulevard/Mountain Gate Road to the satisfaction of the City Engineer and the Shasta Lake Fire Protection District.

Compliance with the California Building Standards Code, the defensible space requirements included in the Public Resources Code, and all applicable Area Plan policy requirements would ensure that the proposed project would provide the necessary wildfire protection standards to minimize the safety effects of being located in a wildfire hazard severity zone.

Implementation of existing regulations that address project impacts unique to evacuating the site population would reduce this project impact to **less than significant** and in a manner consistent with state regulations on managing exposure to wildland fire hazards.

Mitigation Measures

None required.

4.11.1.4 CUMULATIVE SETTING, IMPACTS, AND MITIGATION MEASURES FOR FIRE PROTECTION

CUMULATIVE SETTING

The proposed project, in conjunction with future development in the area, would result in an increased need for fire protection services. The proposed Mountain Gate at Shasta Area Plan would increase the population in the area by an estimated 4,138 persons. The land has been designated for development since adoption of the City's General Plan. The City has anticipated

that the proposed project site will be developed with a mix of uses and implemented with an Area Plan.

Fire protection within the City of Shasta Lake is provided through the Shasta Lake Fire Protection District. The SLFPD has three volunteer fire halls; one is located 1.5 miles from the proposed south entrance of the Mountain Gate at Shasta Area Plan. The SLFPD's average response time for all emergency response within its service area is 5 minutes. Because of its proximity along Mountain Gate Road, within 250 feet of the project site, it is anticipated that the Mountain Gate Volunteer Fire Station also would respond service calls within the project through an agreement with the Fire District.

CUMULATIVE IMPACTS AND MITIGATION MEASURES

Cumulative Fire Services

Impact 4.11.1.3 The proposed project, in addition to foreseeable development, would increase the population within the SLFPD service area and require additional fire and emergency medical services. This would be a **less than cumulatively considerable** impact.

The Shasta Lake Fire Protection District has indicated that existing services are not adequate to serve the project or future development. The Mountain Gate Volunteer Fire Department, located in close proximity to the project, has also indicated that its existing services are not adequate. Implementation of **MM 4.11.1** and Area Plan Fire Protection Policy 2, based on recommendations of the Shasta Lake Fire Protection District and the Mountain Gate Volunteer Fire Department, would mitigate the impacts to fire protection services to a **less than significant** impact.

Mitigation Measures

None required.

4.11.2.1 EXISTING SETTING FOR POLICE PROTECTION

POLICE PROTECTION SETTING

Law enforcement services are contracted through the Shasta County Sheriff's Department. The contract provides for ten sworn officers (deputies), one captain, two part-time cadets and one Sheriff Service Officer. In emergencies, additional personnel are available through the full resources of the Sheriff's Department and mutual aid agreements with other agencies. The Sheriff's Department is also responsible for enforcing all traffic regulations in the city.

The Sheriff's Department substation is located at 4488 Red Bluff Street and provides 24-hour service for the City of Shasta Lake. However, this office is not staffed at all times. The contract requires that at least one officer be on duty within the city limits at all times. Calls for police service are dispatched through SHASCOM, the 911 emergency dispatch center for the City of Redding, City of Anderson, and Shasta County, in addition to the City of Shasta Lake.

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4.11.2.2 REGULATORY FRAMEWORK FOR POLICE PROTECTION

LOCAL

City of Shasta Lake General Plan

The City of Shasta Lake General Plan provides goals and policies related to public services. **Table 4.11.2-1** analyzes the project's consistency with these relevant policies. While this DEIR analyzes the project's consistency with the General Plan pursuant to CEQA Section 15125(d), it is the City of Shasta Lake Planning Commission and/or City Council that will make the determination of the project's consistency with the identified General Plan policies.

TABLE 4.11.2-1
PROJECT CONSISTENCY WITH CITY OF SHASTA LAKE
GENERAL PLAN: POLICE PROTECTION

General Plan Objectives & Policies	Consistent with General Plan?	Analysis
Fire Safety & Law Enforcement Objectives		
FS-2 Protect life and property from crime by encouraging the incorporation of defensible space design techniques in the physical design of new development.	Yes	Area Plan Policy Section 3.9, Roads, Policy 4 states that streetlights will be provided along all Area Plan streets. Street lighting will also be provided along public walkways providing sufficient illumination for pedestrian safety.
Fire Safety & Law Enforcement Policies		
FS-d New development shall be encouraged to incorporate site planning and appropriate structure design features designed to deter crime.	Yes	Area Plan Policy Section 3.9, Roads, Policy 4 states that streetlights will be provided along all Area Plan streets. Street lighting will also be provided along public walkways providing sufficient illumination for pedestrian safety.
FS-e Development in areas requiring additional levels of police and fire services shall participate in offsetting costs for the additional services.	Yes	Area Plan Policy Section 3.11, Police Protection, Policy 1 requires that all future development within the Area Plan participate in funding mechanisms designed to keep the ratio of public safety officers to population, or population equivalent, at a ratio of 1.5 officers per 1,000 residents.
Fire Safety & Law Enforcement Implementation Measures		
FS-(1) Maintain an average response time of four minutes or less for all proposed urban development.	Yes	Area Plan Policy Section 3.11, Police Protection, Policy 1 states that all development shall participate in funding mechanisms designed to keep the ratio of public safety officers to population, or population equivalent, at a ratio of 1.5 officers per 1,000 residents. The maintenance of this ratio would ensure the response time of 4 minutes is achievable.
FS-(6) Provide rapid and timely response for all law enforcement emergencies and maintain the capability to have minimum average response times.	Yes	See analysis for Implementation Measure FS-(1).

4.11.2.3 IMPACTS AND MITIGATION MEASURES FOR POLICE PROTECTION**STANDARDS OF SIGNIFICANCE**

The impact analysis provided below is based on the following State CEQA Guidelines Appendix G thresholds of significance, which state that a project would have a significant impact if it would:

- 1) Result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times, or other performance objectives for police protection.

METHODOLOGY

Evaluation of potential police protection service impacts of the proposed project was based on consultation with the Shasta County Sheriff's Department, as well as a review of the City of Shasta Lake's General Plan.

IMPACTS AND MITIGATION MEASURES**Provision of New Police Protection Facilities in Order to Maintain Service (Standard of Significance 1)**

Impact 4.11.2.1 Buildout of the proposed project would require additional police protection services. This will result in a **potentially significant** impact.

General Plan Policy FS-e states, "Development in areas requiring additional levels of police and fire services shall participate in offsetting costs for the additional services." According to Sheriff's Captain Forrest Bartell with the Shasta County Sheriff's Office, law enforcement services are currently stretched thin in the City of Shasta Lake. The increase of population from this project, and other major residential projects in the area, will cause additional calls for service to the department, causing slower response times to emergency calls. Captain Bartell recommends that the City seriously consider increasing law enforcement staffing levels in the City. Since development of a subdivision and addition of residents to the area results in the need for continuing services, the City recommends a long-term solution to funding law enforcement services.

Although the General Plan recognizes that the City should establish level of service standards for law enforcement services, this has not yet been completed. For comparison, the City of Redding General Plan establishes a standard of 1.36 officers per 1,000 residents, and the national average is 2.2 officers per 1,000 residents. In addition to population, however, level of service ratios are also based on crime rates, expected response times, workload analysis, and specific community characteristics and priorities. The proposed Area Plan Policy Section 3.11, Police Protection, Policy 1 proposes that all development under the Area Plan participate in funding mechanisms designed to keep the ratio of public safety officers to population, or population equivalent, at a ratio of 1.5 officers per 1,000 residents.

There are currently ten deputies assigned to the City of Shasta Lake. With a current city population of 10,100, the ratio is currently one officer per 1,010 residents, below local and

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national averages. The addition of population in the area as a result of the proposed Area Plan would be considered a **potentially significant** impact on law enforcement services requiring mitigation.

Mitigation Measures

MM 4.11.2.1 In coordination with the City of Shasta Lake, all future development projects within the Area Plan shall participate in funding mechanisms designed to maintain the ratio of public safety officers to population, or population equivalent, at 1.5 officers per 1,000 residents.

Timing/Implementation: *Verification prior to approval of subsequent tentative subdivision maps or other discretionary permits.*

Enforcement/Monitoring: *City of Shasta Lake Development Services Department*

With implementation of mitigation measure **MM 4.11.2.1**, impacts to police services would be reduced to a level that is **less than significant**.

4.11.2.4 CUMULATIVE SETTING, IMPACTS, AND MITIGATION MEASURES FOR POLICE PROTECTION

CUMULATIVE SETTING

The proposed project, in conjunction with future development in the area, would result in an increased need for police protection services. The proposed Mountain Gate at Shasta Area Plan would increase the population in the area by an estimated 4,138 persons. The land has been designated for development since adoption of the City's General Plan. Police protection is contracted through the Shasta County Sheriff's Department. In emergencies, additional personnel are available through the full resources of the Sheriff's Department and mutual aid agreements with other agencies.

CUMULATIVE IMPACTS AND MITIGATION MEASURES

Cumulative Law Enforcement

Impact 4.11.2.2 The proposed project, in addition to foreseeable development, would increase the population in the City of Shasta Lake and require additional law enforcement services. This would be a **potentially cumulatively considerable** impact.

Captain Forrest Bartell with the Shasta County Sheriff's Office has indicated that the increase of population from this project, and other major residential projects in the area, will cause slower response times to emergency calls.

Although the General Plan recognizes that the City should establish level of service standards for law enforcement services, this has not yet been completed. For comparison, the City of Redding General Plan establishes a standard of 1.36 officers per 1,000 residents, and the national average is 2.2 officers per 1,000 residents. The proposed Area Plan Policy Section 3.11Police

Protection, Policy 1 proposes that all development under the Area Plan participate in funding mechanisms designed to keep the ratio of public safety officers to population, or population equivalent, at a ratio of 1.5 officers per 1,000 residents. Implementation of mitigation measure **MM 4.11.2.1** would ensure this Area Plan policy is instigated, and impacts to police services would be reduced to a level that is **less than cumulatively considerable**.

Mitigation Measures

None required.

4.11.3.1 EXISTING SETTING FOR PUBLIC SCHOOLS

PUBLIC SCHOOLS SETTING

Increased enrollment resulting from new housing units is mitigated as provided by state law at the time of issuance of building permits by payment of a School Facility (Developer) Impact Fee. The fee is paid at issuance of a building permit and is paid directly to the Shasta County Office of Education to provide compensation for funding school facility expansion.

The Gateway Unified School District (GUSD) provides educational opportunities for students from preschool through the 12th grade. The district office is located at 4411 Mountain Lakes Boulevard in Redding. According to the California Department of Education, *School Enrollment for the 2012-13 School Year*, total enrollment in the GUSD was 3,959 students. This included 1,372 students enrolled in Gateway Charter Schools that serve students throughout Shasta County (Academy of Personalized Learning, K-12; North Woods Discovery School, K-8; Redding School of the Arts II, K-8; and Rocky Point Charter School, K-8). Enrollment for all schools located within the city limits was 1,917.

**TABLE 4.11.3-1
GATEWAY UNIFIED SCHOOL DISTRICT
SCHOOL SUMMARIES**

School	Grades	Enrollment
Central Valley High 4066 La Mesa, Shasta Lake, CA	9–12	780
Buckeye School of Arts 3407 Hiatt Drive, Redding, CA	K–8	608
Shasta Lake School 4620 Vallecito St., Shasta Lake, CA	K–8	753
Grand Oaks Elementary School 5309 Grand Ave., Shasta Lake, CA	K–5	291
Mountain Lakes High School 17752 Shasta Dam Blvd., Shasta Lake, CA	10–12	93
Gateway Community Day School	8–9	7
Gateway Educational Options	K-12	55
Gateway Charter Schools	K-12	1,372

Source: California Department of Education, 2012-13 School Enrollment; Gateway Unified School District website

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FUNDING

State Funding

The Kindergarten-University Public Education Facilities Bond Act of 1998 (Prop 1A)

Proposition 1A, the Kindergarten-University Public Education Facilities Bond Act of 1998, was approved by the voters in November 1998. This proposition provided \$6.7 billion in general obligation bonds for K–12 public school facilities and provided the first funding for the new School Facility Program. The School Facility Program provides state funding assistance for two major types of facilities construction projects: new construction and modernization. At the time of the passage of this proposition, it was the largest school bond in the history of the state (State of California 2008).

The Kindergarten-University Public Education Facilities Bond Act of 2002 (Prop 47)

Proposition 47, the Kindergarten-University Public Education Facilities Bond Act of 2002, was the first part of a \$25.3 billion statewide bond package. Proposition 47 was a \$13.05 billion bond measure approved by voters in November 2002 that provided \$11.4 billion in general obligation bonds for K–12 facilities through the School Facility Program, as well as funding for new programs, charter school facilities, critically overcrowded schools, joint-use projects, and small high schools (State of California 2008). Funds are targeted to areas of greatest need and must be spent according to strict accountability measures. The remaining \$1.65 billion was allocated to build, repair, and upgrade community college, California State University, and University of California facilities in order to provide adequate higher education facilities to accommodate growing student enrollment.

The Kindergarten-University Public Education Facilities Bond Act of 2004 (Prop 55)

On March 2, 2004, voters in California passed Proposition 55, the second part of a \$25.3 billion statewide bond package. Proposition 55 authorized \$12.3 billion to help fund public school facility needs. The passage of Proposition 55 provided an additional \$10.0 billion in general obligation bonds for the construction and renovation of K–12 school facilities. These funds are made available through the School Facility Program and continue to assist school districts with overcrowding, accommodating future enrollment growth, and repairing and modernizing older facilities (State of California 2008). The remaining \$2.3 billion is reserved for community college, California State University, and University of California facilities.

The Kindergarten-University Public Education Facilities Bond Act of 2006 (Prop 1D)

Proposition 1D, officially the Kindergarten-University Public Education Facilities Bond Act of 2006, was approved by the voters in November of 2006 and provided \$10.416 billion in general obligation bonds for educational facilities, of which \$7.329 billion was earmarked for K–12 projects (State of California 2008).

4.11.3.2 REGULATORY FRAMEWORK FOR PUBLIC SCHOOLS

STATE

Leroy F. Greene School Facilities Act of 1998 (SB 50)

The Leroy F. Greene School Facilities Act of 1998, also known as Senate Bill 50 (Stats. 1998, Ch. 407), governs a school district's authority to levy school impact fees.

Senate Bill (SB) 50 and Proposition 1A provide a comprehensive school facilities financing and reform program by primarily authorizing a \$9.2 billion school facilities bond issue, school construction cost containment provisions, and an eight-year suspension of the Mira, Hart, and Murrieta court cases. Specifically, the bond funds are to provide \$2.9 billion for new construction and \$2.1 billion for reconstruction/modernization needs. The provisions of SB 50 prohibit local agencies from denying either legislative or adjudicative land use approvals on the basis that school facilities are inadequate and reinstate the school facility fee cap for legislative actions (e.g., general plan amendments, specific plan adoption, zoning plan amendments). According to Government Code Section 65996, the development fees authorized by SB 50 are deemed to be full and complete school facilities mitigation.

LOCAL

City of Shasta Lake General Plan

TABLE 4.11.2-1
PROJECT CONSISTENCY WITH CITY OF SHASTA LAKE
GENERAL PLAN: SCHOOLS

General Plan Objectives & Policies	Consistent with General Plan?	Analysis
Schools - Objectives		
PF-10 Develop a land use pattern that can be adequately served with community facilities such as schools, libraries, and community recreation facilities.	Yes	The Area Plan states ten acres shall be set aside within the Area Plan for potential future development of a new school by the Gateway Unified School District. A specific location for a future school is not identified on the Area Plan map; however, a school may be located in any sub-area of the project. Each sub-area will be master planned at the time a subsequent tentative subdivision map is submitted to ensure a school is properly sited.
Schools - Policies		
PF-e The City will cooperate and coordinate its planning with the Gateway Unified School District and develop plans that respond to the growth of the City.	Yes	The City has had several meetings with the Gateway Unified School District to discuss future school needs. Additional meetings will occur during review of subsequent tentative subdivision maps to identify any necessary site-specific school facilities.
PF-f Public uses (e.g. schools, parks, waste disposal sites) and public utilities (e.g. substation, transmission lines) whose site specific locations often cannot be identified in advance by the General Plan may be	Yes	Public uses and facilities are allowed in all sub-areas for the project. At the time subsequent tentative subdivision maps are submitted to the City, additional meetings will be held with the School District and other interested agencies to determine

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General Plan Objectives & Policies	Consistent with General Plan?	Analysis
permitted throughout the City to serve the public need. Appropriate zoning on site specific locations will be determined in response to the identified need as it occurs. Solid waste disposal facilities shall be conditionally permitted to ensure that the site is compatible with adjacent land uses. Surrounding land uses, to the extent feasible, shall be regulated to avoid incompatibility with the solid waste disposal facility.		specific needs.

4.11.3.3 IMPACTS AND MITIGATION MEASURES FOR PUBLIC SCHOOLS

STANDARDS OF SIGNIFICANCE

The impact analysis provided below is based on the following State CEQA Guidelines Appendix G thresholds of significance, which state that a project would have a significant impact if it would:

- 1) Result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times, or other performance objectives for schools.

METHODOLOGY

Evaluation of potential impacts to public schools as a result of the proposed project was based on a review of the City of Shasta Lake's General Plan and the California Department of Education's School Accountability Report Card (CDE 2012).

IMPACTS AND MITIGATION MEASURES

Provision of New School Facilities in Order to Maintain Service (Standard of Significance 1)

Impact 4.11.3.1 Buildout of the proposed project will increase the number of school-aged children and attendance at Grand Oaks Elementary School. This impact is considered **less than significant**.

Full buildout of the proposed Area Plan is anticipated to occur in 10 to 20 years. Based on student yield generation factors estimated by the Gateway Unified School District (Harrell 2012a), the student generation rate for new residential development is 0.5 elementary students per housing unit and 0.2 high school students per housing unit. This rate is the same as the California Department of General Services' generation rate (DOGS 2008), but may not reflect the actual student yield within the GUSD.

Student yield per unit is different in each school district and varies by housing density. Often, there are fewer students per unit as the density increases. The proposed project has a mix of densities including between 202 and 428 high-density units (**Table 3.0-1**). The district would use

the student generation estimates for this and other projects in the district to determine the appropriate size of new facilities or assess the capacity of existing facilities. The district is in the process of updating student yield and facility need information as part of the district's master plan (Harrell 2012b). Using the base rate of 0.7 students per housing unit, the proposed project could generate 1,223 new students for the GUSD (**Table 4.11.3-2**).

TABLE 4.11.3-2
AREA PLAN STUDENT GENERATION AT BUILDOUT

	Area Plan Growth Potential (in # of units)	Generation Rate	Additional Students at Theoretical Buildout of General Plan
Residential Units	1,604	0.7	1,123

California Government Code Section 65995(h) states that *“the payment or satisfaction of a fee, charge or other requirement levied or imposed...[is] deemed to be full and complete mitigation of the impacts of any legislative or adjudicative act, or both, involving, but not limited to, the planning, use, or development of real property, or any change in governmental organization or reorganization as defined in Section 56021 or 56073, on the provision of adequate school facilities.”* As discussed under the Funding subsection above, the Gateway Unified School District currently levies fees for new development.

California Government Code Section 66478 states the requirement of dedication shall be imposed at the time of approval of the tentative map. If, within 30 days after the requirement of dedication is imposed by the city or county, the school district does not offer to enter into a binding commitment with the subdivider to accept the dedication, the requirement shall be automatically terminated.

The required dedication may be made any time before, concurrently with, or up to 60 days after, the filing of the final map on any portion of the subdivision. The school district shall, in the event that it accepts the dedication, repay to the subdivider or his successors the original cost to the subdivider of the dedicated land, plus a sum equal to the total of the following amounts:

- The cost of any improvements to the dedicated land since acquisition by the subdivider.
- The taxes assessed against the dedicated land from the date of the school district's offer to enter into the binding commitment to accept the dedication.
- Any other costs incurred by the subdivider in maintenance of such dedicated land, including interest costs incurred on any loan covering such land.

If the land is not used by the school district, as a school site, within 10 years after dedication, the subdivider shall have the option to repurchase the property from the district for the amount paid therefor.

At this time, the GUSD is uncertain whether they will need an expansion of existing facilities or creation of a new school in the district (Harrell 2012b). On September 14, 2012, the GUSD informed the City of Shasta Lake that based on projected student yield, the following was needed (see **Appendix 4.11-1**):

4.11 PUBLIC SERVICES

- The GUSD requests that 20 acres in Area G be set aside for a new school site that would include recreation fields (softball, soccer, etc.) adjacent to the school site that would be a shared-use facility with the City of Shasta Lake. The school site would be located on one of the main thoroughfares in the developed area.
- The GUSD requests that Area R (4.5 acres) be reserved for the district to allow for expansion of Grand Oaks Elementary School.
- The developer (Mountain Gate Meadows, LLC) will negotiate with the City of Shasta Lake to trade the Redevelopment Agency (RDA) parcels located south of Grand Oaks Elementary School with Area R and set aside this section for the district.

While the proposed project had been under review since issuance of the Notice of Preparation, the GUSD letter of September 14, 2012, was the first indication that the district needed a school site within the project boundaries. Further, the letter seemed to indicate a need for both the expansion of Grand Oaks Elementary School and a new school site, which seemed in excess of the impacts associated with the project. To clarify the needs of the district, a meeting was held on October 3, 2012, with the City, the applicant, and the GUSD, to fully explain the scope of the proposed project and to discuss the request for a school site. The City also reviewed the legal requirements for establishing a school site, as well as the roles of the City and the applicant in the school site reservation process.

During the meeting, the district clarified that they were in the process of updating their master plan and evaluating their overall facility needs and that they did not currently know whether a school site would be required, or if required, the size and configuration of the site (**Appendix 4.11-2**). Because additional subdivision of the land is required before any new homes can be built, the City and the district agreed to continue working together, but to determine the need for the additional school properties during subsequent entitlement phases.

Mitigation Measures

MM 4.11.3.1 The applicant shall set aside 10 acres within the Area Plan for potential future development of a new school by the Gateway Unified School District (GUSD). The 10 acres shall be made available for purchase by the GUSD for a period of three years from the date of the approval of the first small-lot tentative map. In the event the GUSD elects not to purchase the site, the applicant shall be permitted to subdivide the site for future development consistent with the Area Plan.

Timing/Implementation *Reviewed prior to approval of any subsequent tentative subdivision maps*

Enforcement/Monitoring: *City of Shasta Lake Development Services Department*

Implementation of this mitigation would result in **less than significant** impacts.

4.11.3.4 CUMULATIVE SETTING, IMPACTS, AND MITIGATION MEASURES FOR PUBLIC SCHOOLS

CUMULATIVE SETTING

The cumulative setting for public school impacts includes the district boundaries for the Gateway Unified School District. Any existing, planned, proposed, approved, and reasonably foreseeable development in the cumulative setting could result in cumulative impacts.

CUMULATIVE IMPACTS AND MITIGATION MEASURES

Cumulative Impacts to School Facilities

Impact 4.11.3.2 The proposed project, in combination with foreseeable development proposed in the city, would result in a cumulative increase in student enrollment. This would be considered a **less than cumulatively considerable** impact.

The proposed project would contribute cumulatively to increasing demands and capacity constraints on the local school district. However, the GUSD does not know whether a new school is needed at this time. Mitigation measure **MM 4.11.3.1** is intended to restrict future development potential in until the district's master plan update is completed. As projects are approved, including those within the proposed project area, the City will coordinate with the GUSD regarding the need for additional facilities. While a new school might have environmental impacts, given the uncertainty of size, type, location, or need for a school site, it is premature to conduct an environmental analysis for a new school facility as part of this DEIR. Any future school facilities will be required to conduct environmental review. As noted above, impacts to schools are considered fully mitigated through the payment of required development impact fees. This impact is considered **less than cumulatively considerable**.

Mitigation Measures

None required.

4.11.4.1 EXISTING SETTING FOR PARKS

PARKS SETTING

The Shasta Dam Area Public Utility District oversees and manages park and recreation resources within the city limits. **Table 4.11.4-1** provides an overview of park and recreation facilities in the city.

