Sonoma County General Plan 2020
Draft Environmental Impact Report

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January 2006

SONOMA COUNTY GENERAL PLAN 2020
DRAFT ENVIRONMENTAL IMPACT REPORT

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1.0 INTRODUCTION

1.0 INTRODUCTION

This Draft Environmental Impact Report (EIR) describes the potential environmental effects that could result from implementation of the proposed Sonoma County General Plan 2020 (*Draft GP 2020*), which provides policy guidelines for the unincorporated portions of Sonoma County to direct growth and development to the year 2020.

The *State CEQA Guidelines* charge public agencies with the responsibility of avoiding or minimizing environmental damage where feasible. As part of this responsibility, public agencies are required to balance various public objectives, including economic, environmental, and social issues. An EIR is integral to that process, informing decision-makers and the general public what significant effects might result from a proposed project. In addition, the document identifies possible means of minimizing any significant effects and presents reasonable alternatives to the project. In making its decision about the project, the lead agency, in this case Sonoma County, must consider the information in this EIR along with any other available information.

1.1 EIR REQUIREMENT

Environmental review in compliance with the California Environmental Quality Act (CEQA) is required as part of the County's consideration of the *Draft GP 2020*. An Initial Study, completed by Sonoma County on January 3, 2003, confirmed the need for an EIR and determined the topics for analysis (also called impact areas). The Initial Study is included in ***Appendix 7.4 Initial Study***. The Initial Study identified the following areas as potentially being significantly impacted by the project:

- Land Use, Population, and Housing
- Transportation
- Air Quality
- Noise
- Hydrology and Water Resources
- Biological Resources
- Geology / Soils
- Agriculture
- Public Services
- Cultural Resources
- Visual Resources
- Energy
- Hazardous Materials

In compliance with CEQA, Sonoma County sent a Notice of Preparation (NOP) on January 7, 2003 to government agencies, special service districts, organizations, and individuals with an interest in or jurisdiction over the project. This step ensured early consultation on the scope of the EIR. The comment period lasted for 30 days after receipt of the NOP, at which point the Permit and Resource Management Department (PRMD) scheduled a public scoping meeting for the project, which was held on January 21, 2003. [1]

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[1] The NOP and responses to the NOP are available at the Sonoma County Permit and Resource Management Department, 2550 Ventura Avenue, Santa Rosa CA, 95403.

The Draft EIR has been prepared in accordance with the California Environmental Quality Act, including the *CEQA Statutes* (Public Resources Code §§ 21000-21178.1), *State CEQA Guidelines*, and relevant court decisions.

A PROGRAM EIR

CEQA distinguishes between project and program EIRs, defining a program EIR as one that addresses a series of actions that can be characterized as one large project and can be related

- Geographically;
- As logical parts in the chain of contemplated actions;
- In connection with the issuance of rules, regulations, plans, or other general criteria to govern the conduct of a continuing program; or
- As individual activities carried out under the same authorizing statutory or regulatory authority and having generally similar environmental effects that can be mitigated in similar ways.

The *Sonoma County GP 2020 Draft EIR* is a program EIR under Section 15168 of the *State CEQA Guidelines* and evaluates the environmental impacts of the proposed project on a general level rather than a project-specific level. Its analysis is considered the first tier of environmental review, creating the foundation on which future, project-specific CEQA documents can build. A program EIR can be incorporated by reference into subsequently prepared environmental documents to address issues such as cumulative impacts and growth inducing impacts, allowing the subsequent documents to focus on new or site-specific impacts.

The General Plan policies take into account many of the impacts and mitigation measures discussed in this EIR, so that the new plan effectively becomes self-mitigating for many impacts. The EIR was prepared under the direction of the County of Sonoma and is provided for review by the public and by public agencies, as required. The Final EIR must be certified by the Board of Supervisors prior to adoption of the General Plan. Due to the programmatic nature of the General Plan, this EIR has been prepared as a "program" EIR. As described in CEQA Guidelines § 15168(a)(3), a program EIR "may be prepared on a series of actions that can be characterized as one large project and are related...in connection with the issuance of rules, regulations, plans, or other general criteria to govern the conduct of a continuing program." As a program EIR, this document focuses on the overall effect of the General Plan. This analysis does not examine the effects of site specific projects that may occur within the overall umbrella of this program in the future. The nature of