**TABLE 4.11.4-1
PARK AND RECREATION FACILITIES
CITY OF SHASTA LAKE**

Facility	Acres	Facility Type	Activities
Margaret V. Polf Regional Park	25.3	Community Park	Soccer, softball, football, bicycle-motocross track.
Harold T. "Bizz" Johnson Park	5.91	Community Park	Baseball.
Wynne Price Field	5.00	Community Park	Baseball. Facilities include lighting, covered stands,

4.11 PUBLIC SERVICES

Facility	Acres	Facility Type	Activities
			restrooms, and concession stands.
Clair Engle Park	2.75	Community Park	Community Center, outdoor stage, playground equipment, skateboard park, picnic facilities, barbecue pits.
Akard Park	2.99	Neighborhood Park	Tennis-basketball court, small practice baseball field.
Shasta Park	0.50	Neighborhood Park	Children's play area.
Blue Canyon Park	1.50	Neighborhood Park	Playground, lawn area, picnic tables, natural open space.
John Beaudet Community Center		Community Center	Community meeting facilities, kitchen facilities, senior center, private parties, weddings.
City Bicycle System	4.00	Bicycle System	Bike lanes along Shasta Dam Boulevard and Ashby Road. Bike routes throughout the City.
City Trail System	1.50	Trail System	Walking, jogging, and nature trails.

Source: City of Shasta Lake 2005

4.11.4.2 REGULATORY FRAMEWORK FOR PARKS

STATE

Quimby Act

The goal of the 1975 Quimby Act (California Government Code Section 66477) was to require developers to help mitigate the impacts of property improvements by requiring them to set aside land, donate conservation easements, or pay fees for park improvements. The Quimby Act gave authority for passage of land dedication ordinances only to cities and counties, thus requiring special districts to work with cities and/or counties to receive parkland dedication and/or in-lieu fees. The fees must be paid and land conveyed directly to the local public agencies that provide parks and recreation services community-wide. Revenues generated through the Quimby Act cannot be used for the operation and maintenance of park facilities (Westrup 2002).

Originally, the Quimby Act was designed to ensure "adequate" open space acreage in jurisdictions adopting Quimby Act standards (e.g., 5 acres per 1,000 residents). In some California communities the acreage fee was very high where property values were high, and many local governments did not differentiate on their Quimby fees between infill projects and greenbelt developments. In 1982, the Quimby Act was substantially amended via Assembly Bill (AB) 1600. The amendments further defined acceptable uses of or restrictions on Quimby funds, provided acreage/population standards and formulas for determining the exaction, and indicated that the exactions must be closely tied (nexus) to a project's impacts as identified through traffic studies required by CEQA. In other words, AB 1600 requires agencies to clearly show a reasonable relationship between the public need for the recreation facility or parkland and the type of development project upon which the fee is imposed (Westrup 2002).

LOCAL

City of Shasta Lake General Plan

The City of Shasta Lake General Plan provides goals and policies related to parks services. **Table 4.11.4-2** analyzes the project's consistency with these relevant policies. While this Draft EIR analyzes the project's consistency with the General Plan pursuant to CEQA Section 15125(d), it is the City of Shasta Lake Planning Commission and/or City Council that will make the determination of the project's consistency with the identified General Plan policies.

TABLE 4.11.4-2
PROJECT CONSISTENCY WITH CITY OF SHASTA LAKE
GENERAL PLAN: PARKS

General Plan Objectives & Policies	Consistent with General Plan?	Analysis
Open Space, Parks, and Recreation Objectives		
OSR-2 Provide public access to open-space and recreation resources consistent with the need to protect these resources and consider the rights of private property owners.	Yes	The project proposes 221 acres of open space for wetland preservation and trails.
OSR-3 Establish, integrate and maintain "natural" and "man-made" greenbelt areas along existing creeks, floodplains, natural open space areas, certain roadways, bike and trail systems.	Yes	The Mountain Gate at Shasta Area Plan contains a Policy for Parks, Open Space and Trails, that states that "no development shall occur within designated wetland and open space areas unless reviewed by the City and evaluated for potential impacts."
OSR-4 Link existing and future development in a manner that provides open space and recreational opportunities.	Yes	The project proposes 221 acres of open space for wetland preservation and trails as well as 27.9 acres of developed parkland.
Open Space, Parks, and Recreation Implementation Measures		
OSR-(1) Provide 5 acres of neighborhood, community and creekside parks per 1,000 new residents. Strive to maintain a neighborhood park standard of at least 0.9 acres per 1,000 new residents.	Yes	The project proposes two neighborhood parks totaling 14.9 acres, one community park of 13 acres, and 221 acres of open space with recreational trails. The expected population at buildout is expected to be 4,138 residents. Therefore the proposed Area Plan would provide 6.74 acres of neighborhood and community parks per 1,000 new residents and 53 acres of open space with recreational amenities (creekside park) per 1,000 new residents. Combined, the Area Plan would provide 60 acres of neighborhood, community, and creekside parks per 1,000 new residents.
OSR-(6) Require developers and/or property owners to waive their right to protest formation of landscape and lighting assessment or other City maintenance districts as a condition of approval of new development.	Yes	The Area Plan includes: • A public services plan for all services within the Plan Area. • A financial plan estimating costs of the project to the City. • A recommendation for a community financing district (CFD) to ensure proper maintenance of services and facilities. • A fiscal impact analysis showing potential revenue/expenditure for 20 years.

4.11 PUBLIC SERVICES

City of Shasta Lake Park System Master Plan

The City's *Park System Master Plan* (2005) provides a plan for Shasta Lake to meet the community's needs for more parkland, trails, sport fields, specialized facilities, and recreation programs. The master plan assesses the need for recreation facilities and presents a strategy for meeting those needs.

4.11.4.3 IMPACTS AND MITIGATION MEASURES FOR PARKS

STANDARDS OF SIGNIFICANCE

The impact analysis provided below is based on the following State CEQA Guidelines Appendix G thresholds of significance. A park impact is significant if implementation of the proposed Area Plan would:

- 1) Increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated.
- 2) Include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment.

METHODOLOGY

The impact analysis below focuses on whether those impacts would have a significant effect on the physical environment.

IMPACTS AND MITIGATION MEASURES

Provision of Park Facilities in Order to Maintain Service (Standards of Significance 1 and 2)

Impact 4.11.4.1 Buildout of the proposed project would increase the demand for additional park and recreational facilities. This would be a **less than significant** impact.

Under a buildout scenario, the project would result in a population increase of 4,138 persons (see Section 4.2, Population/Housing/Employment). The project would include two neighborhood parks totaling 14.9 acres, a community park totaling 13 acres, and open space surrounding the project site's stream areas occupying 221 acres that would add to the recreational opportunities currently available in the city. The current standard for parkland dedication is 5 acres per every 1,000 new residents. In addition, Section 16.08.100(B) of the City's Subdivision Code states that the amount of land required to be dedicated or irrevocably offered for dedication for park or recreational purposes shall not exceed 1 acre per 100 lots or fraction thereof.

The proposed Area Plan would provide 6.74 acres of neighborhood and community parks per 1,000 new residents and 53 acres of open space with recreational amenities (creekside park) per 1,000 new residents. Combined, the Area Plan would provide 60 acres of neighborhood and creekside parks per 1,000 new residents. This acreage is well above the General Plan standard of 5 acres of neighborhood and creekside parks per 1,000 residents.

Mitigation Measures

None required.

4.11.3.5 CUMULATIVE SETTING, IMPACTS, AND MITIGATION MEASURES FOR PARKS

CUMULATIVE SETTING

The cumulative setting for recreation includes the project, surrounding development in the area, and the City of Shasta Lake.

CUMULATIVE IMPACTS AND MITIGATION MEASURES

Cumulative Impacts on Parks, Recreational Facilities, and Trails

Impact 4.11.4.2 The proposed project and other foreseeable development would require additional park and recreation facilities in the City of Shasta Lake. This would be a **less than cumulatively considerable** impact.

Implementation of the proposed project, in combination with other approved and proposed projects in the City of Shasta Lake, would result in an increased need for additional parks and recreational facilities to serve the area's population. The project proposes open space and parks within the site to serve the future residents of the project, in conformance with the park system concept as identified in the City's *Park System Master Plan* (2005), which plans for a park system that would serve Shasta Lake's population with interconnected and conveniently located park facilities.

According to the master plan, the park system in the City of Shasta Lake needs to be built on a foundation of new and upgraded neighborhood and community parks that provide basic recreational opportunities within a convenient walking distance of most residents. The plan also seeks a goal of connecting parks to other areas throughout the city, including neighborhoods, via on- and off-street trails in order to provide recreation and transportation opportunities in Shasta Lake and to the rest of the region.

As previously stated, the project would include two neighborhood parks totaling 14.9 acres, a community park of 13 acres and open space surrounding the project site's stream areas occupying 221 acres that would add to the recreational opportunities that are currently available in the city. In addition, an internal circulation system, in the form of roads and trails, would link all of the uses in the Area Plan. The system has been designed to encourage walking, biking, and other non-motorized uses. The trails would be located along biologically important areas, such as drainages and wetlands, as well as at the base of slopes. The proposed trails would be separated from roadways in some areas of the project site and adjacent to roadways in others. The Area Plan contains a schematic trail plan, a typical trail design section, and policies that require trail linkages for all land uses (see **Figure 3.0-4**). Policies in the Area Plan require that subsequent development connect to and extend any existing trail system.

New development within the Area Plan boundaries would be required to provide for recreational facilities through fees or the development of additional park facilities in compliance with City requirements for future residents. Additionally, it is anticipated that the park fees would be used to develop additional park and recreational facilities and maintain existing park facilities. The development of future parks and recreational facilities would be subject to the environmental review process. This is a **less than cumulatively considerable** impact.

Mitigation Measures

None required.

4.11 PUBLIC SERVICES

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4.12 AESTHETICS/VISUAL RESOURCES/LIGHT AND GLARE

4.12 AESTHETICS/VISUAL RESOURCES/LIGHT AND GLARE

This section describes the existing visual resources of the proposed project, summarizes the landscape characteristics of the site and surrounding area, and discusses the impacts associated with the proposed project. The analysis focuses on the anticipated alteration of the landscape characteristics and visual resources in the vicinity of the proposed project. Visual impacts were evaluated using a combination of site reconnaissance, photo documentation, and review of relevant City of Shasta Lake and Shasta County policies.

4.12.1 EXISTING SETTING

PHYSICAL SETTING

Aesthetics/Visual Characteristics of the Project Site

Historical uses of the proposed property include ranching and grazing activities. Currently there are no ranching and grazing activities on-site. The property consists of open grassland, oak woodlands, riparian habitat, wetlands, ephemeral streams, and two primary creek drainages known as Moody Creek and Rancheria Creek.

Existing topography within the project site generally consists of meadow with natural vegetation that includes valley oaks, grey pine, manzanita, and grassland. Except for some informal trails and large freeway-oriented advertising signs, the property is undeveloped. Man-made structures on the site are limited to fencing. The elevation of the project site ranges from approximately 800 to 950 feet. Typical views of the project site are shown in **Photos 4.12-1** through **4.12-4**.



PHOTO 4.12-1
VIEW OF SHASTA BALLY PEAK LOOKING SOUTHWEST FROM THE
CENTER OF THE PROJECT AREA



PHOTO 4.12-2
VIEW FACING EAST FROM CENTER OF PROJECT AREA

4.12 AESTHETICS/VISUAL RESOURCES/LIGHT AND GLARE



PHOTO 4.12-3
VIEW FACING NORTH TOWARD THE SHASTA DAM
RESERVOIR



PHOTO 4.12-4
VIEW FACING EAST, LOOKING AT INTERSTATE 5 FROM THE
PROJECT SITE

SURROUNDING AREAS

The proposed project is located in the northeast section of the City of Shasta Lake, approximately 8 miles north of Redding adjacent to the west side of Interstate 5 (I-5) between the Mountain Gate and Shasta Dam Boulevard interchanges in Shasta County.

The City of Shasta Lake is located in Shasta County, an area with many scenic vistas. The Sacramento Valley and the foothills of the Cascade and Klamath mountain ranges meet in the Shasta Lake area. This convergence of geographic features creates hill and mountain views north, east, and west of the city, with Shasta Bally being the most prominent feature. In other parts of the city, Mount Shasta and Lassen Peak, two prominent mountains in the Cascade Range, are visible. The Sacramento River, which flows through the center of the city, adds to the aesthetic value of the area.

The California Streets and Highways Code has listed portions of I-5 and State Route 151 in Shasta County as being eligible for official designation as scenic highways:

- The entire length of I-5 from Redding to Shasta Lake
- The entire length of State Route 151 to Shasta Dam

Nighttime Lighting Conditions

Current nighttime lighting conditions in the City of Shasta Lake are directly correlated with existing development. The city is primarily developed west of I-5, which generally runs north-south through the eastern half of the city. The business district, located along Shasta Dam Boulevard, generally has low ambient nighttime light levels, with residential and outlying areas of the city consisting of even lower ambient light levels.

4.12.2 REGULATORY FRAMEWORK

STATE

California Scenic Highway Program

The California Scenic Highway Program intends to preserve and protect scenic highway corridors from change that would diminish the aesthetic value of lands adjacent to scenic highways. The State Scenic Highway System includes a list of highways that are either eligible for designation as scenic highways or have been so designated. Cities and counties can nominate eligible scenic highways for official designation by identifying and defining the scenic corridor of the highway. The municipality must also adopt ordinances to preserve the scenic quality of the corridor or document such regulations that already exist in various portions of local codes. The California Department of Transportation (Caltrans) administers the California Scenic Highway Program.

There are no officially designated state scenic highways located on, adjacent to, or near the project site. The nearest routes eligible for inclusion in the California Scenic Highway Program are State Route 151 between I-5 and Shasta Dam, and I-5 from Redding to Shasta Lake. These segments offer limited distant views of the project site.

LOCAL

City of Shasta Lake General Plan

The City of Shasta Lake General Plan identifies specific policies regarding aesthetics. **Table 4.12-1** analyzes the project's consistency with City of Shasta Lake General Plan policies. While this Draft EIR analyzes the project's consistency with the General Plan pursuant to California Environmental Quality Act (CEQA) Section 15125(d), it is the City of Shasta Lake Planning Commission and/or City Council that will make the determination of the project's consistency with the identified General Plan policies.

TABLE 4.12-1
PROJECT CONSISTENCY WITH CITY OF SHASTA LAKE
GENERAL PLAN: AESTHETICS

General Plan Objectives & Policies	Consistent with General Plan?	Analysis
Land Use Objectives		
LU-(5) For development along Cascade and Twin View Boulevards, adopt appropriate standards to improve the character of these corridors, including but not limited to site access, building and off-street parking orientation to street, building height, on-site lighting, transitional requirements adjacent to residential uses, and incentives to encourage office/residential mixed use.	Yes	The Area Plan was designed to encourage residential mixed-use/office use and with the requirements for a mix of land uses.
Circulation Policies		

4.12 AESTHETICS/VISUAL RESOURCES/LIGHT AND GLARE

General Plan Objectives & Policies	Consistent with General Plan?	Analysis
C-6 Designate local scenic routes and enhance and protect their scenic qualities.	Yes	The California Streets and Highways Code lists portions of two state highways in Shasta County as being eligible for official designation as scenic highways: (1) the entire length of I-5 from Redding to Shasta Lake, and (2) the entire length of State Route 151 to Shasta Dam. The portion of I-5 eligible for official designation as a scenic highway terminates prior to the Area Plan. The Area Plan has been designed to enhance SR 151 to Shasta Dam.
C-k Establish Route 151 between North Boulevard and Shasta Dam, Shasta Park to Digger Bay, and the existing and future road segment of Wonderland Boulevard (changed to Cascade Boulevard) between Shasta Dam Boulevard and Mountain Gate Interchange with I-5 as scenic routes.	Yes	See consistency analysis for Policy C-6 above.
C-(17) As part of the development review process, include consideration of the visual aspects of the development from roadways. Aesthetic consideration shall include architectural compatibility and landscaping. Development review will include visibility requirements at intersections.	Yes	Area Plan Policy Section 3.1, General Policies, Policy 3 states that site planning shall consider the natural terrain of the lot, the existence of significant native trees (over 10 inches diameter at breast height [dbh]) and vegetation, and shall conform to the provisions of the City of Shasta Lake Hillside Development Ordinance unless an exception is approved by the City.

City of Lake Shasta Municipal Code

The City of Shasta Lake adopted Ordinance 04-165 with the intent to promote the conservation of a healthy tree population and to maintain and enhance the tree canopy throughout the community. According to Section 12.36.010(C) of the City's Municipal Code, this goal is to be accomplished through the preservation of existing native and non-native trees where feasible, the replacement or transplanting of trees removed where appropriate, and the planting of new trees in locations, number, and kind compatible with local conditions.

Subdivision and Other Development Projects

The City of Shasta Lake requires that subdivisions and other development projects be designed to minimize destruction or damage to "protected trees." Section 12.36.030 of the Municipal Code defines a protected tree as (1) any living tree, except gray pine (*Pinus sabiniana*), having at least one trunk of 10 inches or more diameter at breast height; or (2) a tree that is required to be preserved under discretionary project approval or under a site development tree plan that is approved administratively by the Director of Development Services.

To achieve the goal of preservation, the Planning Commission may consider tree preservation as adequate grounds to approve variances associated with building setbacks, building separations, parking requirements, and driveway grades if the Commission determines that: (1) the preservation and retention of a protected tree outweighs the disadvantages associated

with any variance granted to save it and (2) there is a real expectation that the tree will survive for more than five years (Ordinance 04-165 Section 1 (part)).

Chapter 15.08, Grading, Erosion Control, and Hillside Development, of the City's Municipal Code regulates development on hillsides and along ridgelines.

4.12.3 IMPACTS AND MITIGATION MEASURES

SIGNIFICANCE CRITERIA

Based on Appendix G of the CEQA Guidelines, the City concludes that a project may have significant impacts on aesthetics and visual resources if it does any of the following:

- 1) Has a substantial adverse effect on a scenic vista.
- 2) Substantially damages scenic resources, including but not limited to trees, rock outcroppings, and historic buildings within a state scenic highway.
- 3) Substantially degrades the existing visual character or quality of the site and its surroundings.
- 4) Creates a new source of substantial lighting and glare which would adversely affect day or nighttime views in the area.

METHODOLOGY

This visual resource analysis is based on field surveys and reviews of existing and proposed topographic conditions of the proposed project site in relation to the surrounding area. The project's proposed mixed-use design features were considered in the analysis. This included topographic mapping, grading plans for the project-level roadway connection proposal between the Mountain Gate/Wonderland Boulevard interchange to the north and Shasta Dam Boulevard to the south, and estimation of potential building heights. Estimation of building heights was based on height restrictions in Section 17.54.060(C) of the City of Shasta Lake Municipal Code (i.e., structural height limit is 35 feet, except when located within 40 feet of a residential district, in which case it is one story not to exceed 20 feet).

An overall visual sensitivity approach was employed to analyze the existing landscape visual quality, viewer concern, and overall viewer exposure to the project. To assess possible visual changes resulting from the project, staff considered the contrasts of project developments in relation to the existing landscape and potential blockage of currently visible features.

IMPACTS AND MITIGATION MEASURES

Have a Substantial Adverse Effect on a Scenic Vista (Standard of Significance 1)

Impact 4.12.1 Buildout of the proposed project could substantially alter scenic vistas of the surrounding natural area. Development of the proposed project would have a **potentially significant** effect on scenic vistas.

Although there are no officially designated scenic vistas in the project area, depending on location and elevation, certain areas of the site feature expansive, unobstructed views of the

4.12 AESTHETICS/VISUAL RESOURCES/LIGHT AND GLARE

surrounding rural area. These views generally include natural vegetation, open space, and hilltops and are considered an important component of the area's visual character. The property consists of open grassland, oak woodlands, riparian habitat, wetlands, ephemeral streams, and two primary creek drainages known as Moody Creek and Rancheria Creek. Except for some informal trails and large freeway-oriented advertising signs, the property is undeveloped.

Approval and implementation of the proposed project would result in the phased construction of a variety of large structures and associated infrastructure. Proposed development associated with the project would be limited to 354 acres of the 590-acre site, as approximately 221 acres of the site would be reserved for open space and an additional 14.9 acres would be used as parkland.

Elevation of the project site ranges from approximately 800 to 950 feet. As stated in Section 4.8, Geology and Soils, the project site is surrounded by steep hill terrain. Three-quarters of the property slopes gently from north to south with little topographic relief, and the southern quarter of the property and small portions on the western boundary have steep-dipping hills with up to 150 feet of relief.

A total of 15.8 acres of the project site has slopes in excess of 30 percent. For the most part, slopes over 30 percent are proposed for low-density residential and open space land uses. The future development under the proposed project would be required to comply with City Municipal Code Sections 15.08.270 and 15.08.280, which set forth rules and regulations to control development on hillsides and along ridgelines. For instance, these regulations mandate that construction grading be designed to preserve natural features, such as knolls or ridgelines, and that the natural contour and vegetation of skyline ridges remain intact, with development maintaining an undisturbed minimum setback of 200 feet measured horizontally from the center of the ridgeline on a topographic map or 50 feet measured vertically on a cross section, whichever is more restrictive.

In addition, the future development under the proposed project would be required to comply with the provisions of Section 17.54.060(C) of the City of Shasta Lake Municipal Code, which sets a structural height limit for buildings at 35 feet, except when located within 40 feet of a residential district, in which case it is one story not to exceed 20 feet. Adherence to Section 17.54.060 of the Municipal Code would assist in retaining much of the existing views of natural vegetation and hilltops, and future development would not be expected to block expansive views from the higher elevations of the project site.

The proposed project would also require the construction of a 1.0-million-gallon water storage tank, located either to the northwest of the Area Plan or at the northerly area of the Area Plan as shown on **Figure 4.10-1**. The following mitigation would require that this facility be adequately screened from view by a combination of existing and planted vegetation.

Mitigation Measures

MM 4.12.1 The project developer shall be required to ensure adequate screening of the proposed water storage tank with existing and/or newly planted vegetation.

Timing/Implementation: Prior to approval of water storage tank improvement plan

Enforcement/Monitoring: City of Shasta Lake Development Services Department

There are no officially designated scenic vistas in the project area. Approximately 221 acres of the 590-acre site would be reserved for open space and an additional 14.9 acres would be used as parkland. Municipal Code requirements regarding hilltop and ridgeline development would protect these features on the project site, and the Municipal Code also restricts the height of future buildings in the Area Plan to less than 35 feet. Lastly, mitigation measure **MM 4.12.1** requires screening of the proposed water storage tank. For all of these reasons, this impact would be considered **less than significant**. Impacts associated with the overall change in visual character of the project site, as well as impacts associated with views of the project site from the surrounding area, are discussed under Impact 4.12.3 below.

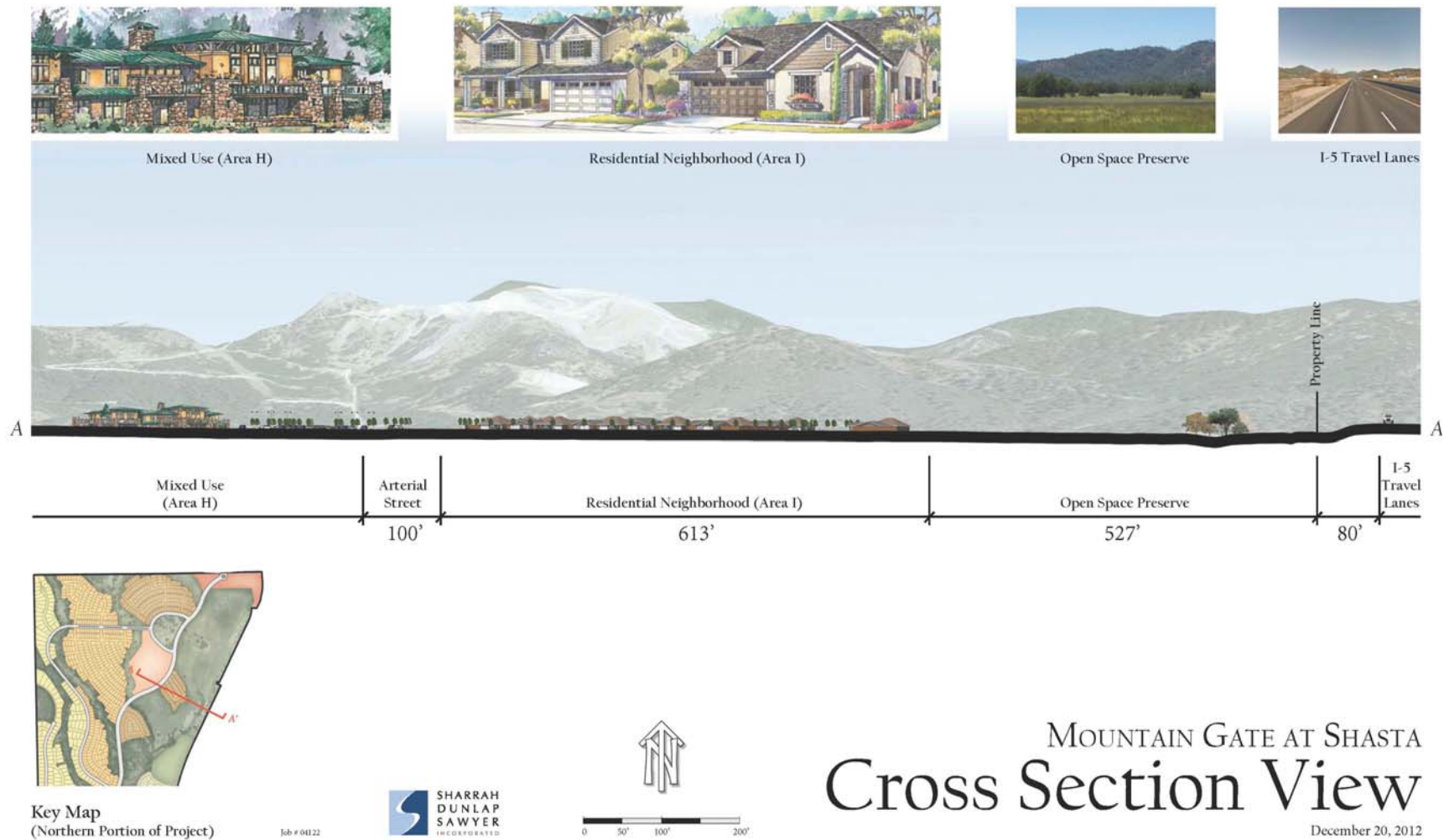
Substantially Damage Scenic Resources Within a State Scenic Highway (Standard of Significance 2)

Impact 4.12.2 Buildout of the proposed project would alter the existing landscape characteristics of the project site, as seen from Interstate 5, from primarily vacant to urban. This would be a **potentially significant** impact.

There are no officially designated state scenic highways located on, adjacent to, or near the project site. The nearest routes eligible for inclusion in the California Scenic Highway Program are State Route 151 between I-5 and Shasta Dam, and I-5 from Redding to Shasta Lake. The State Route 151 segment offers limited distant views of the project site. The portion of I-5 eligible for official designation as a scenic highway terminates at the southern limits of the City of Shasta Lake, which is prior to the Area Plan.

While this view includes natural landscape characteristics associated with mountains, ridgelines, and the tree canopy, recent development in the southern portion of the city has altered the natural conditions from this view. Views of proposed features in this area would be obscured as a result of topographic conditions, distance of the view (over 2 miles), and intervening trees. **Figure 4.12-1** shows a cross section of the site as seen from I-5.

FIGURE 4.12-1
CROSS SECTION VIEW (NOT TO SCALE)



However, the project proposes the removal of 617 trees on the proposed site. Removal of these trees would result in future homesites being visible from I-5 and State Route 151.

The project applicant has provided conceptual development guidelines and design standards that would include many techniques to blend into the natural surroundings and minimize impacts on views from I-5 and State Route 151. The roadway network has a number of different road widths and designs intended to minimize the amount of grading and pavement needed to serve the Area Plan.

Residential communities with variable lot sizes and densities are identified on the conceptual land use plan in the proposed project, and a residential theme is encouraged in each community. A variation in building facades would create diversity and avoid monotony in the proposed project. In addition, the following mitigation is required.

Mitigation Measures

MM 4.12.2a The proposed project shall be required to submit design guidelines that will regulate the design of all building and landscaping for the project. Residential and other building designs shall be required to utilize earth-tone colors and materials in their architectural design in order to complement the existing landscape features of the project area. No aboveground structures shall be allowed along ridgelines or hilltops on the project site in conformance with Municipal Code Section 15.08. The design guidelines shall be reviewed and approved by the City of Shasta Lake Development Services Department.

Timing/Implementation: Prior to improvement plan submittal

Enforcement/Monitoring: City of Shasta Lake Development Services Department

MM 4.12.2b All project hardscape features, such as parking lots, shall be designed to blend with existing landscape characteristics. Such features shall be screened from off-site views through the use of native vegetation, landscaping, natural features, and other appropriate screening measures.

Timing/Implementation: Prior to improvement plan approval

Enforcement/Monitoring: City of Shasta Lake Development Services Department; City of Shasta Lake Department of Public Works

MM 4.12.2c A landscape plan shall be submitted to the City of Shasta Lake. Landscaping shall consist of vegetation and features characteristic of the area and shall be installed prior to completion of the project. This screening is intended to blend development features into the landscaped characteristics of the area so as to not dominate the view.

Timing/Implementation: Prior to improvement plan approval

Enforcement/Monitoring: City of Shasta Lake Development Services Department, City of Shasta Lake Department of Public Works

4.12 AESTHETICS/VISUAL RESOURCES/LIGHT AND GLARE

These mitigation measures would require that project features be designed to blend with the existing landscape characteristics of the area and not result in features that silhouette a hilltop or ridgeline. With implementation of the above mitigation, the visual impacts of the project from scenic highways would be **less than significant**.

Substantially Degrade Existing Visual Character or Quality of the Site (Standard of Significance 3)

Impact 4.12.3 Buildout of the proposed project would convert approximately 354 acres of the project site from moderately disturbed land to a mixed-use urban development. This is a **less than significant** impact.

The construction of 1,604 residential units, 195,584 square feet of nonresidential land uses, and associated roadways and infrastructure on a currently vacant site would alter existing views of the project site, where available, and would alter the character of the site from vacant to residential/commercial urban-type development.

In order to determine the extent to which conversion of the project site would result in significant visual effects from public views, visual evaluations of the project site were performed for views along the Mountain Gate and Shasta Dam Boulevard interchanges and Interstate 5. The visual evaluation took into account existing topography and vegetation conditions as well as anticipated modifications to topography from buildout of the project (grading activities). In addition, the analysis took into account the proposed open space, parks, wetlands preserve, residential areas, commercial areas, and roads. Existing conditions and visual evaluations for views of the project site as seen from Interstate 5 are illustrated in **Photo 4.12-4**. The visual evaluations assumed residential areas, commercial areas, and the proposed extension of Cascade Boulevard.

The character of the proposed project is to develop, as an extension of the City of Shasta Lake, an extensive number of urban/suburban structures in an area that is more or less undeveloped. The development, and the related visual changes to the setting as a result of that development, would constitute a transition from the primarily open grassland and oak woodland landscape to an urbanized community. The woodland nature of the project site may be said to be “pleasant” in its undeveloped state. However, it has not been recognized as unique or highly scenic. Also, due to intervening topography and tree cover, the site is not exposed to a high degree of public viewing.

Although the extent of the visual transition and impact would be substantial, those changes would not necessarily be negative. With urban-type development, the standards for judging aesthetic quality and attractiveness are primarily based on architectural and landscape design concepts rather than on natural or pastoral aesthetic standards. Future development under the proposed project would possess high quality architectural and landscaping design concepts in compliance with Section 17.54.060 of the City of Shasta Lake Municipal Code, which establishes development standards for mixed-use development.

The character of the site would be significantly altered as it becomes an extension of the City of Shasta Lake. However, the City does not consider that the resulting visual setting, with high quality standards of urban and landscape design, would be aesthetically disagreeable or adverse to the visual resources of the area.

All development phases and building permits would be required to comply with the policies and standards of Area Plan Section 3.0, Area Plan Policies. For example, Area Plan Policy Section 3.1, General Policies, Policy 3 states that future site planning under the Area Plan needs to consider

the natural terrain of the lot, the existence of significant native trees (over 10 inches in diameter at breast height) and vegetation, and is required to conform to the provisions of City of Shasta Lake Municipal Code Sections 15.08.270 and 15.08.280, which set forth rules and regulations to control development on hillsides and along ridgelines as described under Impact 4.12.1 above. Another example includes Area Plan Policy Section 3.1, General Policies, Policies 7 and 8, which require that all utilities be installed underground, except for the ordinary necessary aboveground appurtenances for which undergrounding is infeasible, and that all public utilities need to be installed within the roadway right-of-way or within defined easements. Therefore, implementation of the community design standards and guidelines would ensure that visual impacts resulting from the change in land use character would be **less than significant**.

Mitigation Measures

None required.

Create New Sources of Glare (Standard of Significance 4)

Impact 4.12.4 Buildout of the proposed project would introduce some urban uses to a primarily undeveloped and rural area that currently includes few existing sources of glare. This impact is **potentially significant**.

Implementation of the proposed project would introduce a variety of building materials to the site. Glass, roofing, car windshields, etc., have the potential to reflect light and create glare visible for some distance from the site. The extent of this impact would be dependent on the angle of the sun and structure and the type of building material used that could generate a glare effect. Chapter 14.54.060 of the City Municipal Code requires that no use create intense light or glare which causes a nuisance or hazard beyond the property line. Compliance with this requirement can be achieved by subsequent development under the Area Plan avoiding bare metal, highly reflective surfaces (glass, metallic paint, etc.), illuminated roofing, and high contrast or brightly colored glazed tile.

Such measures would substantially reduce the potential for glare from the proposed project. While it is always possible that glare from reflected car windshields, building windows, or other sources could occur, these impacts are considered transitory and based on environmental conditions (e.g., time of day, angle of observer) rather than as part of the design of the project. The following mitigation would ensure compliance with Chapter 14.54.060 of the City Municipal Code.

Mitigation Measures

MM 4.12.4 Project design guidelines shall prohibit the use of reflective material and shall encourage the use of landscaping and other design features to minimize the potential for glare.

Timing/Implementation: Prior to improvement plan submittal/Included in the project design guidelines

Enforcement/Monitoring: City of Shasta Lake Development Services Department; City of Shasta Lake Department of Public Works

4.12 AESTHETICS/VISUAL RESOURCES/LIGHT AND GLARE

Implementation of mitigation measure **MM 4.12.4** would ensure that glare impacts of the proposed project are mitigated to **less than significant** by ensuring compliance with the Municipal Code, which prohibits the creation of intense light or glare that causes a nuisance or hazard beyond the property line.

Increased Nighttime Lighting (Standard of Significance 4)

Impact 4.12.5 The proposed project at buildout would introduce new sources of nighttime lighting and glare, resulting in an increase to ambient nighttime lighting levels. Required street lighting will increase the source of night lighting within the area. The addition of nighttime lights to the project site is considered **potentially significant**.

The proposed project would include sources of artificial light, with night lighting levels more typical of suburban development than the existing open space character of the project site. New light sources include, but are not limited to, the residential units and commercial buildings, streetlights and parking lot lights, and additional light generated by automobiles. Stationary light sources have the potential to adversely affect residents through “spillover” into adjacent properties. However, there are limited nearby residential units adjacent to the project site. New light sources would also result in a greater overall level of light at night, thus reducing night sky visibility and affecting the general character of the existing community.

Although no formal design guidelines have been proposed for the project, the conceptual design standards include outdoor lighting standards that would minimize ambient light and trespassing light levels to preserve existing night views. Policy Section 3.9, Roads, Policy 4 would require that streetlights be provided along all Area Plan streets. Street lighting in residential areas would have to consist of low, decorative fixtures along public walkways providing sufficient illumination for pedestrian safety. Parking lot lighting would be required to be of a decorative nature compatible with the architecture surrounding the parking lot and would prevent light spill to the top and sides. However, no lighting details for other aspects of the project have been developed to determine whether lighting impacts would be avoided. Hence, the following mitigation measures are provided to reduce impacts from nighttime lighting.

Mitigation Measures

MM 4.12.5a Outdoor light fixtures for nonresidential areas (such as the commercial center) shall be low-intensity, shielded, and/or directed away from residential areas and the night sky. All light fixtures shall be designed, installed, and shielded in such a manner that no light rays are emitted from the fixture at angles above the horizontal plane. Lighting plans shall be provided as part of facility improvement plans to the City that identify that illumination levels at adjacent residential areas will not exceed one foot-candle.

Timing/Implementation: Prior to approval of building permits and/or improvement plans

Enforcement/Monitoring: City of Shasta Lake Development Services Department; City of Shasta Department of Public Works

MM 4.12.5b Outdoor lighting for nonresidential uses (i.e., commercial center) shall be designed to be turned off when not in use where security and safety is not a concern. This requirement shall be included in lighting plans submitted to the City as part of the facility improvement plans.

Timing/Implementation: Prior to approval of building permits and/or improvement plans

Enforcement/Monitoring: City of Shasta Lake Development Services Department; City of Shasta Department of Public Works

MM 4.12.5c For outdoor lighting fixtures installed on residences and nonresidential buildings, project design guidelines shall restrict the installation of flood and/or spot lighting fixtures, except when used as part of landscaping. All light fixtures shall be shielded away from adjoining residents and the night sky. Project design guidelines shall be submitted to the City of Shasta Lake Planning Department for review and approval to verify that the lighting standards are in place.

Timing/Implementation: Prior to issuance of building permits

Enforcement/Monitoring: City of Shasta Lake Development Services Department

The use of low-intensity lighting, the strategic placement of landscaping (see mitigation measure **MM 4.12.4**), and proper shielding techniques can assist in reducing nighttime lighting levels. Future development under the proposed project would be subject to the lighting standards identified in mitigation measures **MM 4.12.5a** through **MM 4.12.5c**. In addition, perimeter landscaping and natural vegetation would screen adjacent areas from light intrusion. Therefore, this impact would be considered **less than significant**.

4.12.4 CUMULATIVE SETTING, IMPACTS, AND MITIGATION MEASURES

CUMULATIVE SETTING

The cumulative setting for visual resources consists of the project site, as well as all existing, approved, proposed, and reasonably foreseeable development in the immediate area. The area in this cumulative setting is characterized by rural residential development and open space.

CUMULATIVE IMPACTS AND MITIGATION MEASURES

Cumulative Aesthetic Impacts

Impact 4.12.6 Implementation of the proposed project would contribute to the cumulative conversion of the area from moderately disturbed open space to other urban uses. This impact is considered to be **less than cumulatively considerable**.

As described above, development of the project site with the conceptual development proposed by the Area Plan would have less than significant impacts associated with degrading the visual character and views of the project site as well as introducing new sources of light.

4.12 AESTHETICS/VISUAL RESOURCES/LIGHT AND GLARE

Significant urban development in the surrounding area (cumulative setting) is not expected given that the project site is bounded to the east by I-5, to the south and southwest by the built environment of the city itself, and to the north and west by the city limits boundary. The lands to the north and west beyond the city limits boundary are already designated for mixed-use and commercial development and are planned for development regardless of the proposed Area Plan. Any future projects in the cumulative setting would be designed consistent with applicable policies and project-specific mitigation as part of required environmental review, on a project-by-project basis. Therefore, this impact would be considered **less than cumulatively considerable**.

Mitigation Measures

None required.

4.13 GREENHOUSE GASES AND CLIMATE CHANGE

This section provides a discussion of the potential for construction and operation of the proposed project to result in a significant effect on climate change and energy use. The reader is referred to Section 4.4, Air Quality, for a discussion of project impacts associated with air quality.

4.13.1 EXISTING SETTING

EXISTING CLIMATE SETTING

Since the early 1990s, scientific consensus holds that the world's population is releasing greenhouse gases (GHG) faster than the earth's natural systems can absorb them. These gases are released as byproducts of fossil fuel combustion, waste disposal, energy use, land-use changes, and other human activities. This release of gases, such as carbon dioxide (CO₂), methane (CH₄), and nitrous oxide (N₂O), creates a blanket around the earth that allows light to pass through but traps heat at the surface preventing its escape into space. While this is a naturally occurring process known as the greenhouse effect, human activities have accelerated the generation of GHGs beyond natural levels. The overabundance of GHGs in the atmosphere has led to an unexpected warming of the earth and has the potential to severely impact the earth's climate system.

While often used interchangeably, there is a difference between the terms "climate change" and "global warming." According to the National Academy of Sciences, climate change refers to any significant, measurable change of climate lasting for an extended period of time that can be caused by both natural factors and human activities. Global warming, on the other hand, is an average increase in the atmosphere's temperature caused by increased GHG emissions. The use of the term climate change is becoming more prevalent because it encompasses all changes to the climate, not just temperature.

To fully understand global climate change, it is important to recognize the naturally occurring greenhouse effect and to define the GHGs that contribute to this phenomenon. Various gases in the earth's atmosphere, classified as atmospheric GHGs, play a critical role in determining the earth's surface temperature. Solar radiation enters the earth's atmosphere from space and a portion of the radiation is absorbed by the earth's surface. The earth emits this radiation back toward space, but the properties of the radiation change from high-frequency solar radiation to lower-frequency infrared radiation. GHGs, which are transparent to solar radiation, are effective in absorbing infrared radiation. As a result, this radiation that otherwise would have escaped back into space is now retained, resulting in a warming of the atmosphere. This phenomenon is known as the greenhouse effect. Among the prominent GHGs contributing to the greenhouse effect are CO₂, CH₄, N₂O, hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride (SF₆).

Table 4.13-1 provides descriptions of the primary GHGs attributed to global climate change, including a description of their physical properties, primary sources, and contribution to the greenhouse effect.

4.13 GREENHOUSE GASES AND CLIMATE CHANGE

**TABLE 4.13-1
GREENHOUSE GASES**

Greenhouse Gas	Description
Carbon Dioxide (CO ₂)	Carbon dioxide (CO ₂) is a colorless, odorless gas. CO ₂ is emitted in a number of ways, both naturally and through human activities. The largest source of CO ₂ emissions globally is the combustion of fossil fuels such as coal, oil, and gas in power plants, automobiles, industrial facilities, and other sources. A number of production processes and product uses such as mineral production, metal production, and the use of petroleum-based products can also lead to CO ₂ emissions. The atmospheric lifetime of CO ₂ is variable because it is so readily exchanged in the atmosphere. ¹
Methane (CH ₄)	Methane (CH ₄) is a colorless, odorless gas that is not flammable under most circumstances. CH ₄ is the major component of natural gas, about 87 percent by volume. It is also formed and released to the atmosphere by biological processes occurring in anaerobic environments. Methane is emitted from a variety of both human-related and natural sources. Human-related sources include fossil fuel production, animal husbandry (intestinal fermentation in livestock and manure management), biomass burning, and waste management. These activities release significant quantities of methane to the atmosphere. Natural sources of methane include wetlands, gas hydrates, permafrost, termites, oceans, freshwater bodies, non-wetland soils, and wildfires. Methane's atmospheric lifetime is about 12 years. ²
Nitrous Oxide (N ₂ O)	Nitrous oxide (N ₂ O) is a clear, colorless gas with a slightly sweet odor. N ₂ O is produced by both natural and human-related sources. Primary human-related sources of N ₂ O are agricultural soil management, animal manure management, sewage treatment, mobile and stationary combustion of fossil fuels, adipic acid production, and nitric acid production. N ₂ O is also produced naturally from a wide variety of biological sources in soil and water, particularly microbial action in wet tropical forests. The atmospheric lifetime of N ₂ O is approximately 120 years. ³
Hydrofluorocarbons (HFCs)	Hydrofluorocarbons (HFCs) are man-made chemicals, many of which have been developed as alternatives to ozone-depleting substances for industrial, commercial, and consumer products. The atmospheric lifetime for HFCs varies from just over a year for HFC-152a to 260 years for HFC-23. Most of the commercially used HFCs have atmospheric lifetimes of less than 15 years (e.g., HFC-134a, which is used in automobile air conditioning and refrigeration, has an atmospheric life of 14 years). ⁴
Perfluorocarbons (PFCs)	Perfluorocarbons (PFCs) are colorless, highly dense, chemically inert, and nontoxic. There are seven PFC gases: perfluoromethane (CF ₄), perfluoroethane (C ₂ F ₆), perfluoropropane (C ₃ F ₈), perfluorobutane (C ₄ F ₁₀), perfluorocyclobutane (C ₄ F ₈), perfluoropentane (C ₅ F ₁₂), and perfluorohexane (C ₆ F ₁₄). The largest current source of PFCs is aluminum production, which releases CF ₄ and C ₂ F ₆ as byproducts. The estimated atmospheric lifetimes for CF ₄ and C ₂ F ₆ are 50,000 and 10,000 years, respectively. ^{4,5}
Sulfur Hexafluoride (SF ₆)	Sulfur hexafluoride (SF ₆) is an inorganic compound that is colorless, odorless, nontoxic, and generally nonflammable. SF ₆ is primarily used as an electrical insulator in high voltage equipment. The electric power industry uses roughly 80 percent of all SF ₆ produced worldwide. Significant leaks occur from aging equipment and during equipment maintenance and servicing. SF ₆ has an atmospheric life of 3,200 years. ⁴

Sources: ¹EPA 2011a, ²EPA 2011b, ³EPA 2010a, ⁴EPA 2010b, ⁵EFCTC 2003

Each GHG differs in its ability to absorb heat in the atmosphere based on the lifetime, or persistence, of the gas molecule in the atmosphere. Gases with high global-warming potential, such as HFCs, PFCs, and SF₆, are the most heat absorbent. Methane traps over 21 times more heat per molecule than CO₂, and N₂O absorbs 310 times more heat per molecule than CO₂. Often, estimates of GHG emissions are presented in carbon dioxide equivalents (CO₂e), which

weight each gas by its global warming potential (GWP). Expressing GHG emissions in carbon dioxide equivalents takes the contribution of all GHG emissions to the greenhouse effect and converts them to a single unit equivalent to the effect that would occur if only CO₂ were being emitted. **Table 4.13-2** shows the GWPs for different greenhouse gases for a 100-year time horizon.

TABLE 4.13-2
GLOBAL WARMING POTENTIAL FOR GREENHOUSE GASES

Greenhouse Gas	Global Warming Potential
Carbon Dioxide (CO ₂)	1
Methane (CH ₄)	21
Nitrous Dioxide (N ₂ O)	310
Hydrofluorocarbons (HFCs), Perfluorocarbons (PFCs)	6,500
Sulfur Hexafluoride (SF ₆)	23,900

Source: California Climate Action Registry 2009

As the name implies, global climate change is a global problem. GHGs are global pollutants, unlike criteria air pollutants and toxic air contaminants, which are pollutants of regional and local concern, respectively. California is a significant emitter of CO₂ in the world and produced 477 million gross metric tons of CO₂ equivalents in 2008 (CARB 2010). Consumption of fossil fuels in the transportation sector was the single largest source of California's GHG emissions in 2008, accounting for 36.4 percent of total GHG emissions in the state (CARB 2010). This category was followed by the electric power sector (including both in-state and out-of-state sources) (24.3 percent) and the industrial sector (19.3 percent) (CARB 2010).

EFFECTS OF GLOBAL CLIMATE CHANGE

California can draw on substantial scientific research conducted by experts at various state universities and research institutions. With more than a decade of concerted research, scientists have established that the early signs of climate change are already evident in the state—as shown, for example, in increased average temperatures, changes in temperature extremes, reduced snowpack in the Sierra Nevada, sea level rise, and ecological shifts.

Many of these changes are accelerating—locally, across the country, and around the globe. As a result of emissions already released into the atmosphere, California will face intensifying climate changes in coming decades (CNRA 2009a). Generally, research indicates that California should expect overall hotter and drier conditions with a continued reduction in winter snow (with concurrent increases in winter rains), as well as increased average temperatures and accelerating sea-level rise. In addition to changes in average temperatures, sea level, and precipitation patterns, the intensity of extreme weather events is also changing (CNRA 2009a).

Climate change temperature projections identified in the 2009 California Climate Adaptation Strategy suggest the following (CNRA 2009a):

- Average temperature increase is expected to be more pronounced in the summer than in the winter season.
- Inland areas are likely to experience more pronounced warming than coastal regions.
- Heat waves are expected to increase in frequency, with individual heat waves also showing a tendency toward becoming longer, and extending over a larger area, thus more likely to encompass multiple population centers in California at the same time.

4.13 GREENHOUSE GASES AND CLIMATE CHANGE

- As GHGs remain in the atmosphere for decades, temperature changes over the next 30 to 40 years are already largely determined by past emissions. By 2050, temperatures are projected to increase by an additional 1.8 to 5.4°F (an increase one to three times as large as that which occurred over the entire twentieth century).
- By 2100, the models project temperature increases between 3.6 and 9°F.

According to the 2009 California Climate Adaptation Strategy, the impacts of climate change in California have the potential to include, but are not limited to, the areas discussed in **Table 4.13-3**.

TABLE 4.13-3
POTENTIAL STATEWIDE IMPACTS FROM CLIMATE CHANGE

Potential Statewide Impact	Description
Public Health	Climate change is expected to lead to an increase in ambient (i.e., outdoor) average air temperature, with greater increases expected in summer than in winter months. Larger temperature increases are anticipated in inland communities as compared to the California coast. The potential health impacts from sustained and significantly higher than average temperatures include heat stroke, heat exhaustion, and the exacerbation of existing medical conditions such as cardiovascular and respiratory diseases, diabetes, nervous system disorders, emphysema, and epilepsy. Numerous studies have indicated that there are generally more deaths during periods of sustained higher temperatures, and these are due to cardiovascular causes and other chronic diseases. The elderly, infants, and socially isolated people with pre-existing illnesses who lack access to air conditioning or cooling spaces are among the most at risk during heat waves.
Floods and Droughts	The impacts of flooding can be significant. Results may include population displacement, severe psychosocial stress with resulting mental health impacts, exacerbation of pre-existing chronic conditions, and infectious disease. Additionally, impacts can range from a loss of personal belongings, and the emotional ramifications from such loss, to direct injury and/or mortality. Drinking water contamination outbreaks in the United States are associated with extreme precipitation events. Runoff from rainfall is also associated with coastal contamination that can lead to contamination of shellfish and contribute to food-borne illness. Floodwaters may contain household, industrial, and agricultural chemicals as well as sewage and animal waste. Flooding and heavy rainfall events can wash pathogens and chemicals from contaminated soils, farms, and streets into drinking water supplies. Flooding may also overload storm and wastewater systems, or flood septic systems, also leading to possible contamination of drinking water systems. Drought impacts develop more slowly over time. Risks to public health that Californians may face from drought include impacts on water supply and quality, food production (both agricultural and commercial fisheries), and risks of waterborne illness. As surface water supplies are reduced as a result of drought conditions, the amount of groundwater pumping is expected to increase to make up for the water shortfall. The increase in groundwater pumping has the potential to lower the water tables and cause land subsidence. Communities that utilize well water will be adversely affected by drops in water tables or through changes in water quality. Groundwater supplies have higher levels of total dissolved solids compared to surface waters. This introduces a set of effects for consumers, such as repair and maintenance costs associated with mineral deposits in water heaters and other plumbing fixtures, and on public water system infrastructure designed for lower salinity surface water supplies. Drought may also lead to increased concentration of contaminants in drinking water supplies.

Potential Statewide Impact	Description
Water Resources	The state's water supply system already faces challenges to provide water for California's growing population. Climate change is expected to exacerbate these challenges through increased temperatures and possible changes in precipitation patterns. The trends of the last century—especially increases in hydrologic variability—will likely intensify in this century. The state can expect to experience more frequent and larger floods and deeper droughts. Rising sea level will threaten the Delta water conveyance system and increase salinity in near-coastal groundwater supplies. Planning for and adapting to these simultaneous changes, particularly their impacts on public safety and long-term water supply reliability, will be among the most significant challenges facing water and flood managers this century.
Forests and Landscapes	Global climate change has the potential to intensify the current threat to forests and landscapes by increasing the risk of wildfire and altering the distribution and character of natural vegetation. If temperatures rise into the medium warming range, wildfire occurrence statewide could increase from 57 percent to 169 percent by 2085. However, since wildfire risk is determined by a combination of factors, including precipitation, winds, temperature, and landscape and vegetation conditions, future risks will not be uniform throughout the state.

Source: CNRA 2009a

Current Greenhouse Gas Emissions

California Emissions

The California Energy Commission (2006) estimates that California is the second-largest state emitter of GHG emissions in the United States, behind Texas in absolute emissions. However, the state has relatively low carbon intensity when considering GHG emissions per person or GHG emissions per unit gross state product. Worldwide, California is responsible for approximately 2 percent of the world's CO₂ emissions (CEC 2006). The California Air Resources Board (CARB) (2009) released estimates of California's 1990 emissions inventory, which amounted to 433.29 million gross metric tons of carbon dioxide equivalent (MMT CO₂e). CARB (2010) has also estimated that 2008 emissions levels were 477 MMT CO₂e.

City of Shasta Lake Emissions

According to the Shasta Regional Climate Action Plan Community Workshop presentation (SCAQMD 2011), the City of Shasta Lake contributed approximately 138,330 metric tons of CO₂e in 2008. While many different sources emit GHG emissions in the city, a few sources account for the vast majority of emissions. The electricity generation and natural gas combustion category is by far the largest contributor of GHG emissions in the region, accounting for 59.9 percent of the total. On-road transportation—comprising cars and trucks—was the second (36.3 percent), solid waste generation was third (2.9 percent), and water conveyance was fourth (0.6 percent) (SCAQMD 2011).

4.13.2 REGULATORY FRAMEWORK

FEDERAL REGULATION AND THE CLEAN AIR ACT

In the past, the US Environmental Protection Agency (EPA) has not regulated greenhouse gases under the Clean Air Act (CAA) because it asserted that the act did not authorize the EPA to issue mandatory regulations to address global climate change and that such regulation would

4.13 GREENHOUSE GASES AND CLIMATE CHANGE

be unwise without an unequivocally established causal link between GHGs and the increase in global surface air temperatures. However, the US Supreme Court held that the EPA must consider regulation of motor vehicle GHG emissions. In *Massachusetts v. Environmental Protection Agency et al.*, 12 states and cities, including California, together with several environmental organizations, sued to require the EPA to regulate GHGs as pollutants under the Clean Air Act (127 S. Ct. 1438 [2007]). The court ruled that GHGs fit within the Clean Air Act's definition of a pollutant and that the EPA did not have a valid rationale for not regulating GHGs. In response to this ruling, the EPA has recently made an endangerment finding that GHGs pose a threat to the public health and welfare. This is the first step necessary for the establishment of federal GHG regulations under the Clean Air Act.

In April 2010, the EPA issued the final rule on new standards for GHG emissions and fuel economy for light-duty vehicles in model years 2017–2025. In November 2010, the EPA published “PSD [Prevention of Significant Deterioration] and Title V Permitting Guidance for Greenhouse Gases,” which provides the basic information that permit writers and applicants need to address GHG emissions regulated under the Clean Air Act. In that document, the EPA described the “Tailoring Rule” in the regulation of GHG emissions. With the Tailoring Rule, the EPA established a phased schedule in the regulation of stationary sources. The first phase of the Tailoring Rule began January 2, 2011, and focuses the GHG permitting programs on the largest sources with the most Clean Air Act-permitting experience. In phase two, which began June 1, 2011, the rule expands to cover large sources of GHGs that may not have been previously covered by the Clean Air Act for other pollutants. The rule also describes the EPA's commitment to future rulemaking that will describe subsequent steps of the Tailoring Rule for GHG permitting (EPA 2010c).

FEDERAL HEAVY-DUTY NATIONAL PROGRAM

In August 2011, the EPA and the Department of Transportation's National Highway Traffic Safety Administration (NHTSA) announced the first-ever program to reduce GHG emissions and improve fuel efficiency of heavy-duty trucks and buses. The EPA and the NHTSA have each adopted complementary standards under their respective authorities covering model years 2014–2018, which together form a comprehensive Heavy-Duty National Program. The goal of the joint rulemakings is to present coordinated federal standards that help manufacturers build a single fleet of vehicles and engines that are able to comply with both agencies. The EPA and NHTSA have adopted standards for CO₂ emissions and fuel consumption, respectively, tailored to each of three main regulatory categories: (1) combination tractors; (2) heavy-duty pickup trucks and vans; and (3) vocational vehicles. The EPA has additionally adopted standards to control HFC leakage from air conditioning systems in pickups and vans and combination tractors. Also exclusive to the EPA program are the EPA's N₂O and CH₄ standards that will apply to all heavy-duty engines, pickups, and vans. For purposes of this program, the heavy-duty fleet incorporates all on-road vehicles rated at a gross vehicle weight at or above 8,500 pounds, and the engines that power them, except those covered by the current GHG emissions and Corporate Average Fuel Economy standards for model year 2012–2016 passenger vehicles.

The Heavy-Duty National Program is projected to reduce fuel use and GHG emissions from medium- and heavy-duty vehicles, from semi-trucks to the largest pickup trucks and vans, as well as all types and sizes of work trucks and buses in between. Vehicles covered by this program make up the transportation segment's second largest contributor to oil consumption and GHG emissions. This comprehensive program is designed to address the urgent and closely intertwined challenges of dependence on oil, energy security, and global climate change. The EPA and the NHTSA estimate that the combined standards will reduce CO₂ emissions by about 270 million metric tons and save about 530 million barrels of oil over the life of vehicles built for the 2014 to 2018 model years, providing \$49 billion in net program benefits. A second phase of regulations is

planned for model years beyond 2018. The goals would include spurring innovation as well as updating the assessment of actual emissions and fuel use from this sector. Such future regulation would also be designed to align with similar programs developed outside the United States.

STATE

Assembly Bill 1493

Assembly Bill (AB) 1493 (Pavley) of 2002 (Health and Safety Code Sections 42823 and 43018.5) requires the California Air Resources Board to develop and adopt the nation's first GHG emission standards, also known as Pavley 1, for automobiles. The California Legislature declared in AB 1493 that global warming is a matter of increasing concern for public health and the environment. It cites several risks that California faces from climate change, including a reduction in the state's water supply, an increase in air pollution caused by higher temperatures, harm to agriculture, an increase in wildfires, damage to the coastline, and economic losses caused by higher food, water, energy, and insurance prices. The bill also states that technological solutions to reduce GHG emissions would stimulate California's economy and provide jobs. In 2004, the State of California submitted a request for a waiver from federal clean air regulations, as the State is authorized to do under the CAA, to allow the state to require reduced tailpipe emissions of CO₂. In late 2007, the EPA denied California's waiver request and declined to promulgate adequate federal regulations limiting GHG emissions. In early 2008, the state brought suit against the EPA related to this denial.

In January 2009, President Obama instructed the EPA to reconsider the Bush Administration's denial of California's and 13 other states' requests to implement global warming pollution standards for cars and trucks. In June 2009, the EPA granted California's waiver request, enabling the state to enforce its GHG emissions standards for new motor vehicles beginning with the current model year.

Also in 2009, President Obama announced a national policy aimed at both increasing fuel economy and reducing GHG pollution for all new cars and trucks sold in the United States. The new standards would cover model years 2012 to 2016 and would raise passenger vehicle fuel economy to a fleet average of 35.5 miles per gallon (mpg) by 2016. When the national program takes effect, California has committed to allowing automakers showing compliance with the national program to also be deemed in compliance with state requirements. California is committed to further strengthening these standards, requiring a 45 percent GHG reduction from the 2020 model year vehicles.

Executive Order S-3-05

Executive Order S-3-05 (State of California) proclaims that California is vulnerable to the impacts of climate change. It declares that increased temperatures could reduce the Sierra's snowpack, further exacerbate California's air quality problems, and potentially cause a rise in sea levels. To combat those concerns, the Executive Order established total GHG emission targets. Specifically, emissions are to be reduced to the 2000 level by 2010, to the 1990 level by 2020, and to 80 percent below the 1990 level by 2050.

The Executive Order directed the secretary of the California Environmental Protection Agency (CalEPA) to coordinate a multiagency effort to reduce GHG emissions to the target levels. The secretary will also submit biannual reports to the governor and state legislature describing (1) progress made toward reaching the emission targets, (2) impacts of global warming on California's resources, and (3) mitigation and adaptation plans to combat these impacts. To

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comply with the Executive Order, the secretary of CalEPA created a Climate Action Team made up of members from various state agencies and commissions. The Climate Action Team released its first report in March 2006 and continues to release periodic reports on progress. The report proposed to achieve the targets by building on voluntary actions of California businesses, local government and community actions, as well as through state incentive and regulatory programs.

Assembly Bill 32, the California Global Warming Solutions Act of 2006

The California Global Warming Solutions Act of 2006 (AB 32) 32 (Health and Safety Code Sections 38500, 38501, 28510, 38530, 38550, 38560, 38561–38565, 38570, 38571, 38574, 38580, 38590, 38592–38599) was signed into law in September 2006 after considerable study and expert testimony before the legislature. The law instructs CARB to develop and enforce regulations for the reporting and verifying of statewide GHG emissions. The act directed CARB to set a GHG emissions limit based on 1990 levels, to be achieved by 2020. The bill set a timeline for adopting a scoping plan for achieving GHG reductions in a technologically and economically feasible manner.

The heart of the bill is the requirement that statewide GHG emissions be reduced to 1990 levels by 2020. Based on CARB's calculation of 1990 baseline emissions levels, California must reduce GHG emissions by approximately 29 percent below "business-as-usual" predictions of year 2020 GHG emissions to achieve this goal.

The bill required CARB to adopt rules and regulations in an open public process to achieve the maximum technologically feasible and cost-effective GHG reductions. CARB accomplished the key milestones set forth in AB 32, including the following:

- June 30, 2007. Identification of discrete early action GHG emissions reduction measures. On June 21, 2007, CARB satisfied this requirement by approving three early action measures. These were later supplemented by adding six other discrete early action measures.
- January 1, 2008. Identification of the 1990 baseline GHG emissions level, approval of a statewide limit equivalent to that level, and adoption of reporting and verification requirements concerning GHG emissions. On December 6, 2007, CARB approved a statewide limit on GHG emissions levels for the year 2020 consistent with the determined 1990 baseline.
- January 1, 2009. Adoption of a scoping plan for achieving GHG emission reductions. On December 11, 2008, CARB adopted the Climate Change Scoping Plan: A Framework for Change (Scoping Plan), discussed in more detail below.
- January 1, 2010. Adoption and enforcement of regulations to implement the "discrete" actions. Several early action measures have been adopted and became effective on January 1, 2010.
- January 1, 2011. Adoption of GHG emissions limits and reduction measures by regulation. On October 28, 2010, CARB released its proposed cap-and-trade regulations, which would cover sources of approximately 85 percent of California's GHG emissions (CARB 2010). CARB's board ordered CARB's executive director to prepare a final regulatory package for cap and trade on December 16, 2010.
- January 1, 2012. GHG emissions limits and reduction measures adopted in 2011 become enforceable.

AB 32 Scoping Plan

As noted above, on December 11, 2008, CARB adopted the Scoping Plan to achieve the goals of AB 32. The Scoping Plan establishes an overall framework for the measures that will be adopted to reduce California's GHG emissions. CARB determined that achieving the 1990 emission level would require a reduction of GHG emissions of approximately 29 percent below what would otherwise occur in 2020 in the absence of new laws and regulations (referred to as "business as usual"). The Scoping Plan evaluates opportunities for sector-specific reductions, integrates all CARB and Climate Action Team early actions and additional GHG reduction measures by both entities, identifies additional measures to be pursued as regulations, and outlines the role of a cap-and-trade program. Additional development of these measures and adoption of the appropriate regulations will occur through the end of year 2013. The key elements of the Scoping Plan include:

- Expanding and strengthening existing energy efficiency programs as well as building and appliance standards.
- Achieving a statewide renewables energy mix of 33 percent.
- Developing a California cap-and-trade program that links with other Western Climate Initiative partner programs to create a regional market system and caps sources contributing 85 percent of California's GHG emissions.
- Establishing targets for transportation-related GHG emissions for regions throughout California, and pursuing policies and incentives to achieve those targets.
- Adopting and implementing measures pursuant to existing state laws and policies, including California's clean car standards, heavy-duty truck measures, and the Low Carbon Fuel Standard.
- Creating targeted fees, including a public goods charge on water use, fees on high global warming potential gases, and a fee to fund the administrative costs of the State of California's long-term commitment to AB 32 implementation.

In 2009, a coalition of special interest groups brought a challenge to the Scoping Plan alleging that it violated AB 32 and that the environmental review document (called a "Functional Equivalent Document") violated the California Environmental Quality Act (CEQA) by failing to appropriately analyze alternatives to the proposed cap-and-trade program. On May 20, 2011, the San Francisco Superior Court entered a final judgment ordering that CARB take no further action with respect to cap-and-trade rulemaking until it complies with CEQA. While CARB disagrees with the trial court finding and appealed the decision on May 23, 2011, in order to remove any doubt about the matter and in keeping with CARB's interest in public participation and informed decision-making, CARB revisited the alternatives. The revised analysis includes the five alternatives included in the original environmental analysis: a "no project" alternative (that is, taking no action at all); a plan relying on a cap-and-trade program for the sectors included in a cap; a plan relying more on source-specific regulatory requirements with no cap-and-trade component; a plan relying on a carbon fee or tax; and a plan relying on a variety of proposed strategies and measures. The public hearing to consider approval of the AB 32 Scoping Plan Functional Equivalent Document and the AB 32 Scoping Plan was held on August 24, 2011. On this date, CARB re-approved the Scoping Plan.

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In August 2012, CARB released revised estimates of the expected 2020 emissions reductions. The revised analysis relies on emissions projections updated in light of current economic forecasts which account for the economic downturn since 2008 as well as reduction measures already approved and put in place. This reduced the projected 2020 emissions from 596 million metric tons (MMT) CO₂e to 545 MMTCO₂e. The reduction in projected 2020 emissions means that the revised business-as-usual (BAU) reduction necessary to achieve AB 32's goal of reaching 1990 levels by 2020 is now only 21 percent.

Senate Bill 1368

Senate Bill (SB) 1368 (codified at Public Utilities Code Chapter 3) is the companion bill of AB 32. SB 1368 required the California Public Utilities Commission (CPUC) to establish a GHG emissions performance standard for baseload generation from investor-owned utilities by February 1, 2007. The bill also required the California Energy Commission (CEC) to establish a similar standard for local publicly owned utilities by June 30, 2007. These standards cannot exceed the GHG emission rate from a baseload combined-cycle natural-gas-fired plant. The legislation further requires that all electricity provided to California, including imported electricity, must be generated from plants that meet the standards set by the CPUC and CEC.

Senate Bill 1078, Governor's Order S-14-08, and Senate Bill 2X (California Renewables Portfolio Standards)

SB 1078 (Public Utilities Code Sections 387, 390.1, 399.25 and Article 16) addresses electricity supply and requires that retail sellers of electricity, including investor-owned utilities and community choice aggregators, provide a minimum 20 percent of their supply from renewable sources by 2017. This bill will affect statewide GHG emissions associated with electricity generation. In 2008, Governor Schwarzenegger signed Executive Order S-14-08, which set the Renewables Portfolio Standards target to 33 percent by 2020. It directed state government agencies and retail sellers of electricity to take all appropriate actions to implement this target.

Prior to the Executive Order, the CPUC and the CEC were responsible for implementing and overseeing the Renewables Portfolio Standards. The Executive Order shifted that responsibility to CARB, requiring them to adopt regulations by July 31, 2010. CARB is required by current law, AB 32 of 2006, to regulate sources of GHGs to meet a state goal of reducing GHG emissions to 1990 levels by 2020 and an 80 percent reduction of 1990 levels by 2050.

In March 2011, SB 2X established S-14-08 as law passed the state's legislature. While SB 2X contains the same targets as Governor's Order S-14-08 (33 percent of their supply from renewable sources by 2020), as an executive order it did not have the force of law (Governor's Order can be reversed by future governors).

Senate Bill 375

SB 375 (codified at Government Code and Public Resources Code¹), signed in September 2008, aligns regional transportation planning efforts, regional GHG reduction targets, and land use and housing allocation. SB 375 requires metropolitan planning organizations (MPOs) to adopt a Sustainable Communities Strategy or Alternative Planning Strategy, which will prescribe land use allocation in that MPO's Regional Transportation Plan. CARB, in consultation with MPOs, will

¹ Senate Bill 375 is codified at Government Code Sections 65080, 65400, 65583, 65584.01, 65584.02, 65584.04, 65587, 65588, 14522.1, 14522.2, and 65080.01 as well as Public Resources Code Sections 21061.3, 21159.28, and Chapter 4.2.

provide each affected region with reduction targets for GHGs emitted by passenger cars and light trucks in the region for the years 2020 and 2035. These reduction targets will be updated every eight years, but can be updated every four years if advancements in emissions technologies affect the reduction strategies to achieve the targets. CARB is also charged with reviewing each MPO's Sustainable Communities Strategy or Alternative Planning Strategy for consistency with its assigned targets. If MPOs do not meet the greenhouse gas reduction targets, transportation projects would not be eligible for funding programmed after January 1, 2012.

California Building Energy Efficiency Standards

Title 24, Part 6 of the California Code of Regulations, known as the Building Energy Efficiency Standards, was established in 1978 in response to a legislative mandate to reduce California's energy consumption. The standards are updated periodically to allow consideration and possible incorporation of new energy efficiency technologies and methods. On January 1, 2010, the California Building Standards Commission adopted CALGreen, and California became the first state in the United States to adopt a statewide green building standards code. CALGreen requires new buildings to reduce water consumption by 20 percent, divert 50 percent of construction waste from landfills, and install low pollutant-emitting materials.

4.13.3 IMPACTS AND MITIGATION MEASURES

STANDARDS OF SIGNIFICANCE

Per Appendix G of the CEQA Guidelines, the City considers impacts related to climate change significant if implementation of the proposed project would result in any of the following:

- Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment.
- Conflict with any applicable plan, policy, or regulation of an agency adopted for the purpose of reducing the emissions of greenhouse gases.

To meet the GHG emissions targets of AB 32, described above, California would need to generate fewer GHG emissions in the future than current levels. It is recognized, however, that for most projects there is no simple metric available to determine if a single project would substantially increase or decrease overall GHG emission levels or conflict with the goals of AB 32. Moreover, emitting GHG emissions into the atmosphere is not itself an adverse environmental effect. It is the increased concentration of GHG emissions in the atmosphere resulting in global climate change and the associated consequences of climate change that results in adverse environmental effects (e.g., sea level rise, loss of snowpack, severe weather events). Although it is possible to generally estimate a project's incremental contribution of GHGs into the atmosphere, it is typically not possible to determine whether or how an individual project's relatively small incremental contribution might translate into physical effects on the environment. Given the complex interactions between various global and regional-scale physical, chemical, atmospheric, terrestrial, and aquatic systems that result in the physical expressions of global climate change, it is impossible to discern whether the presence or absence of GHGs emitted as a result of the proposed project would result in any altered conditions.

However, the State of California has established GHG reduction targets and has determined that GHG emissions as they relate to global climate change are a source of adverse environmental impacts in California that should be addressed under CEQA. Although AB 32 did not amend CEQA, it identifies the myriad environmental problems in California caused by global

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warming (Health and Safety Code Section 38501[a]). In response to the relative lack of guidance on addressing GHGs and climate change, SB 97 was passed in order to amend CEQA by directing the Office of Planning and Research (OPR) to prepare revisions to the CEQA Guidelines addressing the mitigation of GHGs or their consequences. These revisions to the CEQA Guidelines went into effect in January 2010.

Thresholds of significance illustrate the extent of an impact and are a basis from which to apply mitigation measures. Currently, neither the CEQA statutes, the Office of Planning and Research (OPR) guidelines, nor the State CEQA Guidelines prescribe specific quantitative thresholds of significance or a particular methodology for performing an impact analysis. Significance criteria are left to the judgment and discretion of the lead agency, in this case the City of Shasta Lake.

Per the recommendation of the Shasta County Air Quality Management District (SCAQMD), this EIR identifies and quantifies the GHG emissions of the proposed project. As previously stated, on December 11, 2008, CARB adopted the Scoping Plan to achieve the goals of AB 32, which determined that achieving the 1990 emission level would require a reduction of GHG emissions of approximately 29 percent below what would otherwise occur in 2020 in the absence of new laws and regulations (referred to as “business as usual” or BAU).² However, in August 2012, CARB released revised estimates of the expected 2020 emissions reductions which were updated to account for the economic downturn since 2008 as well as reduction measures already approved and put in place. This reduced the projected 2020 emissions and thereby revised the business-as-usual (BAU) reduction necessary to achieve AB 32’s goal of reaching 1990 levels by 2020 to only 21 percent.

For the purposes of evaluating the proposed project’s GHG contribution, buildout of the proposed project is compared to the achievement of at least a 21 percent reduction in GHG emissions by project buildout as compared to business as usual. The SCAQMD has determined that this reduction is consistent with the GHG emissions reduction targets established in the California Air Resources Board’s AB 32 Scoping Plan. In addition, this EIR assesses the project’s potential to conflict with an applicable GHG-reducing regulation by determining the project’s consistency with specific strategies identified in the AB 32 Scoping Plan for reducing GHG emissions. As stated previously, the AB 32 Scoping Plan contains the main strategies California is implementing to achieve reduction of 21 percent from the state’s projected 2020 emission level of 545 MMT of CO₂e under a business-as-usual scenario. The AB 32 Scoping Plan also includes CARB-recommended GHG reductions for each emissions sector of the state’s GHG inventory.

METHODOLOGY

GHG emissions contribute, on a cumulative basis, to the significant adverse environmental impacts of global climate change. No single project could generate enough GHG emissions to noticeably change the global average temperature. The CEQA Checklist asks, “Will the project generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?” This inquiry addresses both the project’s individual and cumulative projects. However, CEQA only requires consideration of impacts that are “reasonably foreseeable” and does not require speculation as to effects that cannot be reasonably predicted (CEQA Guidelines Section 15358). As the SB 97 CEQA Amendments make clear, the

² Business as usual (BAU) is the project’s projected GHG emissions level in 2020 under the assumption that consumption patterns and efficiencies are maintained at their 2005 levels. Under a BAU scenario, state, regional, and project-level efforts to reduce GHG emissions are not taken into consideration; rather, the BAU assumes the Year 2005 status quo.

significance of greenhouse gas emissions is most appropriately considered on a cumulative level. CEQA Guidelines Section 15130(f) states, “An EIR shall analyze greenhouse gas emissions resulting from a proposed project when the incremental contribution of these emissions may be cumulatively considerable.” Among other things, the California Natural Resources Agency (CNRA) (2009b) noted in its public notice for the CEQA GHG Amendments that impacts of GHG emissions should focus on the cumulative impact on climate change). The public notice states:

While the Proposed Amendments do not foreclose the possibility that a single project may result in greenhouse gas emissions with a direct impact on the environment, the evidence before [CNRA] indicates that in most cases, the impact will be cumulative. Therefore, the Proposed Amendments emphasize that the analysis of greenhouse gas emissions should center on whether a project's incremental contribution of greenhouse gas emissions is cumulatively considerable.

Thus, the CEQA Amendments continue to make clear that the significance of greenhouse gas emissions is most appropriately considered on a cumulative level. Therefore, the combination of GHG emissions from past, present, and future projects contributes substantially to the phenomenon of global climate change and its associated environmental impacts and as such is addressed only as a cumulative impact.

The resultant GHG emissions of the proposed project were calculated using the California Emissions Estimator Model (CalEEMod), version 2013.2.1, computer program (see **Appendix 4.13-1**). CalEEMod is a statewide land use emissions computer model designed to provide a uniform platform for the use of government agencies, land use planners, and environmental professionals. This model was developed in coordination with the South Coast Air Quality Management District and is the most current emissions model approved for use in California by various other air districts.

IMPACTS AND MITIGATION MEASURES

Generate GHG Emissions That May Have a Significant Impact on the Environment (Standard of Significance 1)

Impact 4.13.1 Implementation of the proposed project would result in a net increase in GHG emissions, yet would not result in a significant impact on the environment. This impact is **less than cumulatively considerable**.

Construction GHG Emissions

Subsequent development proposed under the proposed project would result in direct emissions of GHGs from construction. The approximate quantity of daily GHG emissions generated by construction equipment utilized to build the proposed project is depicted in **Table 4.13-4**.

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TABLE 4.13-4
CONSTRUCTION-RELATED GREENHOUSE GAS EMISSIONS – TOTAL METRIC TONS PER “AREA”

Project Phase	Maximum Emissions (Total Metric Tons)			
	Carbon Dioxide (CO ₂)	Methane (CH ₄)	Nitrous Oxide (N ₂ O)	Carbon Dioxide Equivalent (CO ₂ e)
Phase I				
Off-Site Water Storage (20,000 square feet)	123	0	0	123
Area C – 7.3-acre park	72	0	0	72
Area D – 176 medium density residential units on 27.9 acres	1,072	0.2	0	1,077
Area E – 142 medium density residential units on 22.5 acres	817	0.1	0	820
Area F – 30 very low density residential units on 16.3 acres	528	0.1	0	531
Area G – 392 medium density residential units on 43.5 acres	2,388	0.4	0	2,396
Area H – 73,606 square feet of mixed-use commercial, 215 high density residential units, and fire station on 16.9 acres	1,442	0.2	0	1,447
Phase II				
Area A – 121,968 square feet of commercial on 11.2 acres	618	0.1	0	621
Area I – 46 medium density residential units on 7.3 acres	400	0.1	0	402
Area J – 51 medium density residential units on 8.1 acres	404	0.1	0	406
Area K – 7.6-acre park	72	0	0	72
Area L – 61 low density residential units on 17.1 acres	555	0.1	0	557
Area O – 47 low density residential units on 13.1 acres	542	0.1	0	545
Phase II				
Off-Site Road Extension – project site to Shasta Dam Boulevard	12	0	0	12
Area M – 70 low density residential units on 19.4 acres and 13-acre park	1,892	0.3	0	1,897
Area N – 41 low density residential units on 11.3 acres	536	0.1	0	539
Area P – 119 low density residential units on 32.9 acres	988	0.2	0	993
Area Q – 19 very low density residential units on 12.4 acres	552	0.1	0	555
Area R – 122 high density residential units on 4.5 acres	560	0.1	0	562
Area S – 73 very low density residential units on 40.5 acres	1,391	0.3	0	1,398
Total	14,964	2.6	0	15,025

Source: CalEEMod output is included as **Appendix 4.13-1**.

Table 4.13-4 illustrates the construction-related GHG emissions that would result from construction of the proposed project. As shown, construction of the proposed project would result in the generation of approximately 15,025 metric tons of CO₂e over the course of construction, which is projected to last 10 to 20 years. Once construction is complete, the generation of these GHG emissions would cease.

Operational GHG Emissions

For the purpose of analyzing this land use development project, the threshold of significance for operational-related GHG emissions is represented as the achievement of at least a 21 percent reduction in GHG emissions as compared to business as usual, as described above. In order to ascertain the achievement of a 21 percent reduction compared to BAU, quantification of project-specific GHG emissions is required. Projects demonstrated to have reduced or mitigated project-specific GHG emissions by at least 21 percent compared to BAU, consistent with GHG emissions reduction targets established in the California Air Resources Board's AB 32 Scoping Plan, would be determined to have a less than significant individual and cumulative impact on global climate change. To be conservative, total construction-generated GHG emissions were amortized over the estimated life of the project as well as the estimated duration of construction and included with operational emissions for comparison to the significance thresholds. A project life of 30 years was assumed for the proposed project, and the duration of construction is assumed to last 20 years.

As shown in **Table 4.13-5**, the long-term operations of the project at buildout could produce 42,201 metric tons of CO₂e annually under BAU conditions, primarily from motor vehicles that travel to and from the site. This would contribute to a net increase in GHGs from the proposed project.

TABLE 4.13-5
OPERATIONAL GREENHOUSE GAS EMISSIONS UNDER BAU OPERATIONS – METRIC TONS PER YEAR

Source	CO ₂	CH ₄	N ₂ O	CO ₂ e
Construction (amortized over 20 years of construction and 30 years of project life)	299	0.05	0.00	300
Tree Removal (amortized 30 years of project life)	686	0.00	0.00	686
Area	2,460	2	0.13	2,536
Energy	5,565	0.19	0.07	5,592
Mobile	31,896	3	0.00	31,967
Solid Waste	282	17	0.00	631
Water	367	4	0.10	489
Total	41,555	26	0.30	42,201

Source: CalEEMod output is included as **Appendix 4.13-1**. BAU –The projected emissions in 2020 of the proposed project without any greenhouse gas reduction measures; i.e., emissions presented are not adjusted for future improved CAFÉ standards (Pavley 1) and Low Carbon Fuel Standards or 2010 Title 24 (CALGreen) Standards. Mobile emissions based on trip generation rates identified in the traffic analysis prepared for the project. Energy emission intensity factors for the energy supplier for Shasta Lake are not available in CalEEMod. Emissions from energy use derived from Pacific Gas & Electric emission intensity factors. Emissions resulting from tree removal include the 617 oak trees measuring at 10 inches DBH and greater that would be removed as a result of the proposed circulation plan. It is anticipated that as other areas of the Area Plan subdivide further, additional trees will be removed, though at this time the number and location of trees to be removed in the areas to be subdivided further is not known. Emissions resulting from these removals are accounted for on the basis of the "Grassland" and "Woodland" acreage CalEEMod default.

For purposes of this analysis, the total emissions of 42,201 metric tons of CO₂e per year are considered the BAU figure. Several State-led GHG emissions-reducing regulations have recently taken effect, and changes to regulations will continue to take effect in the near future that will substantially reduce GHG emissions. For instance, full implementation of AB 1493 (Pavley) will significantly reduce the amount of GHGs emitted from passenger vehicles. As passenger vehicles represent the single largest source of GHGs associated with the proposed project, the anticipated reduction represents 7,825 fewer metric tons per year of GHGs attributed to the project.

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In terms of energy, the project will at minimum meet the 2010 Title 24 energy efficiency standards, which went into effect January 1, 2011. These standards reduce electricity and natural gas usage below business as usual. The current Title 24 standards include standards to achieve a minimum 15 percent greater energy efficiency than 2005 Title 24 standards under the BAU scenario. Since the CalEEMod computer model uses energy consumption data applicable to approximately year 2005, the energy emissions rates were reduced by 15 percent to account for the increased energy efficiency standards now present in the current Title 24.

In addition, implementation of the City's Tree Conservation Ordinance will result in new trees planted to replace those lost during development. For instance, the proposed circulation plan alone would result in the removal of 617 oak trees, which equates to the need to plant 1,851 oak trees on-site per the Tree Conservation Ordinance.

Resultant GHG emissions accounting for these regulations will reduce GHGs as shown in **Table 4.13-6**.³

TABLE 4.13-6
GHG REDUCTIONS FROM APPLICATION OF RECENT REGULATIONS

California Legislation and Shasta Lake Ordinance	CO ₂ e Emissions Reductions (Metric Tons/Year)
AB 1493 (Pavley) and Low Carbon Fuel Standard ¹	7,825
2010 Title 24 (CALGreen) Standards	839
Tree Preservation Ordinance (sequestration total amortized over 20 years consistent with the Intergovernmental Panel on Climate Change (IPCC) recommendation of a 20-year active growth period)	68
Total	8,732

Source: ¹CalEEMod, PMC. Data output is included as **Appendix 4.13-1**.

It is noted that implementation of mitigation measure **MM 4.4.3b** (see Section 4.4, Air Quality, of this DEIR), which requires the implementation of SCAQMD Standard Mitigation Measures and Best Available Mitigation Measures, would reduce long-term operational emissions of greenhouse gases. However, the emissions reductions resulting from mitigation measure **MM 4.4.3b** cannot be quantified until such time that it is known which combination of specific SCAQMD Standard and Best Available mitigation measures the applicant would employ. Therefore, quantification of the emissions reduction quantification resulting from mitigation measure **MM 4.4.3b** would be speculative.

Implementation of State-led GHG reduction measures such as Pavley and Title 24 energy efficiency standards, as well as the City's Tree Conservation Ordinance, would reduce project GHG emissions 20.6 percent compared with business as usual, which is just below the 21 percent reduction threshold. In addition, implementation of the mitigation measure **MM 4.4.3a** (see Section 4.4, Air Quality) would prohibit the installation of wood-burning fireplaces in all new

³ According to the California Energy Commissions (2011), the energy supplier in Shasta Lake is projected to sell 185,000 megawatt-hours of electricity annually by the year 2020 and is not expected to be able to deliver any renewable energy annually by the year 2020. Senate Bill 2x, the Renewables Portfolio Standard program described above, specifically excludes local publicly owned electric utilities from the definition of "retail seller" (CEC 2008). Therefore, the absence of a renewable energy mix in the year 2020 does not represent a lack of compliance with the Renewables Portfolio Standard program.

residential units of subsequent development projects within the Area Plan, which would have the effect of reducing 1,329 metric tons of GHG emissions annually. Furthermore, mitigation measure **MM 4.13.2** (see Impact 4.13.2 below) would further reduce long-term operational emissions of GHG emissions generated from energy use by 347 metric tons of CO₂e annually and emissions of GHG generated from water use by 81 metric tons of CO₂e annually, for a total reduction of 428 metric tons of CO₂e. Lastly, there are a few specific project features already incorporated into the whole of the proposed Area Plan that would reduce emissions. For instance, as stated in Section 3.0, Project Description, an internal circulation system, in the form of roads and trails, would link all of the uses in the Area Plan. The trails would be located along biologically important areas, such as drainages and wetlands, and would be separated from roadways in some areas of the project site and adjacent to roadways in others. The Area Plan contains a schematic trail plan, a typical trail design section, and policies that require trail linkages for all land uses (see **Figure 3.0-4**). Policies in the Area Plan require that subsequent development connect to and extend any existing trail system. Furthermore, the proposed Area Plan contains the policy provision for transit stops on arterial roadways within the Area Plan. Lastly, the proposed Area Plan contains just under 200,000 square feet of commercial land uses in proximity to residential uses, which will reduce vehicle miles traveled and thus air pollutant emissions. These Area Plan features would reduce transportation-related GHG emissions by 7,959 metric tons annually. **Table 4.13-7** provides a summary of all project GHG reductions.

TABLE 4.13-7
SUMMARY OF PROJECT GHG REDUCTIONS

Emissions Reduction Summary	CO2 Emissions (Metric Tons/Year)
Total Business-as-Usual (BAU) Emissions	42,201
State-Led Regulatory and Shasta Ordinance Reduction	-8,732
Mitigation Measure 4.4.3a Reduction	-1,329
Mitigation Measure 4.13.2 Reduction	-428
Area Plan Reduction Features	-7,959
<i>Total GHG Emissions Reduction</i>	<i>-18,448</i>
Remaining Emissions	23,753
Percentage Reduction from Business as Usual	43.7
District Percentage Reduction Threshold for Less Than Significant Determination	21

The GHG emissions from buildout of the proposed Area Plan are projected to result in 23,753 metric tons of CO₂e per year (**Tables 4.13-5** through **4.13-7**). Because the proposed project would reduce projected BAU emissions by 43.7 percent, which is greater than the 21 percent threshold, the project is considered consistent with the State of California's ability to meet its GHG reduction goals. Thus, the proposed project's contribution to cumulative GHG emissions is considered **less than cumulatively considerable**.

Mitigation Measures

None required.

4.13 GREENHOUSE GASES AND CLIMATE CHANGE

Conflict with Assembly Bill 32 (Standard of Significance 2)

Impact 4.13.2 Implementation of the proposed project would result in a net increase in greenhouse gas emissions and could conflict with the goals of AB 32. This impact is **potentially cumulatively considerable**.

The project is considered to have a significant impact if it would be in conflict with AB 32 goals for reducing GHG emissions. In August 2011, CARB approved the AB 32 Scoping Plan outlining the state's strategy to achieve the 2020 GHG emissions limit. This Scoping Plan, developed by CARB in coordination with the Climate Action Team, proposes a comprehensive set of actions designed to reduce overall GHG emissions in California, improve the environment, reduce dependence on oil, diversify California's energy sources, save energy, create new jobs, and enhance public health. The Scoping Plan contains a list of 39 recommended actions contained in Appendices C and E of the Scoping Plan. This list is available at the following website:

http://www.arb.ca.gov/cc/scopingplan/document/appendices_volume1.pdf

The strategies included in the AB 32 Scoping Plan that apply to the project are contained in **Table 4.13-8**, which also summarizes the extent to which the proposed project would comply with the strategies to help California reach the emissions reduction targets. The strategies listed in **Table 4.13-8** are either required mitigation measures or requirements under local or state ordinances. With implementation of these strategies/measures, the project's contribution to cumulative GHG emissions would be reduced.

**TABLE 4.13-8
AB 32 COMPLIANCE**

Strategy	Project Compliance
Energy Efficiency Measures	
Energy Efficiency Maximize energy efficiency building and appliance standards, and pursue additional efficiency efforts including new technologies, and new policy and implementation mechanisms. Pursue comparable investment in energy efficiency from all retail providers of electricity in California (including both investor-owned and publicly owned utilities). Renewables Portfolio Standard Achieve a 33 percent renewable energy mix statewide. Green Building Strategy Expand the use of green building practices to reduce the carbon footprint of California's new and existing inventory of buildings.	Compliant The proposed project will comply with the updated Title 24 standards, including the new 2010 California Building Code (CBC), for building construction. These standards require new buildings to reduce water consumption by 20 percent, which results in less energy consumption for pumping water. In addition, mitigation measure MM 4.13.2 includes GHG-reducing requirements which mandate that future development in the Area Plan be designed to exceed state energy efficiency standards by 15 percent (to Tier 1 Title 24 Standards) as directed by Appendix A5 of the 2010 California Green Building Standards (CBSC 2011). This measure helps to reduce emissions associated with energy consumption.
Water Conservation and Efficiency Measures	
Water Use Efficiency Continue efficiency programs and use cleaner energy sources to move and treat water. Approximately 19 percent of all electricity, 30 percent of all natural gas, and 88 million gallons of diesel are used to convey, treat, distribute and use water and wastewater. Increasing the efficiency of water transport and reducing water use would reduce GHG emissions.	Compliant As previously described, the project would comply with Title 24 standards, which require new buildings to reduce water consumption by 20 percent. In addition, mitigation measure MM 4.13.2 includes: Indoor water conservation measures shall be incorporated, such as use of low-flow toilets, showers,

4.13 GREENHOUSE GASES AND CLIMATE CHANGE

Strategy	Project Compliance
	and faucets (kitchen and bathroom), in each residential unit. Low-water-use landscaping (i.e., drought-tolerant plants and drip irrigation) shall be installed. At least 75 percent of all landscaping plants shall be drought-tolerant as determined by a licensed landscape architect or contractor.
Transportation and Motor Vehicle Measures	
Vehicle Climate Change Standards AB 1493 (Pavley) required the State to develop and adopt regulations that achieve the maximum feasible and cost-effective reduction of GHG emissions from passenger vehicles and light-duty trucks. Regulations were adopted by CARB in September 2004. Light-Duty Vehicle Efficiency Measures Implement additional measures that could reduce light-duty GHG emissions. For example, measures to ensure that tires are properly inflated can both reduce GHG emissions and improve fuel efficiency. Adopt Heavy- and Medium-Duty Fuel and Engine Efficiency Measures Regulations to require retrofits to improve the fuel efficiency of heavy-duty trucks that could include devices that reduce aerodynamic drag and rolling resistance. This measure could also include hybridization of and increased engine efficiency of vehicles. Low Carbon Fuel Standard CARB identified this measure as a Discrete Early Action Measure. This measure would reduce the carbon intensity of California's transportation fuels by at least 10 percent by 2020.	Compliant The project does not involve the manufacture of vehicles. However, vehicles that are purchased and used within the project site would comply with any vehicle and fuel standards that CARB adopts.
Regional Transportation-Related Greenhouse Gas Targets Develop regional GHG emissions reduction targets for passenger vehicles. Local governments will play a significant role in the regional planning process to reach passenger vehicle GHG emissions reduction targets. Local governments have the ability to directly influence both the siting and design of new residential and commercial developments in a way that reduces GHGs associated with vehicle travel.	Compliant The proposed Area Plan contains mixed-use development potential that reduces the environmental impact of land use development by increasing the viability of walking, biking, and transit by placing residential land uses in close proximity to commercial services. Mixed-use strategies have well-documented benefits in terms of lower GHG emissions due to fewer and shorter vehicle trips, since residents and employees of these areas have more home, work, and shopping opportunities within walking or biking distance. Transit is also a more viable form of transportation since these developments have a larger number of potential transit users and can support more frequent transit service to regional destinations.
Measures to Reduce High Global Warming Potential (GWP) Gases CARB has identified Discrete Early Action measures to reduce GHG emissions from the refrigerants used in car air conditioners, semiconductor manufacturing, and consumer products. CARB has also identified potential reduction opportunities for future commercial and industrial refrigeration,	Compliant New products used or serviced on the project site would comply with future CARB rules and regulations.

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Strategy	Project Compliance
changing the refrigerants used in auto air conditioning systems, and ensuring that existing car air conditioning systems do not leak.	
Forests	
Urban Forestry A statewide goal of planting 5 million trees in urban areas by 2020 would be achieved through the expansion of local urban forestry programs.	Compliant Development of the proposed Area Plan would result in new tree planting. As stated in Section 4.12, Aesthetics/Visual Resources/Light and Glare, development applicants would be required to submit a landscaping plan that consists of vegetation and features characteristic of the area, which includes oak trees and other native trees, and all landscaping has to be installed prior to completion of the project.
Recycling and Waste Management	
High Recycling/Zero Waste Achieve 50 percent statewide Recycling Goal: Achieving the state's 50 percent waste diversion mandate as established by the Integrated Waste Management Act of 1989, (AB 939, Sher, Chapter 1095, Statutes of 1989), will reduce climate change emissions associated with energy intensive material extraction and production as well as methane emission from landfills. A diversion rate of 48 percent has been achieved on a statewide basis. Therefore, a 2 percent additional reduction is needed.	Compliant All future development associated with the maximum development potential of the Area Plan would be required to divert 50 percent of all solid waste from landfill facilities.

The following mitigation would be required of all future development within the Area Plan in order to conform to the GHG reduction strategies of the Scoping Plan.

Mitigation Measures

MM 4.13.2 Subsequent development projects within the Mountain Gate at Shasta Area Plan shall submit to the Shasta County Air Quality Management District and receive approval for a GHG Emissions Reduction Plan prior to issuance of building permits for the development project in question. The GHG Emissions Reduction Plan shall demonstrate adherence to the following measures or to alternative measures with the same or greater emissions reduction values:

- Indoor water conservation measures shall be incorporated, such as use of low-flow toilets, showers, and faucets (kitchen and bathroom), in each residential unit. (74 metric ton reduction)
- The proposed project shall be designed to exceed state energy efficiency standards by 15 percent (to Tier 1 Title 24 Standards) as directed by Appendix A5 of the 2010 California Green Building Standards (CBSC 2011). This measure helps to reduce emissions associated with energy consumption. (347 metric ton reduction)
- Low-water-use landscaping (i.e., drought-tolerant plants and drip irrigation) shall be installed. At least 75 percent of all landscaping plants shall be drought-tolerant as determined by a licensed landscape architect or contractor. (7 metric ton reduction)

- The installation of wood-burning fireplaces shall be prohibited in all new residential units. (1,329 metric ton reduction; required per mitigation measure **MM 4.4.3a** in Section 4.4)

Timing/Implementation: *Implemented prior to and during construction activities*

Enforcement/Monitoring: *City of Shasta Lake Development Services Department; Shasta County Air Quality Management District*

Furthermore, it is important to note that implementation of mitigation measure **MM 4.4.3b** (see Section 4.4 of this DEIR) requiring the implementation of SCAQMD Standard Mitigation Measures and Best Available Mitigation Measures would reduce long-term operational emissions of GHG. While mitigation measure **MM 4.4.3b** would substantially reduce operational emissions, the emissions reduction value of this mitigation cannot be quantified due to the programmatic nature of the proposed project and the potential variability of future development allowed in the Area Plan. Also, as previously stated, a few specific project features already incorporated into the whole of the proposed Area Plan would reduce transportation-related GHG emissions by 7,959 metric tons annually. All future development associated with the proposed Area Plan would be subject to all applicable California state regulatory requirements, which would also reduce GHG emissions.

As shown in **Table 4.13-8**, future development would comply with the strategies to help California reach the emissions reduction targets. This impact is therefore **less than cumulatively considerable**.

4.13 GREENHOUSE GASES AND CLIMATE CHANGE

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5.0 ALTERNATIVES

This section describes alternatives to the project that were considered during preparation of the DEIR.

5.1 INTRODUCTION

GENERAL CEQA REQUIREMENTS

Pursuant to CEQA Guidelines Section 15126.6(a), the purpose of the DEIR alternatives analysis is to describe a range of reasonable alternatives to the project that could feasibly:

- Attain most of the basic objectives of the project but avoid or substantially lessen any of the significant effects of the project, including alternatives that may be more costly or could otherwise impede the project objectives.
- Evaluate the comparative merits of the alternatives.

The DEIR need not consider every conceivable alternative, but rather consider a “reasonable range” of potentially feasible alternatives that will foster informed decision-making and public participation (CEQA Guidelines, Section 15126.6[c]).

CEQA Guidelines Section 15126.6(d) specifies that sufficient information about each alternative shall be provided in the DEIR to allow meaningful evaluation, analysis, and comparison with the proposed project. A description of each alternative is included in this section.

The environmental effects associated with each alternative are compared with those resulting from implementation of the proposed project and are summarized at the end of this section in **Table 5.0-5**. This section also identifies an “environmentally superior” alternative. The alternatives analyzed in this report were chosen based on their ability to minimize the anticipated environmental effects of the proposed project.

ALTERNATIVES ANALYZED IN THE DEIR

Significant environmental impacts were identified in the DEIR in the areas of traffic, noise, air quality, greenhouse gases, geology and soils, hydrology and water quality, biology, cultural resources, aesthetics, public services, and wildland fire hazards. A range of reasonable alternatives to the project were identified that would feasibly attain most of the basic objectives of the project while avoiding or substantially lessening the significant environmental effects identified in the DEIR.

The following alternatives to the proposed project have been analyzed in this DEIR:

Alternative 1 – No Project. CEQA Guidelines Section 15126.6(e)(3) requires a discussion of the “no project” alternative, which would usually proceed along one of two lines:

- When the project is the revision of an existing land use or regulatory plan policy or ongoing operation, the no project alternative will be the continuation of the existing plan, policy, or operation in the future.
- If the project is other than a land use or regulatory plan, the no project alternative is the circumstance under which the project does not proceed.

5.0 ALTERNATIVES

Under the no project alternative, development of the project site would not occur as proposed in the Area Plan. Because the City of Shasta Lake General Plan requires an Area Plan for development, another Area Plan would be required before development could occur. As with the proposed project, any Area Plan for the property would require its own environmental analysis. Approximately 118 acres of the site is designated Urban Residential High and Suburban Residential, which could develop without an Area Plan.

Alternative 2 – Black Canyon Road Connection. During the NOP comment period and scoping meeting, several residents along Black Canyon Road expressed concern about connection of the project to this roadway. They were concerned about traffic and noise on a roadway that is in poor condition. The proposed project would allow only pedestrian and emergency vehicle access and does not consider vehicle access as part of the traffic analysis. From a planning perspective, additional vehicle access would help integrate this project into the existing community. This alternative would also reduce impacts at the newly proposed Cascade Boulevard intersection at the southerly boundary of the site.

Alternative 3 – Reduced Wetland and Oak Tree Impact Alternative. This alternative would reduce the development footprint of the proposed project to avoid the jurisdictional wetlands and reduce impacts to oak trees within the project boundaries. This alternative would not allow residential development in several of the development areas. As the commercial and nonresidential areas of the proposed project are located in areas that would not affect waters of the United States or oak trees, the alternative would allow for the same amount of nonresidential development as the proposed project. Overall, this alternative results in less area available for residential development and results in fewer potential residential units.

ALTERNATIVES ELIMINATED FROM FURTHER CONSIDERATION

The alternatives discussed below were identified but eliminated from further review based on CEQA Guidelines Section 15126.6(c), which states, “The EIR should also identify any alternatives that were considered...but rejected as infeasible during the scoping process...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.”

Existing General Plan Buildout

This alternative would consider the development of the portions of the project area that have land use designations suitable for development without adoption of an Area Plan. As shown in **Table 5.0-1**, the existing General Plan designations could result in approximately 444 new dwelling units for a population of 1,145. The area currently designated Mixed Use could not be developed without a General Plan amendment.

**TABLE 5.0-1
DEVELOPMENT POTENTIAL WITHOUT AN AREA PLAN**

Current General Plan Potential				Proposed Area Plan		Difference	
Net Acreage	Existing Land Use Designation	Housing Unit Potential	Population Potential*	Proposed Units (Probable Maximum)	Population Potential*	Units	Population
118	Suburban Residential (3 dwelling units/acre)	354	913	252	650	-102	-263
23 (4.5 usable)	Urban Residential High (20 dwelling units/acre)	90	232	122	315	338	904
449	Mixed Use	0	0	1,230	3,173	1,230	3,173

* The population potential is based on an average household size of 2.58 pursuant to Department of Finance, E-5 City/County Population and Housing Estimates 1/1/2013.

Not adopting an Area Plan would result in less development within the project area than the proposed project, but would not further the goals of the City in providing a mix of residential and commercial land use in this area of the city.

Development under the current General Plan also would require an extension of Wonderland Boulevard to Cascade Boulevard as required with the proposed project. The roadway would be designed for future buildout and would result in the same impacts as those of the proposed project.

Off-Site Alternative Within the City of Shasta Lake

This alternative considers that the land uses planned in the project would be achieved elsewhere in the city, without development of the proposed project. There are no other sites of similar size that could be developed as put forth in the proposed Area Plan. **Table 5.0-2** shows properties within the city that could possibly accommodate a mixed-use development, but at a much smaller scale than the proposed project.

5.0 ALTERNATIVES

**TABLE 5.0-2
ALTERNATIVE SITES WITHIN THE CITY**

Property Description	Acres	General Plan Designation	Comments
North side of Pine Grove Avenue, west of Cascade Boulevard; east of Ashby Road	171	Suburban Residential; Light Industrial	Mixed-use development proposed in 2011 (Heritage Grove): 291 acres single-family residential and 10.7 acres neighborhood commercial. Application withdrawn.
East of Interstate 5, south of Akrich Street, north of the southeasterly city limit	80	Suburban Residential	Single-family residential subdivision proposed in 2007 for 220 homes (Brookridge Subdivision). Application withdrawn.
Riddle Road, west of Cascade Boulevard	8.2	Urban Residential High	Planned development proposed in 2006 for 101 townhouses (Tuscan Cascades). Application withdrawn.
South side of Shasta Dam Boulevard, south of Poplar Street, north of the Union Pacific Railroad	75	Urban Residential	Planned Development proposed in 2006 for development of 283 condominiums (Lasata). Application withdrawn.
East side of Interstate 5, north of Akrich Street, west of easterly city limit	149	Mixed Use; Rural Residential	No previous development proposals have been submitted to the City for this property (Washington property). Development of this property is constrained by Moody Creek, which runs through the easterly portion of the property, topography, and major street improvements that would be required for access to the site. Development potential, based on site constraints and current General Plan designation, is estimated at 300–500 dwelling units, depending on maximum density.

If the properties listed in **Table 5.0-2** were to develop with a project similar to that proposed, but at a much smaller scale, the extension of services, traffic, and related impacts would be similar to those of the proposed project. In addition to the lack of existing infrastructure, all of the sites listed in the table include similar development constraints such as floodplain, drainage, and topography.

In addition, alternative locations for this project are considered infeasible due to the absence of other similar land holdings owned by the applicant (CEQA Guidelines Section 15126.6[f][1]). Alternative site evaluations are most relevant for projects carried out by public agencies and other entities that hold large tracts of land in many locations, where there is a considerable choice in location. A power plant or highway alignment, for example, may be located in different areas, located on public land, and achieve the same objectives. The project applicant for the Mountain Gate at Shasta Area Plan project does not have this same flexibility.

Lastly, alternative sites in the city are not of sufficient size to meet most of the basic objectives of the project. For these reasons, an off-site alternative was eliminated from further review.

Off-Site Alternative Outside of the City of Shasta Lake

The alternatives discussion of the Clean Water Act Section 404 permit application includes two off-site alternatives. Both sites are located partially in Shasta County and partially in Redding. The first site is Gore Ranch, a 1,400-acre site primarily within Shasta County, with a small portion of the

eastern area of the site in Redding. The site is designated by the County as rural residential and suburban development and by the City of Redding as public facilities and greenway.

The second site is Ross Ponds, a 780-acre site located north of Shasta College in Shasta County zoned exclusive agricultural-agricultural preserve, interim rural residential allowing mobile homes, interim rural residential, rural residential minimum building area 5 acres allowing mobile homes, rural residential, planned development, open space, and designed floodway. As the City of Shasta Lake does not have the ability to carry out projects on these properties, and they are too far from the city to consider for annexation, they were eliminated from further review.

Increased Commercial

This option considers additional commercial development within the project.

Jobs-Housing Balance

During the Notice of Preparation comment period, a comment was made regarding the proposed project's impact on the City of Shasta Lake's jobs-housing balance, which is a planning concept defined as the provision of equal housing and employment opportunities in an area. The concept suggests that providing jobs locally will reduce worker commute trips and overall vehicle miles traveled (VMT). This could result in a reduction in traffic congestion, reduced travel time, lower personal transportation costs, reduced emissions, better air quality, and slow increases in housing costs (American Planning Association 2003).

In considering a jobs-housing balance, other factors to consider are the types of jobs to be created and the skill level of individuals working in the community. If they do not match, workers will have to travel out of the area to work. Another factor to consider is whether the local jobs provide a salary sufficient to be able to afford housing near the jobs. Also, there is no means of ensuring that the jobs provided near the housing will be granted to local residents. In reality, there is little a city can do to compel residents of an area to work and live in the area near the jobs.

The main concern with employment commute trips is the impact to the transportation system during peak hours, which is the main cause of congestion. The AM peak hour is defined as the peak one hour of traffic flow between 7:00 AM and 9:00 AM, while the PM peak hour is defined as the peak one hour of traffic flow between 4:00 PM and 6:00 PM, both on a typical weekday.

Commute trips for employment represent a relatively small proportion of total trips and VMT; the 2009 National Household Travel Survey reported that work trips constitute 16.2 percent of the total trips (FHWA 2009).

In terms of traffic impacts, non-commuting vehicle trips can be reduced by providing trails, sidewalks, bike lanes, and transit opportunities and by linking the residential uses to nonresidential uses (e.g., shopping/retail, personal services, restaurants, office, cultural, and recreational uses). The proposed project includes these features, including a mix of land uses, various housing types and densities, areas designated for neighborhood commercial and person services uses, a community park, ample open space, pedestrian-friendly streets, and multi-use trails to encourage walking and biking. In addition, there is an opportunity for live-work units that incorporate both living and working space in Area H. It is estimated 215 dwelling units could potentially be constructed in Area H, although not all of these units are anticipated to be live-work units. For these reasons, the provision of additional commercially designated areas within the project boundaries was eliminated from further review.

5.0 ALTERNATIVES

The topic of jobs-housing balance is also discussed in Section 4.2, Population/Housing/Employment.

5.2 PROJECT ALTERNATIVES ANALYSIS

ALTERNATIVE 1 – NO PROJECT

4.1 Land Use

Alternative 1 would have no impacts to land use, as the existing land use designations and zone district would remain. The existing land use designations would require an Area Plan for much of the northern area of the project site. The southern portion of the site is designated Urban Residential High (23 acres, 20 units per acre) and Suburban Residential (118.67, 3 units per acre), which could allow development without adoption of an Area Plan. As with the proposed project, all City development codes and regulations would apply to any development of the property. The Area Plan requirement is not considered a significant environmental impact by the City, as the intent of the Area Plan is to ensure master planning of the site. Development of only a small portion of the site with the existing land use designations would not preclude the later adoption of an Area Plan consistent with the General Plan. As neither the proposed project nor the alternative would conflict with the land use planning intended for the site, this alternative would have similar impacts to those of the project.

4.2 Population/Housing/Employment

The property is designated for eventual development. The existing land use designations could result in a maximum of 444 housing units. Because of topography and other site characteristics, it is unlikely that building at full density could occur, and far fewer units would result. Under this alternative, the southern portion of the property would result in similar unit density to the proposed project. Because this alternative assumes no Area Plan, the resulting population increase of between 1,145 potential new residents is less than that of the proposed project.

The existing General Plan land use designations do not allow for commercial uses; therefore, this alternative would only result in temporary construction employment. As the alternative would result in a smaller construction area, employment associated with construction would also be less than that of the proposed project. Overall, as a smaller development with fewer residential units, this alternative's impacts to population, housing, and employment would be less than those of the proposed project.

4.3 Transportation and Circulation

Development of the Urban Residential High and Suburban Residential land use designations would generate approximately 4,250 average daily trips. Because of the smaller geographic area and the need to develop an Area Plan for the property to the north, these areas might not be able to provide access to the Mountain Gate interchange with I-5 and would need to connect directly to Black Canyon Drive in order to provide two roadway access points into and out of the development. This would increase the amount of traffic on Black Canyon Drive above that proposed by the project. If the Black Canyon Drive connection remained emergency-only as proposed, a secondary access would be required leading north, similar to that of the proposed project. While this would allow for emergency access, it is unlikely that residents would travel north to the Mountain Gate Interchange with I-5, then south to the city.

As a result, most of the AM and PM peak-hour traffic could reasonably be assumed to use the Cascade Boulevard/Shasta Dam Boulevard intersection during peak hours. This DEIR includes a mitigation measure that requires construction of a westbound right turn lane from Cascade Boulevard onto Shasta Dam Boulevard and two left turn lanes. These improvements would be required with this alternative, resulting in impacts similar to those of the proposed project. The proposed project plans an extensive network of trails and pathways to enable non-motorized circulation. While it is possible that subsequent development would have a similar trail network, the smaller area and fewer lots will result in a less extensive system.

4.4 Air Quality

Construction activities associated with these areas would involve grading, cutting, and fill to support infrastructure and buildings. These activities are similar to those of the proposed project, but will result in less of an impact because the area involved is much smaller than that of the proposed project. Development of the areas with Urban Residential High and Suburban Residential land use designations could result in additional homes, residents, and vehicle trips. These vehicle trips would result in air quality impacts similar to those of the proposed project, but would be less than the project because of fewer units and therefore fewer trips.

4.5 Noise

Only a small portion of the developable area in this alternative is adjacent to Interstate 5, which is the primary noise source in the project area. Construction equipment and methodology would be similar in approach but smaller in scale, resulting in individual noise impacts similar to the proposed project but with a shorter duration. Once occupied, the housing units would have similar noise generation and sensitivity characteristics to the proposed project.

4.6 Biological Resources

Development at the southern end of the project site would impact trees and a seasonal watercourse, resulting in the need for wetland permits similar to those of the proposed project. As most of the wetland areas occur in the northern and eastern areas of the project, this alternative would result in no impact to these areas and would therefore have less of an impact on wetlands than the proposed project.

4.7 Hydrology and Water Quality

Development of areas with Urban Residential High and Suburban Residential land use designations would result in the construction of roadways and other utilities to serve the potential development. As all development must comply with the City's grading ordinance and other development codes, construction impacts would be similar to those of the proposed project for the area designed for development. The remainder of the site would remain unaffected in this alternative. As there would be less overall development, there would be less impervious surface and therefore less impact on surface hydrology. The smaller developed area would also result in less water quality impact than the proposed project. Overall, the smaller development footprint would result in less impact on hydrology and water quality than the proposed project.

4.8 Geology and Soils

Development of areas with Urban Residential High and Suburban Residential land use designations would result in the construction of roadways and other utilities to serve the potential development. As all development must comply with the City's grading ordinance and other development codes, the impacts would be similar to those of the proposed project.

5.0 ALTERNATIVES

4.9 Cultural Resources

As discussed in Section 4.9, Cultural Resources, of this DEIR, cultural resources were discovered within the project boundaries. While the sites were outside of the area designated for development under this alternative, it is possible that there are sites within the development area that would be discovered during grading. Similar to the proposed project, mitigation measures would address any discoveries occurring during construction. Since both the proposed project and the development area considered in this alternative would avoid the known cultural sites, the impacts are considered similar.

4.10 Utilities and Service Systems

Development under this alternative would be required to extend water and sewer to the site in a manner similar to that of the proposed project. The routes and locations of various improvements would be similar to those of the proposed project, as would the potential impacts.

4.11 Public Services

This alternative would result in fewer potential housing units, which would reduce the area that would need to be provided with police, fire, and other municipal services. This would result in an impact to the services that would be proportionately less than the proposed project.

This alternative would potentially result in fewer new residents, which would place less of a demand on recreation facilities. The smaller area also reduces the potential to incorporate parks, trails, and other amenities into the project design. The need for additional open space is linked to an increase in population. At the rate of 5 acres per 1,000 residents, this alternative would result in a demand for 10 acres of parkland. As the community park planned for the project area is part of a community-wide park master plan, it is reasonable to assume that a community park would be required under the no project alternative. However, unlike the proposed project, there would likely not be room for the community park within the boundaries of this alternative. Overall, the recreation impacts are similar to those of the proposed project.

4.12 Aesthetics/Visual Resources/Light and Glare

As with the proposed project, grading will need to occur to achieve an efficient land use development pattern and density. The grading will alter the views of the site from Interstate 5 and will result in the removal of trees. Similar to the proposed project, compliance with the City's Tree Conservation Ordinance will help address some of the changes brought about by grading, but will still result in an impact. As the area for development under this alternative has more trees than the remainder of the project site and there will be less of an opportunity to plant replacement trees similar to the proposed project, the impact to trees from this alternative will be greater than that of the proposed project.

Lights associated with homes and roadways from development of this area would be similar to the residential component of the proposed project. As this alternative would not include nonresidential development and the overall area to be developed is less than that of the proposed project, the amount of light and glare impact associated with this alternative is less than the proposed project.

4.13 Greenhouse Gases and Climate Change

This alternative would result in less greenhouse gas generation because of its smaller potential development. Fewer housing units and less traffic would result in an impact less than that of the proposed project.

Summary

The no project alternative would result in fewer impacts to the environment than the proposed project. This is a function of a reduced number of housing units, fewer potential new residents, less traffic, and no commercial or nonresidential development. Development of only a portion of the project area, while consistent with the City's current General Plan, would not result in a comprehensively planned development within the city. This alternative would not provide pedestrian trails and open space, and would not allow for a mixed-use approach to development. Regardless, the no project alternative would have fewer impacts to the environment and is therefore considered the environmentally superior alternative.

ALTERNATIVE 2 – BLACK CANYON ROAD CONNECTION

Under this alternative, the development potential of the proposed project remains unchanged from that analyzed in this DEIR. This alternative would provide a public roadway connection to Black Canyon Road rather than the emergency vehicle and pedestrian connection proposed with the project. The intent of the alternative is to reduce vehicle miles traveled for residents heading into the downtown and municipal service areas of the city. The proposed vehicle route would require residents to travel south to Cascade Boulevard then west on Shasta Dam Boulevard to the downtown approximately 1.5 miles from the center of the project. This alternative would allow the same traffic to travel west connecting to Black Canyon Road and then southwest to the same destination, a route of approximately 1.0 miles.

4.1 Land Use

Land use impacts would be identical to those of the proposed project.

4.2 Population/Housing/Employment

As the development portion of the proposed project would remain unchanged, the impacts will be identical to the proposed project.

4.3 Transportation and Circulation

DEIR Appendix 4.3-1 evaluates the potential change in traffic associated with a Black Canyon Road extension into the project site. As noted in the analysis, the extension of the roadway would result in an additional 1,400 average daily trips and a level of service D on the roadway segment. The connection would result in negligible change at Interstate 5 and study area intersections. As the extension of the roadway would result in an unacceptable level of service on Black Canyon Road, a roadway unaffected by vehicle traffic from the project, and results in negligible changes to study area intersections and roadways, this alternative is considered to have a greater traffic impact than the proposed project.

5.0 ALTERNATIVES

4.4 Air Quality

The provision of another roadway into the proposed project would reduce idling at Cascade Boulevard. Traffic at the intersections would be reduced by about 7 percent as a small portion of project-related traffic would travel west along Black Canyon Road to reach destinations in town. The reduced idling time would result in small improvements to air quality; however, these improvements may be offset by idling at other locations farther west along Shasta Dam Boulevard. Because the number of trips anticipated on this roadway is small, the air quality impacts associated with this alternative are considered similar to those of the proposed project.

4.5 Noise

Roadway connection to Black Canyon Road would likely increase the amount of traffic by 1,400 average daily trips. These trips are likely to result in substantial noise compared to the existing condition. Because there will be an increase in noise associated with traffic when compared to that of the proposed project, this impact is considered greater than with the proposed project.

4.6 Biological Resources

Impacts to biological resources associated with this alternative would be similar to those of the proposed project. As proposed, a pedestrian/emergency vehicle access would be provided to Black Canyon Road. This alternative would widen the path to full road standards, changing the width from 20 feet to 28 feet to provide for two-way traffic with no parking. This additional area would likely be disturbed in constructing the proposed pedestrian way, so the impacts are considered similar to those of the proposed project.

4.7 Hydrology and Water Quality

The slight increase in paved roadway associated with this alternative would increase the amount of stormwater runoff that would need to be accommodated by the project. This increase is expected to be very small in the context of the proposed project. Overall impacts associated with hydrology and water quality are considered similar to those of the proposed project.

4.8 Geology and Soils

Under this alternative, the Black Canyon Road connection to the proposed project would be 60 feet wide and constructed as a local street. The existing roadway is in poor condition and may need to be reconstructed to support additional traffic. This would result in more grading and pavement than the proposed pedestrian/emergency vehicle-only connection. Overall, the impacts would be greater than those of the proposed project.

4.9 Cultural Resources

Because the development pattern of the project would not change with this alternative, the impact on cultural resources would be similar to that of the proposed project.

4.10 Utilities and Service Systems

As the development pattern of the project would not change with this alternative, the impact on utilities and service systems would be similar to that of the proposed project.

4.11 Public Services

Because the development pattern of the project would not change with this alternative, the impact on community services would be similar to that of the proposed project. Roadway maintenance might be increased on Black Canyon Road. However, as the roadway would need to be improved in order to serve the needs of this alternative, the resulting maintenance costs of a newly reconstructed roadway would not be expected to result in significant impacts. This impact is considered similar to the proposed project.

The development pattern of the project would not change with this alternative. Therefore, the impact on community services would be similar to that of the proposed project.

4.12 Aesthetics/Visual Resources/Light and Glare

As the development pattern of the project would not change with this alternative, the impact on aesthetics, visual resources, and light and glare would be similar to that of the proposed project.

4.13 Greenhouse Gases and Climate Change

Because the development pattern of the project would not change with this alternative, the projected generation of greenhouse gasses would be similar to that of the proposed project.

Summary

This alternative would provide another connection from the proposed project to existing development in the city. The project does not currently extend to the existing Black Canyon right-of-way and requires intervening land to connect to the roadway. This alternative would add traffic to an area not currently affected by the project. Black Canyon Road would need to be improved, and possibly reconstructed, to accommodate project traffic. In addition to construction impacts, this alternative would result in greater traffic, noise, and geology and soils impacts to this area of the city. The alternative would provide better access to the existing community and allow city residents to shop at the commercial areas anticipated in the proposed project. As this alternative would extend project impacts into areas of the city currently unaffected by the proposed project, the alternative would result in greater impacts than the proposed project.

ALTERNATIVE 3 – REDUCED WETLAND AND OAK WOODLAND ALTERNATIVE

As shown on **Figure 4.6-1** (Habitat Map) and **Figure 4.6-2** (Jurisdictional Waters of the U.S.), development of the site is not possible without impacting at least some of the wetland and oak woodland habitat. Access to the annual grassland areas shown in **Figure 4.6-1** requires crossing one or more of the seasonal drainages and cutting of trees to allow construction of the roadway and supporting utilities. This alternative assumes that development would occur on the annual grasslands that are located predominantly in the northern portion of the project site. **Table 5.0-3** shows the estimated percentage of area and amount of development potential remaining in each of the project subareas assuming maximum avoidance of wetlands, oak woodland, and slopes.

5.0 ALTERNATIVES

**TABLE 5.0-3
ALTERNATIVE 3 ESTIMATED DEVELOPMENT POTENTIAL**

Area	Primary Land Use	Acres	Developable		Commercial Square Feet	Residential Unit Range	
			%	Acres		Low	High
A	Commercial	11.20	100%	11.20	121,968	–	–
B	Open Space	181.50	0%	–	–	–	–
C	Park	7.30	50%	3.65		–	–
D	Medium Density Residential	27.90	10%	2.79		11	20
E	Medium Density Residential	22.50	70%	15.75		63	110
F	Very Low Density Residential	16.30	0%	–		–	–
G	Medium Density Mixed-Use Residential	43.50	80%	34.80		139	348
H	Mixed Use Commercial	14.9	100%	14.9	73,616	–	–
	High Density		100%			131	238
	Fire Station	2.00	100%	2.00		–	–
I	Medium Density Residential	7.30	100%	7.30		29	51
J	Medium Density Residential	8.10	60%	4.86		19	34
K	Park	7.60	0%	–		–	–
L	Low Density Residential	17.10	0%	–		–	–
M	Community Park	13.00	30%	3.90		–	–
	Low density Residential	19.40	30%	5.82		12	23
N	Low Density Residential	11.30	0%	–		–	–
O	Low Density Residential	13.10	0%	–		–	–
P	Low Density Residential	32.90	20%	6.58		13	26
Q	Very Low Density Residential	10.40	15%	1.56		2	3
	Electric Substation	2.00	15%	0.30		–	–
R	High Density Residential	4.50	0%	–		–	–
S	Very Low Density Residential	40.50	0%	–		–	–
T	Open Space	5.90	0%	–		–	–
U	Open Space	33.60	0%	–		–	–
ROW	Rights-of-Way	36.20		–		–	–
Alternative 3 Totals		590.00		115.41	195,584	419	853
Proposed Project Totals		590.00		590.00	195,584	873	1,604

This alternative assumes that the commercial square footage assumed in Areas A and H remains as shown in the proposed project, as these areas are largely affected by wetland or oak woodland habitat. The other development areas, including the open space, would be affected to some degree and as shown in **Table 5.0-3** would result in a reduction in the range of housing

units. (Note that the proposed project will also have restrictions associated with wetland and oak woodland habitat; however, these restrictions are analyzed in the DEIR and assumed in **Table 3.0-1** in Section 3.0, Project Description.)

The proposed project would result in the conversion of 11.62 acres of waters of the United States and 617 oak trees. (**Table 4.6-1**) While it is unrealistic to assume development on the site without some impact to either wetlands or oak trees, this alternative is intended to minimize impacts to these resources. This alternative assumes that creeks will need to be crossed to access the annual grassland and that 617 trees will need to be removed to allow the southern project access to Cascade Boulevard. Even with maximum avoidance, it is reasonable to assume that this alternative would fill more than 0.5 acres of waters of the US, which would trigger the need for an individual permit similar to that of the proposed project. This alternative assumes that only road crossings and less than 5 acres of wetlands will be affected. This alternative assumes that only the oak trees necessary for construction of the extension of the roadway would be removed and that replanting of trees would occur on the proposed project site.

4.1 Land Use

This alternative would not allow development of most of the project area to the density and intensity identified in the General Plan. As this is one of the few large areas of the city available for development, lack of development potential here will increase growth pressure at other locations in the city. Based on the habitats shown in **Figure 4.6-1** in Section 4.6, most of the development would be concentrated at the north end of the property with only the extension of Wonderland Boulevard to Shasta Dam Road impacting the oak woodland and wetland areas on the south end of the property. Unlike the proposed project, however, this alternative would not result in future development in Areas B, F, K, L, N, O, and R through U. As a result, the oak woodland and wetland habitat in these areas would remain largely unaffected. This alternative would result in less of an impact than the proposed project.

4.2 Population/Housing/Employment

This alternative would result in far fewer homes than originally proposed. The proposed project could result in between 2,252 and 4,138 new residents. **Table 5.0-4** shows the potential population associated with the unit yield range shown in **Table 5.0-3**.

TABLE 5.0-4
ALTERNATIVE 3, ESTIMATED POPULATION

	Estimated Population	
	Low	High
Proposed Project	2,252	4,138
Alternative	1,081	2,201
Difference	1,171	1,937
Percentage Change	-52%	-47%

The alternative would result in fewer residents than the proposed project but could result in a similar number of jobs associated with the commercial and nonresidential development. Providing for fewer residents in such a large area of the city will eventually result in the need for the City to seek other areas to accommodate population growth. As both the proposed project and this alternative are consistent with anticipated population growth within the project area, the impacts on population, housing, and employment are also similar.

4.3 Transportation and Circulation

While the number of housing units is reduced by nearly one-half with this alternative, the amount of nonresidential development remains unchanged from the proposed project. Fewer trips associated with fewer homes would reduce traffic impacts at several intersections and roadway segments. However, the DEIR identifies impacts at these locations as significant and unavoidable not because improvements cannot be made, but because the City does not have complete jurisdiction over the improvements. Because jurisdictional boundaries would not change as a result of this alternative, the same intersections and roadway segments would still require improvements that the City of Shasta Lake could not guarantee. Therefore, the resulting determination would be significant and unavoidable, similar to that of the proposed project.

4.4 Air Quality

Fewer homes and residences would reduce traffic trips and result in less air quality impact than the proposed project.

4.5 Noise

Fewer trips and homes would result in less potential noise associated with traffic under this alternative. As the development would be farther from Interstate 5, there would also be less exposure of residents to existing noise.

4.6 Biological Resources

This alternative is intended to result in less impact to waters of the US and oak woodlands than the proposed project. As shown on **Figure 4.6-1**, extension of Wonderland Boulevard to Cascade Boulevard would require a minimum of five crossings of waterways or drainages regulated by the US Army Corps of Engineers. Additional crossings of waterways would be required to permit access to the other development areas similar to the proposed project. However, as several of the proposed development areas would not allow construction under this alternative, there would be fewer crossings and therefore less impact to waters of the US than with the proposed project.

At the south end of the project site, approximately 617 trees would need to be removed to accommodate the extension of Wonderland Boulevard similar to the proposed project. As with the proposed project, it is anticipated that fuel maintenance would also result in the loss of vegetation in and around the oak woodland; however, the trees would remain largely intact. This alternative would result in less impact to waters of the US and to oak trees and oak woodland when compared to the proposed project.

4.7 Hydrology and Water Quality

This alternative results in less impervious surface, which would result in less stormwater than the proposed project. Further, less grading would occur with this alternative and would reduce the potential for construction dust and erosion impacts to affect water quality. While any development associated with this alternative would have similar impacts and mitigation measures to the proposed project, the smaller overall development area would result in water quality impacts less than the proposed project.

4.8 Geology and Soils

Under this alternative, much of the project site would remain unaffected by the proposed development. The project would result in less grading and less potential for impacts associated with fill and slope instability. The proposed nonresidential development is not typically associated with the use of hazardous materials. For the areas developed, the impacts to geology and soils would be similar to those of the proposed project. Overall, this alternative results in less developed area; therefore, the impact is considered less than the proposed project.

4.9 Cultural Resources

Similar to the proposed project, this alternative would also avoid the sensitive cultural resources within the project boundaries. However, as the overall development area would be less than the proposed project, the resulting potential for inadvertent discovery of sensitive resources would be less than that of the proposed project.

4.10 Utilities and Service Systems

As described in the DEIR, utilities for the project must be extended from Shasta Dam Boulevard or Black Canyon Road. Either of these sources would result in similar impacts to oak woodland and wetland habitat as the proposed project. The overall demand for services, however, would be less than the proposed project, as this alternative has fewer potential residents.

4.11 Public Services

As community services are based largely on population growth, the fewer units associated with this alternative would result in less demand for services. Locating development to the far north of the project site would result in less efficient provision of services. There would also be a large area of the site without direct oversight by residents, similar to the current condition. Under current conditions, there is a history of law enforcement actions associated with trespassing. The proposed project would address these issues by adding residents to the area who could observe and call for law enforcement.

Depending on the management method associated with the oak woodland, there could be a large cost to the City or residents for fuel management to minimize the potential for wildfire. Overall, this alternative results in a less efficient development pattern than the proposed project. While the inefficient development pattern slightly increases the cost of providing community services, the lower potential population would create less of a demand, which could offset the inefficiencies. This alternative is considered to have an impact similar to the proposed project on community services.

Recreational demand is based on population growth. As a result, the fewer units associated with this alternative would result in less demand for recreation. However, the proposed project includes a community park that would not otherwise be possible with this alternative. The community park would need to be located somewhere else in the city or removed from the parks master plan. Alternatively, the park could be located on one of the grassland areas, but then would further reduce the development potential of the alternative. As this alternative would likely not include the community park envisioned by the master plan, the impacts to recreation are considered greater than those of the proposed project.

5.0 ALTERNATIVES

4.12 Aesthetics/Visual Resources/Light and Glare

As the intent of this alternative is to reduce impacts to wetland and oak woodland habitat, the only visual change would be to annual grasslands. The development style in the areas of the alternative would be similar to the proposed project, resulting in light and glare as well as landscaping, walls, and other urban features. Because there would be less overall development, the impact on visual resources would be less than with the proposed project.

4.13 Greenhouse Gases and Climate Change

This alternative would result in a smaller development pattern, fewer homes and less commercial and would therefore result in less generation of greenhouse gases than the proposed project.

Summary

This alternative would result in fewer impacts to biological resources and in particular oak woodland and wetland habitat. Development potential would be reduced as a result of avoiding or reducing impacts. As the biological resources are concentrated toward the south end of the project site, development under this alternative would be focused at the north end of the property. This development pattern would result in an “isolated” development separated from the remainder of the City of Shasta Lake by open space.

5.3 ENVIRONMENTALLY SUPERIOR ALTERNATIVE

Table 5.0-5 provides a summary of the potential impacts of the alternatives evaluated in this section, as compared with the potential impacts of the proposed project.

CEQA Guidelines Section 15126.6(e)(2) requires that the environmentally superior alternative be identified. If the environmentally superior alternative is the no project alternative, the EIR shall also identify an environmentally superior alternative among other alternatives. The no project alternative was determined to have the fewest negative impacts on the physical environment. On most issues, the no project alternative would have less adverse environmental impacts than the proposed project. However, the no project alternative would not meet any of the objectives of the proposed project.

Because of its focus on avoiding biological resources, Alternative 3 is the environmentally superior alternative. **Table 5.0-6** compares the project objectives to Alternative 3 and includes a discussion of whether the alternative meets the objectives.

**TABLE 5.0-5
COMPARISON OF ALTERNATIVES TO THE PROPOSED PROJECT**

Issue	Alternative		
	1	2	3
4.1 Land Use	S	S	B
4.2 Population/Housing/Employment	B	S	S
4.3 Transportation and Circulation	S	W	S
4.4 Air Quality	B	S	B
4.5 Noise	S	W	B
4.6 Biological Resources	B	S	B
4.7 Hydrology and Water Quality	B	S	B

Issue	Alternative		
	1	2	3
4.8 Geology and Soils	S	W	B
4.9 Cultural Resources	S	S	B
4.10 Utilities and Service Systems	S	S	B
4.11 Public Services	B	S	S
4.12 Aesthetics/Visual Resources/Light and Glare	S	S	B
4.13 Greenhouse Gases and Climate Change	B	S	B
Overall	B	W	B

B – Impacts better than those of proposed project

S – Impacts same as those of proposed project, or no better or worse

W – Impacts worse than those of proposed project

TABLE 5.0-6
COMPARISON OF THE ENVIRONMENTAL SUPERIOR ALTERNATIVE TO THE PROPOSED PROJECT OBJECTIVES

Objective	Discussion	Compared to Proposed Project
Provide a comprehensively planned project that is sensitive to environmental issues including wetlands, flood protection, the City's hillside grading concerns, and tree preservation.	Alternative 3 affects fewer biological resources than the proposed project; however, it does not provide a comprehensively planned site. By clustering development at the far north end of the project site, the developed area would be isolated from the existing City of Shasta Lake.	W
Protect the highest quality natural features and resources of the site.	Alternative 3 meets this project objective.	B
Conform to General Plan policies that designate the project site for urban development through implementation of an Area Plan.	Alternative 3 allows for some development of the project site, but not to the extent envisioned in the General Plan or provided with the proposed project.	W
Promote compact mixed-use development that strives to provide a balance of uses, diverse housing and transportation choices, and contributes to a jobs-to-housing balance within the region.	With fewer potential residential parcels and the same amount of commercial and nonresidential development, Alternative 3 has the potential to result in a better jobs-housing balance than the proposed project. However, it is unlikely that this alternative would result in as diverse a housing opportunity as the proposed project.	B
Provide a balanced mix of land uses that will allow a self-sufficient community, thereby reducing demands on regional roadways and services.	It is unlikely that this alternative would result in as diverse a housing opportunity as the proposed project. It is also unlikely that there would be a sufficient customer base to support the proposed commercial development. This would result in a need to have customers come to the project site and increase demands on regional roadways.	W
Provide for a full range of housing densities and product choices affordable to a broad spectrum of income levels.	It is possible that Alternative 3 could result in a range of housing densities similar to those of the proposed project; however, the smaller development area necessarily limits the amount of potential development. As utilities and roadways must be extended through a large open space area without adjacent development, it is also probable that the resulting per-parcel cost will increase, which limits the potential for housing at all income levels.	W

5.0 ALTERNATIVES

Objective	Discussion	Compared to Proposed Project
Provide a master-planned community on a suitable site of sufficient size in proximity to an existing freeway, with access from existing interchange facilities.	Alternative 3 meets this objective. However, unlike the proposed project, this alternative would provide primary access from the Mountain Gate interchange with I-5. Access would be provided from Cascade Boulevard; however, it is unlikely that much of the project traffic would use this route, as the interstate would allow for faster travel.	W
Establish a circulation system that meets local and regional transportation needs and accommodates a variety of transportation modes, including off-street trail systems and on-street bicycle lanes.	As fewer areas would be developed, there would be less need for local roadways. This alternative assumes the Mountain Gate/Cascade Boulevard connection similar to the proposed project; however, many of the other proposed development areas would remain without roadway access. It is likely that a series of fire trails would be developed to allow for fuel management and access in the event of a wildfire.	S
Establish a pedestrian-friendly community that provides a continuous system of trails to link neighborhoods together and provide safe routes to parks and community-serving areas.	The non-motorized circulation system would not be as extensive as provided in the proposed project due to the expectation that Alternative 3 would avoid as much wetland, oak woodland, and riparian area as possible. This focus on avoidance limits the areas where trails could be developed. Further, as much of the south area of the site will remain undeveloped, connectivity to existing or future trails would likely be limited to the road rights-of-way.	W
Provide required park facilities sized to meet the needs of residents in the Area Plan and located as neighborhood focal elements.	It is unlikely that this alternative would have the land area without biological constraints needed to support a community park. For purposes of this EIR, this alternative assumes that the community park would be relocated or removed.	W
Provide a comprehensively planned infrastructure system (e.g., water treatment and distribution systems, sewer treatment and collection systems, electrical distribution systems, fire suppression facilities, general government facilities) to serve the needs of future residents of the development area.	This alternative would need public utilities similar to those of the proposed project. While the extension of facilities to the smaller project would result in a less efficient use of services, the impacts associated with construction of the utilities (e.g. grading, trenching, paving) would be similar to those of the proposed project.	S
Provide adequate infrastructure improvements without adversely affecting existing levels of service.	The City would require this alternative to provide for adequate infrastructure similar to the proposed project and similar to any development within the City.	S
Phase development and infrastructure to respond to market demand while requiring new development to provide the infrastructure and public facilities necessary to serve the developing area.	The alternative would have phasing of infrastructure tailored to the needs of the development schedule. Any development with the potential for phasing, such as this alternative and the proposed project, would similarly phase infrastructure as needed to support construction.	S

B: Meets this objective better than the proposed project

S: Meets this objective similar to the proposed project; no better or worse

W: Meets this objective worse than the proposed project

6.0 OTHER EVALUATIONS REQUIRED BY CEQA

6.0 OTHER EVALUATIONS REQUIRED BY CEQA

This section discusses the additional topics statutorily required by the California Environmental Quality Act (CEQA). The topics discussed include cumulative impacts, significant and unavoidable environmental impacts, growth-inducing impacts, and significant irreversible environmental changes/irretrievable commitment of resources.

6.1 CUMULATIVE IMPACTS

CEQA requires that an environmental impact report (EIR) contain an assessment of the cumulative impacts that could be associated with the proposed project. According to CEQA Guidelines Section 15130(a), “an EIR shall discuss cumulative impacts of a project when the project’s incremental effect is cumulatively considerable.” *Cumulatively considerable* means that the incremental effects of an individual project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects (as defined by Section 15130). As defined in CEQA Guidelines Section 15355, a cumulative impact is an impact created as a result of the combination of the project evaluated in the EIR together with other projects causing related impacts. A cumulative impact occurs from:

... the change in the environment which results from the incremental impact of the project when added to other closely related past, present, and reasonably foreseeable future projects. Cumulative impacts can result from individually minor but collectively significant projects taking place over a period of time.

In addition, Section 15130(b) identifies the following elements as necessary for an adequate cumulative impact analysis:

- 1) *Either:*
 - (A) *A list of past, present, and probable future projects producing related or cumulative impacts, including, if necessary, those projects outside the control of the agency; or*
 - (B) *A summary of projections contained in an adopted general plan or related planning document, or in a prior environmental document which has been adopted or certified, which described or evaluated regional or area-wide conditions contributing to the cumulative impact. Any such planning document shall be referenced and made available to the public at a location specified by the lead agency.*
- 2) *A definition of the geographic scope of the area affected by the cumulative effect and a reasonable explanation for the geographic limitation used;*
- 3) *A summary of the expected environmental effects to be produced by those projects with specific reference to additional information stating where that information is available; and*
- 4) *A reasonable analysis of the cumulative impacts of the relevant projects. An EIR shall examine reasonable, feasible options for mitigating or avoiding the project’s contribution to any significant cumulative effects.*

6.0 OTHER EVALUATIONS REQUIRED BY CEQA

Where a lead agency is examining a project with an incremental effect that is not cumulatively considerable, a lead agency need not consider that effect significant, but is to briefly describe its basis for concluding that the incremental effect is not cumulatively considerable.

APPROACH TO THE CUMULATIVE IMPACT ANALYSIS

The analysis of cumulative impacts for each environmental factor can employ one of two methods to establish the effects of other past, current, and probable future projects. A lead agency may select a list of projects, including those outside the control of the agency, or alternatively, a summary of projects which may be from an adopted general plan, a related planning document, or from a prior environmental document that has been adopted or certified that describe or evaluate regional or area-wide conditions contributing to the cumulative impact. The analysis provided in this Draft EIR utilizes the latter approach.

CUMULATIVE IMPACTS ANALYSIS

This subsection provides an analysis of overall cumulative impacts of the proposed Area Plan taken together with other past, present, and probable future projects producing related impacts, as required by Section 15130 of the CEQA Guidelines. The goal of such an exercise is twofold: first, to determine whether the overall long-term impacts of all such projects would be cumulatively significant; and second, to determine whether the proposed project itself would cause a cumulatively considerable (and thus significant) incremental contribution to any such cumulatively significant impacts. (See CEQA Guidelines Section 15130[a]–[b], Section 15355[b], Section 15064[h], Section 15065[c]; *Communities for a Better Environment v. California Resources Agency* [2002] 103 Cal.App.4th98, 120.) In other words, the required analysis intends to create a broad context in which to assess the proposed project's incremental contribution to anticipated cumulative development impacts, viewed on a geographic scale well beyond the project site itself, and then to determine whether the project's incremental contribution to any significant cumulative impacts from all projects is itself significant (i.e., cumulatively considerable in CEQA parlance).

Pursuant to CEQA Guidelines Section 15130, “the discussion of cumulative impacts shall reflect the severity of the impacts and their likelihood of occurrence, but the discussion need not provide as great detail as is provided for the effects attributable to the project alone. The discussion should be guided by the standards of practicality and reasonableness, and should focus on the cumulative impacts to which the identified other projects contribute rather than the attributes of other projects which do not contribute to the cumulative impact.” The proposed project is considered to have a significant cumulative effect if:

- The cumulative effects of development without the project are not significant and the project's additional impact is substantial enough, when added to the cumulative effects, to result in a significant impact; or
- The cumulative effects of development without the project are already significant and the project contributes measurably to the effect. The term “measurably” is subject to interpretation. The standards used herein to determine measurability are that the impact either must be noticeable to a reasonable person or must exceed an established threshold of significance.

Identified below is a summary of the cumulative impacts that would result from the implementation of the proposed Area Plan and future growth in the vicinity. The following cumulative impacts of the proposed project are specifically identified in Sections 4.1 through

4.13 of this Draft EIR. The reader is referred to the various environmental issue areas of these sections for further details and analysis of the cumulative impacts.

Land Use

Cumulative Setting

The cumulative setting consists includes all existing, approved, proposed, and reasonably foreseeable development in southern Shasta County surrounding the Interstate 5 (I-5) corridor from the City of Shasta Lake south to the county line. The majority of lands along the I-5 corridor are designated for urban uses by the Cities of Redding and Anderson, yet there are also unincorporated lands in Shasta County primarily in use for agricultural purposes or suburban residential.

Cumulative Land Use Development Impacts

Impact 4.1.5 The project would introduce growth into an area that is currently undeveloped and could encourage growth on lands outside of the city. This impact is **less than cumulatively considerable**.

Population/Housing/Employment

Cumulative Setting

The City of Shasta Lake is located in the northernmost extent of California's Central Valley. The entire 590-acre project site is located within the northern limits of the city. The cumulative setting for population, housing, and employment includes approved and proposed development in the region as well as development anticipated by the City of Shasta Lake as identified in the General Plan. **Table 4.2-4** provides population projections for the City of Shasta Lake through the next ten years, through the year 2023. Regional population, housing, and employment demographics are detailed in subsection 4.2.1, Existing Setting.

Cumulative Population Growth Impacts

Impact 4.2.2 Development of the Mountain Gate at Shasta Area Plan, along with approved and proposed development, would result in increased population in the City of Shasta Lake. This is considered a **less than cumulatively considerable** impact.

Transportation and Circulation

Cumulative Setting

The cumulative setting for traffic and circulation consists of traffic generated by all existing and future (cumulative) development in the project area. For the purposes of this analysis, the planning horizon for future traffic condition considers cumulative conditions in the Year 2020 and Year 2030.

6.0 OTHER EVALUATIONS REQUIRED BY CEQA

Conflict with Applicable Intersection Level of Service – Cumulative Year 2020 Plus Project Conditions

Impact 4.3.8 Under Year 2020 Plus Project conditions, all study area intersections would meet level of service standards with the imposition of mitigation. However, six study intersections are wholly outside the City of Shasta Lake's jurisdiction, and the City cannot be certain that mitigation will be made. Therefore, this impact would be **cumulatively considerable**.

Conflict with Applicable Roadway Level of Service – Cumulative Year 2020 Plus Project Conditions

Impact 4.3.9 Following implementation of the proposed project, all study area roadway segments would meet level of service standards under Year 2020 Plus Project conditions. Therefore, this impact would be **less than cumulatively considerable**.

Conflict with Applicable Freeway Mainline Segment Level of Service – Cumulative Year 2020 Plus Project Conditions

Impact 4.3.10 Implementation of the proposed project would result in an increase in traffic volumes on vicinity freeways that would operate below level of service thresholds under Year 2020 Plus Project conditions. While the imposition of mitigation would reduce this impact, vicinity freeways are wholly outside the City of Shasta Lake's jurisdiction, and the City cannot be certain that mitigation will be made. Therefore, this impact would be **cumulatively considerable**.

Conflict with Applicable Ramp Junction Level of Service – Cumulative Year 2020 Plus Project Conditions

Impact 4.3.11 Implementation of the proposed project would result in an increase in traffic volumes on vicinity freeway ramp junctions under Year 2020 Plus Project conditions that would exacerbate unacceptable level of service. While the imposition of mitigation would reduce this impact, vicinity freeway ramp junctions are wholly outside the City of Shasta Lake's jurisdiction, and the City cannot be certain that mitigation will be made. Therefore, this impact would be **cumulatively considerable**.

Conflict with Applicable Level of Service Due to Wonderland Boulevard Extension – Cumulative 2020 Plus Project Conditions

Impact 4.3.12 Implementation of the Wonderland Boulevard southern access extension conceptualized under the proposed project would result in an exceedence of level of service thresholds under Year 2020 Plus Project conditions. This impact would be **cumulatively considerable**.

6.0 OTHER EVALUATIONS REQUIRED BY CEQA

Conflict with Applicable Intersection Level of Service – Cumulative Year 2030 Plus Project Conditions

Impact 4.3.13 Under Year 2030 Plus Project conditions, all study area intersections would meet level of service standards with the imposition of mitigation. However, six study intersections are wholly outside the City of Shasta Lake's jurisdiction, and the City cannot be certain that mitigation will be made. Therefore, this impact would be **cumulatively considerable**.

Conflict with Applicable Roadway Level of Service – Cumulative Year 2030 Plus Project Conditions

Impact 4.3.14 Following implementation of the proposed project, all study area roadway segments would meet level of service standards under Year 2030 Plus Project conditions. Therefore, this impact would be **potentially cumulatively considerable**.

Conflict with Applicable Freeway Mainline Segment Level of Service – Cumulative Year 2030 Plus Project Conditions

Impact 4.3.15 Implementation of the proposed project would result in an increase in traffic volumes on vicinity freeways that would operate below level of service thresholds under Year 2030 Plus Project conditions. While the imposition of mitigation would reduce this impact, vicinity freeways are wholly outside the City of Shasta Lake's jurisdiction, and the City cannot be certain that mitigation will be made. Therefore, this impact would be **cumulatively considerable**.

Conflict with Applicable Ramp Junction Level of Service – Cumulative Year 2030 Plus Project Conditions

Impact 4.3.16 Implementation of the proposed project would result in an increase in traffic volumes on vicinity freeway ramp junctions under Year 2030 Plus Project conditions that would exacerbate unacceptable level of service. While the imposition of mitigation would reduce this impact, vicinity freeway ramp junctions are wholly outside the City of Shasta Lake's jurisdiction, and the City cannot be certain that mitigation will be made. Therefore, this impact would be **cumulatively considerable**.

Conflict with Applicable Level of Service Due to Wonderland Boulevard Extension – Cumulative Year 2030 Plus Project Conditions

Impact 4.3.17 Implementation of the Wonderland Boulevard southern access extension conceptualized under the project would result in an exceedence of level of service thresholds under Year 2030 Plus Project conditions. This impact would be **cumulatively considerable**.

6.0 OTHER EVALUATIONS REQUIRED BY CEQA

Air Quality

Cumulative Setting

The cumulative setting for air quality includes the City of Shasta Lake in its entirety and the North Sacramento Valley Air Basin (NSVAB). The Shasta County portion of the NSVAB is designated as a non-attainment area for O₃ and PM₁₀ for state standards. The Shasta County portion of the NSVAB is designated as being unclassified and/or attainment for all pollutants under federal standards. Cumulative growth in population, vehicle use, and industrial activity could inhibit efforts to improve regional air quality and attain the ambient air quality standards.

Contribution to Net Increase of Air Pollutants for Which the NSVAB Is Nonattainment

Impact 4.4.6 Long-term operation of the project would result in increased emissions of ozone-precursor pollutants and PM₁₀ that would exceed applicable significance thresholds and could contribute to future concentrations of ozone and PM₁₀, for which the region is currently designated nonattainment. This impact would be considered **cumulatively considerable** and **significant and unavoidable**.

Contribution to Cumulative CO and TAC Concentrations

Impact 4.4.7 Implementation of the proposed project, in combination with existing, approved, proposed, and reasonably foreseeable development in the North Sacramento Valley Air Basin, would not contribute to localized concentrations of mobile-source CO or TACs that would exceed applicable ambient air quality standards. This impact would be considered **less than cumulatively considerable**.

Noise

Cumulative Setting

The geographic extent of the cumulative setting for noise consists of the project area and the surrounding areas within the city, since noise is a localized phenomenon. Cumulative development conditions would result in increased cumulative roadway noise levels and would also result in increased noise associated with future development. The primary factor for cumulative noise impact analysis is the consideration of future traffic volumes that will generate noise impacting on-site uses.

Cumulative Contribution to Traffic Noise Levels

Impact 4.5.6 Implementation of the proposed project would not result in a substantial contribution to future cumulative traffic noise levels. This would be a **less than cumulatively considerable** impact.

Biological Resources

Cumulative Setting

The cumulative setting for the project is the same as described under the discussion of biological communities in the Existing Setting subsection of Section 4.6.

Cumulative Wetland Impacts

Impact 4.6.8 Buildout of the proposed project may affect wetland resources. This impact is **potentially cumulatively considerable**.

Cumulative Oak Woodland Impacts

Impact 4.6.9 Buildout of the proposed project will result in the loss of oak woodland habitat. This impact is **cumulatively considerable**.

Cumulative Heritage Tree Impacts

Impact 4.6.10 Buildout of the proposed project would result in the loss of heritage oak trees. This impact is **potentially cumulative considerable**.

Hydrology and Water Quality

Cumulative Setting

The cumulative setting for impacts related to hydrology and water quality includes the Sacramento River Hydrologic Region. This drainage basin is approximately 27,200 square miles in size and encapsulates the project site. In addition to the proposed project, several other developments have been approved, are planned, or are proposed in the Shasta County region, which could cumulatively affect hydrologic conditions and water quality.

Cumulative Drainage and Flooding Impacts

Impact 4.7.8 The proposed project, in combination with planned and proposed development in the City of Shasta Lake, would alter drainage conditions and rates, which could result in potential flooding impacts. This is considered a **less than cumulatively considerable** impact.

Cumulative Water Quality Impacts

Impact 4.7.9 The proposed project, in combination with planned and proposed development in the City of Shasta Lake, would contribute to potential impacts to surface and groundwater quality from construction and operation activities. This is considered to be a **less than cumulatively considerable** impact.

Geology and Soils

Cumulative Setting

Geology and soil-related impacts are generally site-specific and are determined by a particular site's soil characteristics, topography, and proposed land uses. Development projects are analyzed on an individual basis and must comply with established requirements of the City of Shasta Lake and the California Building Standards Code as they pertain to protection against known geologic hazards and potential geologic and soil-related impacts.

6.0 OTHER EVALUATIONS REQUIRED BY CEQA

Cumulative Geologic Impacts

Impact 4.8.7 Implementation of the proposed project in combination with reasonably foreseeable development would not contribute to cumulative geologic and soil impacts, as the impacts would be site-specific. This would be a **less than cumulatively considerable** impact under cumulative conditions.

Cultural Resources

Cumulative Setting

The cumulative setting associated with the proposed project includes proposed, planned, reasonably foreseeable, and approved projects in the vicinity of the project site.

Cumulative Prehistoric and Historic Resources

Impact 4.9.7 Implementation of the proposed project, along with any foreseeable development in the project vicinity, could result in cumulative impacts to cultural resources. This is considered a **less than cumulatively considerable** impact.

Utilities and Service Systems

Cumulative Water Supply Setting

The cumulative setting for water resources includes the 10.8-square-mile service boundaries of the City of Shasta Lake water service area. There are 50 pending projects identified in the 2004 update to the 1998 Master Water Plan. These projects in addition to future projects would cumulatively increase water demand.

Cumulative Water Service Impacts

Impact 4.10.1.3 Implementation of the proposed project, in combination with cumulative development, would increase the current demand for water supply service. This impact is considered to be **cumulatively considerable**.

Cumulative Wastewater Service Setting

The cumulative setting for wastewater is the City of Shasta Lake. The City's ability to expand the capacity of the treatment plant is limited by the discharges allowed in Churn Creek and the unavailability of large reclaimed water users in the area. The WWTP was designed for an average dry weather flow (ADWF) of 1.3 MGD and a peak wet weather flow of 5.2 MGD. The Plant was also designed and constructed in anticipation that the plant would eventually be expanded to 2.3 MGD.

As discussed in Section 4.10 the City is in the process of studying the completion of improvements to the WWTP. Completion of the improvements is crucial in order to accommodate future development in the city. Currently, the WWTP is at 88 percent of operational capacity and can accommodate approximately 415 additional household equivalents (HEs) due to limitations on disposal of reclaimed water. Completion of the WWTP project will restore the WWTP to its original design capacity of 1.3 MGD, enough to accommodate a total of approximately 6,436

household equivalents. The WWTP currently accommodates a total of approximately 3,786 HEs; therefore, there are approximately 2,650 HEs remaining.

Cumulative Wastewater Service Impacts

Impact 4.10.2.3 Implementation of the proposed project, in combination with other developments within the Shasta Lake water service area, would increase wastewater flows and the current demand for wastewater treatment services. This would be a **cumulatively considerable** impact.

Cumulative Solid Waste Service Setting

The cumulative setting for solid waste service includes the City of Shasta Lake's service area and solid waste transported and disposed at the Richard W. Curry/West Central Sanitary Landfill. The landfill currently has 19.5 years of remaining capacity and is currently estimated to be full by December 2032. The County will begin the process of seeking permits to expand the landfill around 2017, 15 years prior to the estimated fill date. Assembly Bill (AB) 939 requires all cities and counties to divert 50 percent of solid waste from landfills as of January 1, 2000. In 1997, a Source Reduction and Recycling Element (SSRE) was prepared for the City of Shasta Lake to meet the requirements of AB 939 and the cleanup legislation. The SSRE is a plan that provides mechanisms to be implemented for source reduction, recycling, special wastes, composting, and education and public information programs in the City of Shasta Lake. Shasta County and the cities of Redding and Anderson have recycling facilities and programs that benefit the City of Shasta Lake.

Cumulative Solid Waste Disposal Impacts

Impact 4.10.3.3 The project would contribute to cumulative demands for solid waste disposal services. This impact is considered to be **less than cumulatively considerable**.

Cumulative Electric, Natural Gas, Telephone, and Cable Service Setting

The proposed project, in conjunction with other development in the region, would cumulatively increase electric, natural gas, telephone, and cable service demand and related facilities.

Cumulative Electric, Natural Gas, Telephone, and Cable Service Impacts

Impact 4.10.4.2 Implementation of the proposed project, in addition to reasonably foreseeable developments in the area, would include the extension of existing infrastructure and require new facilities to accommodate the anticipated growth. This is considered a **less than cumulatively considerable** impact.

Public Services

Cumulative Service for Fire Protection

The proposed project, in conjunction with future development in the area, would result in an increased need for fire protection services. The proposed Mountain Gate at Shasta Area Plan would increase the population in the area by an estimated 4,138 persons. The land has been designated for development since adoption of the City's General Plan. The City has anticipated that the proposed project site will be developed with a mix of uses and implemented with an Area Plan.

6.0 OTHER EVALUATIONS REQUIRED BY CEQA

Fire protection within the City of Shasta Lake is provided through the Shasta Lake Fire Protection District (SLFPD). Because of its proximity along Mountain Gate Road, within 250 feet of the project site, it is anticipated that the Mountain Gate Volunteer Fire Station also would respond to service calls within the project.

Cumulative Fire Services Impacts

Impact 4.11.1.3 The proposed project, in addition to foreseeable development, would increase the population within the SLFPD service area and require additional fire and emergency medical services. This would be a **less than cumulatively considerable** impact.

Cumulative Setting for Police Protection

The proposed project, in conjunction with future development in the area, would result in an increased need for police protection services. The proposed Mountain Gate at Shasta Area Plan would increase the population in the area by an estimated 4,138 persons. The land has been designated for development since adoption of the City's General Plan. Police protection is contracted through the Shasta County Sheriff's Department. In emergencies, additional personnel are available through the full resources of the Sheriff's Department and mutual aid agreements with other agencies.

Cumulative Law Enforcement Impacts

Impact 4.11.2.2 The proposed project, in addition to foreseeable development, would increase the population in the City of Shasta Lake and require additional law enforcement services. This would be a **potentially cumulatively considerable** impact.

Cumulative Setting for Public Schools

The cumulative setting for public school impacts includes the district boundaries for the Gateway Unified School District. Any existing, planned, proposed, approved, and reasonably foreseeable development in the cumulative setting could result in cumulative impacts.

Cumulative Impacts to School Facilities

Impact 4.11.3.2 The proposed project, in combination with foreseeable development proposed in the city, would result in a cumulative increase in student enrollment. This would be considered a **less than cumulatively considerable** impact.

Cumulative Parkland Setting

The cumulative setting for recreation includes the project, surrounding development in the area, and the City of Shasta Lake.

Cumulative Impacts on Parks, Recreational Facilities, and Trails

Impact 4.11.4.2 The proposed project and other foreseeable development would require additional park and recreation facilities in the City of Shasta Lake. This would be a **less than cumulatively considerable** impact.

Aesthetics/Visual Resources/Light and Glare

Cumulative Setting

The cumulative setting for visual resources consists of the project site, as well as all existing, approved, proposed, and reasonably foreseeable development in the immediate area. The area in this cumulative setting is characterized by rural residential development and open space.

Cumulative Aesthetic Impacts

Impact 4.12.6 Implementation of the proposed project would contribute to the cumulative conversion of the area from moderately disturbed open space to other urban uses. This impact is considered to be **less than cumulatively considerable**.

Greenhouse Gases and Climate Change

Cumulative Setting

Greenhouse gas (GHG) emissions contribute, on a cumulative basis, to the significant adverse environmental impacts of global climate change. No single project could generate enough GHG emissions to noticeably change the global average temperature.

Generate GHG Emissions That May Have a Significant Impact on the Environment

Impact 4.13.1 Implementation of the proposed project would result in a net increase in GHG emissions, yet would not result in a significant impact on the environment. This impact is **less than cumulatively considerable**.

Conflict with Assembly Bill 32

Impact 4.13.2 Implementation of the proposed project would result in a net increase in greenhouse gas emissions and could conflict with the goals of AB 32. This impact is **potentially cumulatively considerable**.

6.2 GROWTH-INDUCING IMPACTS

INTRODUCTION

CEQA Guidelines Section 15126.2(d) requires that an EIR evaluate the growth-inducing impacts of a proposed action. A growth-inducing impact is defined by the CEQA Guidelines as:

The way in which a proposed project could foster economic or population growth, or the construction of additional housing, either directly or indirectly, in the surrounding environment. Included in this are projects which would remove obstacles to population growth. It is not assumed that growth in an area is necessarily beneficial, detrimental, or of little significance to the environment.

A project can have direct and/or indirect growth inducement potential. For example, direct growth inducement potential would result if a project involved construction of new housing. A project would have indirect growth inducement potential if it established substantial new permanent employment opportunities or if it involved a construction effort with substantial short-

6.0 OTHER EVALUATIONS REQUIRED BY CEQA

term employment opportunities that would indirectly stimulate the need for additional housing and services to support the new employment demand (*Napa Citizens for Honest Government v. Napa County Board of Supervisors* (2001) 92 Cal. App 4th 15). Similarly, a project would indirectly induce growth if it removed an obstacle to additional growth and development, such as removing a constraint on a required public service. A project providing an increased water supply in an area where water service historically limited growth could be considered growth-inducing.

The CEQA Guidelines further explain that the environmental effects of induced growth are considered indirect impacts of the proposed action. These indirect impacts or secondary effects of growth may result in significant, adverse environmental impacts. Potential secondary effects of growth include increased demand on other community and public services and infrastructure, increased traffic and noise, and adverse environmental impacts such as degradation of air and water quality, degradation or loss of plant and animal habitat, and conversion of agricultural and open space land to developed uses.

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 for land use development patterns and growth policies that allow for the orderly expansion of urban development supported by adequate urban public services, such as water supply, roadway infrastructure, sewer service, and solid waste service.

COMPONENTS OF GROWTH

The timing, magnitude, and location of land development and population growth in a community are based on various interrelated land use and economic variables. Key variables include regional economic trends, market demand for residential and nonresidential uses, land availability and cost, the availability and quality of transportation facilities and public services, proximity to employment centers, the supply and cost of housing, and regulatory policies or conditions. Since the general plan of a community defines the location, type, and intensity of growth, it is the primary means of regulating development and growth in California.

GROWTH EFFECTS OF THE PROJECT

The proposed Area Plan would guide future development in the project area. While the Area Plan does not, in itself, mandate or propose any specific development, future development will be required to meet the design, land use, and other requirements of the Area Plan. This includes all aspects of future land use, including structure design, allowed uses, parking, street design, transit accommodation, parks, landscaping, and other aspects of physical development. Furthermore, by utilizing the allowed land uses and densities delineated in the Area Plan, an assumed amount of development that would likely occur on the project site has been formulated (see Section 3.0, Project Description).

Buildout of the Area Plan area would allow for approximately 1,604 dwelling units and up to 195,584 square feet of nonresidential development on approximately 590 acres. This development represents direct growth in the Area Plan area and in the city as a whole. The direct growth inducement of the project is discussed in Section 4.2, Population/Housing/Employment. The associated secondary effects of this growth are discussed in aggregate in the various technical sections of this Draft EIR (Sections 4.1 through 4.13).

Population Growth

As described in Section 4.2, Population/Housing/Employment, the direct growth anticipated from the Area Plan would add approximately 1,604 dwellings to the city for an estimated population increase of 4,138. However, the proposed project would extend the city along the I-5 corridor north of the main developed portions of the community in an area of the city that has been designated for development since adoption of the City's General Plan. Therefore, the City has anticipated that the proposed project site will be developed with a mix of uses and implemented with an Area Plan.

GROWTH EFFECTS ASSOCIATED WITH INFRASTRUCTURE IMPROVEMENTS

The potential to indirectly induce growth is assumed to exist if a project would remove an obstacle to additional growth and development, such as removing a constraint on a required public service, or if construction of additional infrastructure or resources resulted in excess capacity that would allow additional growth to occur. In the case of the proposed Area Plan, all infrastructure and utilities are located immediately adjacent to or within the Area Plan area. Land uses in the Area Plan would utilize existing capacity for all services and utilities and would connect to existing networks. As no excess capacity would be created by the Area Plan, indirect growth effects are not anticipated.

ENVIRONMENTAL EFFECTS OF GROWTH

The intent of the proposed Area Plan is to accommodate anticipated growth through compact, walkable, and mixed-use development. The City's General Plan provides for this anticipated growth, as does planning by service and utility providers. Thus, growth accommodated under the proposed Area Plan would be confined to the immediate Area Plan area and would avoid growth effects on adjacent parcels. The environmental effects of buildout of the Area Plan are addressed in Sections 4.1 through 4.13 of this Draft EIR, and the project's cumulative impacts are addressed above in subsection 6.1.

6.3 SIGNIFICANT IRREVERSIBLE ENVIRONMENTAL CHANGES

CEQA Guidelines Sections 21100(b)(2) and 21100.1(a) require that EIRs prepared for the adoption of a plan, policy, or ordinance of a public agency must include a discussion of significant irreversible environmental changes that would result from project implementation. In addition, CEQA Guidelines Section 15126.2(c) describes irreversible environmental changes in the following manner:

Uses of nonrenewable resources during the initial and continued phases of the project may be irreversible since a large commitment of such resources makes removal or nonuse thereafter unlikely. Primary impacts and, particularly, secondary impacts (such as highway improvement which provides access to a previously inaccessible area) generally commit future generations to similar uses. Also irreversible damage can result from environmental accidents associated with the project. Irretrievable commitments of resources should be evaluated to assure that such current consumption is justified.

Implementation of the proposed Area Plan would result in the conversion of undeveloped properties zoned for development. Subsequent development under the Area Plan would constitute a long-term commitment to these uses. It is unlikely that circumstances would arise that would justify the return of those sites to their original condition.

6.0 OTHER EVALUATIONS REQUIRED BY CEQA

Development of the Area Plan would irretrievably commit building materials and energy to the construction and maintenance of buildings and infrastructure. Renewable, nonrenewable, and limited resources that would likely be consumed as part of the development of the proposed Area Plan would include, but are not limited to, oil, gasoline, lumber, sand and gravel, asphalt, water, steel, and similar materials. In addition, development of the project would result in the increased demand on utilities and public services (see Sections 4.10 and 4.11).

6.4 SIGNIFICANT UNAVOIDABLE IMPACTS

CEQA Guidelines Section 15126.2(b) requires an EIR to discuss unavoidable significant environmental effects, including those that can be mitigated but not reduced to a level of insignificance. In addition, Section 15093(a) of the CEQA Guidelines allows the decision-making agency to determine whether the benefits of a proposed project outweigh the unavoidable adverse environmental impacts of implementing the project. The City can approve a project with unavoidable adverse impacts if it prepares a Statement of Overriding Considerations setting forth the specific reasons for making such a judgment.

The following impacts of the proposed Area Plan, which have been recognized as significant and unavoidable in either the project or cumulative context, are specifically identified in Sections 4.1 through 4.13 of this Draft EIR. The reader is referred to the various environmental issue areas of these sections for further details and analysis of these significant and unavoidable impacts.

TRANSPORTATION AND CIRCULATION

Conflict with Applicable Intersection Level of Service – Near-Term Plus Project Conditions

Impact 4.3.1 Under Near-Term Plus Project conditions, all study area intersections would meet level of service standards with the imposition of mitigation. However, six study intersections are wholly outside the City of Shasta Lake's jurisdiction and the City cannot be certain that mitigation will be made. Therefore, this impact would be **significant and unavoidable**.

Conflict with Applicable Freeway Mainline Segments Level of Service – Near-Term Plus Project Conditions

Impact 4.3.3 Implementation of the proposed project would result in an increase in traffic volumes on vicinity freeways that would operate below level of service thresholds under Near-Term Plus Project conditions. While the imposition of mitigation would reduce this impact, vicinity freeways are wholly outside the City of Shasta Lake's jurisdiction and the City cannot be certain that mitigation will be made. Therefore, this impact would be **significant and unavoidable**.

Conflict with Applicable Ramp Junction Level of Service – Near-Term Plus Project Conditions

Impact 4.3.4 Implementation of the proposed project would result in an increase in traffic volumes on vicinity freeway ramp junctions that would operate below level of service thresholds under Near-Term Plus Project conditions. While the imposition of mitigation would reduce this impact, vicinity freeway ramp junctions are wholly outside the City of Shasta Lake's jurisdiction, and the City

cannot be certain that mitigation will be made. Therefore, this impact would be **significant and unavoidable**.

Conflict with Applicable Intersection Level of Service – Cumulative Year 2020 Plus Project Conditions

Impact 4.3.8 Under Year 2020 Plus Project conditions, all study area intersections would meet level of service standards with the imposition of mitigation. However, six study intersections are wholly outside the City of Shasta Lake's jurisdiction and the City cannot be certain that mitigation will be made. Therefore, this impact would be **cumulatively considerable** and **significant and unavoidable**.

Conflict with Applicable Freeway Mainline Segment Level of Service – Cumulative Year 2020 Plus Project Conditions

Impact 4.3.10 Implementation of the proposed project would result in an increase in traffic volumes on vicinity freeways that would operate below level of service thresholds under Year 2020 Plus Project conditions. While the imposition of mitigation would reduce this impact, vicinity freeways are wholly outside the City of Shasta Lake's jurisdiction and the City cannot be certain that mitigation will be made. Therefore, this impact would be **cumulatively considerable** and **significant and unavoidable**.

Conflict with Applicable Ramp Junction Level of Service – Cumulative Year 2020 Plus Project Conditions

Impact 4.3.11 Implementation of the proposed project would result in an increase in traffic volumes on vicinity freeway ramp junctions under Year 2020 Plus Project conditions that would exacerbate unacceptable level of service. While the imposition of mitigation would reduce this impact, vicinity freeway ramp junctions are wholly outside the City of Shasta Lake's jurisdiction and the City cannot be certain that mitigation will be made. Therefore, this impact would be **cumulatively considerable** and **significant and unavoidable**.

Conflict with Applicable Level of Service Due to Wonderland Boulevard Extension – Cumulative 2020 Plus Project Conditions

Impact 4.3.12 Implementation of the Wonderland Boulevard southern access extension conceptualized under the proposed project would result in an exceedence of level of service thresholds under Year 2020 Plus Project conditions. This impact would be **cumulatively considerable** and **significant and unavoidable**.

Conflict with Applicable Intersection Level of Service – Cumulative Year 2030 Plus Project Conditions

Impact 4.3.13 Under Year 2030 Plus Project conditions, all study area intersections would meet level of service standards with the imposition of mitigation. However, six study intersections are wholly outside the City of Shasta Lake's jurisdiction and the City cannot be certain that mitigation will be made. Therefore, this impact would be **cumulatively considerable** and **significant and unavoidable**.

6.0 OTHER EVALUATIONS REQUIRED BY CEQA

Conflict with Applicable Freeway Mainline Segment Level of Service – Cumulative Year 2030 Plus Project Conditions

Impact 4.3.15 Implementation of the proposed project would result in an increase in traffic volumes on vicinity freeways that would operate below level of service thresholds under Year 2030 Plus Project conditions. While the imposition of mitigation would reduce this impact, vicinity freeways are wholly outside the City of Shasta Lake's jurisdiction, and the City cannot be certain that mitigation will be made. Therefore, this impact would be **cumulatively considerable** and **significant and unavoidable**.

Conflict with Applicable Ramp Junction Level of Service – Cumulative Year 2030 Plus Project Conditions

Impact 4.3.16 Implementation of the proposed project would result in an increase in traffic volumes on vicinity freeway ramp junctions under Year 2030 Plus Project conditions that would exacerbate unacceptable level of service. While the imposition of mitigation would reduce this impact, vicinity freeway ramp junctions are wholly outside the City of Shasta Lake's jurisdiction, and the City cannot be certain that mitigation will be made. Therefore, this impact would be **cumulatively considerable** and **significant and unavoidable**.

Conflict with Applicable Level of Service Due to Wonderland Boulevard Extension – Cumulative Year 2030 Plus Project Conditions

Impact 4.3.17 Implementation of the Wonderland Boulevard southern access extension conceptualized under the project would result in an exceedence of level of service thresholds under Year 2030 Plus Project conditions. This impact would be **cumulatively considerable** and **significant and unavoidable**.

AIR QUALITY

Short-Term Construction Generated Pollutant Emissions Resulting in Violation of Air Quality Standards or Contributing to Existing Violations

Impact 4.4.2 Construction activities such as clearing, excavation and grading operations, construction vehicle traffic, and wind blowing over exposed earth would generate exhaust emissions and fugitive particulate matter emissions that would temporarily affect local air quality for adjacent land uses. This will result in a **significant and unavoidable** impact.

Long-Term Operational Emissions of Air Pollutants Resulting in Violation of Air Quality Standards or Contributing to Existing Violations

Impact 4.4.3 Project-generated operational emissions would exceed applicable significance thresholds and could contribute to regional nonattainment conditions. This impact would be **significant and unavoidable**.

Contribution to Net Increase of Air Pollutants for Which the NSVAB Is Nonattainment

Impact 4.4.6 Long-term operation of the project would result in increased emissions of ozone-precursor pollutants and PM₁₀ that would exceed applicable

significance thresholds and could contribute to future concentrations of ozone and PM₁₀, for which the region is currently designated nonattainment. This impact would be considered **cumulatively considerable** and **significant and unavoidable**.

NOISE

Compatibility of Proposed Land Uses with Projected On-Site Noise Levels

Impact 4.5.4 Projected on-site transportation noise levels at nearby proposed on-site development would exceed the City's noise sensitivity standards for land use compatibility. As a result, this impact would be considered **significant and unavoidable**.

BIOLOGICAL RESOURCES

Cumulative Oak Woodland Impacts

Impact 4.6.9 Buildout of the proposed project will result in the loss of oak woodland habitat. This impact is **cumulatively considerable** and **significant and unavoidable**.

Utilities and Service Systems

Available Water Supplies to Serve the Project

Impact 4.10.1.1 Buildout of the project would require the use of water supplies, which may exceed the City of Shasta Lake's current water allotment during drought conditions. This impact is considered **significant and unavoidable**.

Cumulative Water Supply

Impact 4.10.1.3 Implementation of the proposed project, in combination with cumulative development, would increase the current demand for water supply service. This impact is considered to be **cumulatively considerable and significant and unavoidable**.

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APPENDICES

The appendices are provided on a CD located on the back cover.

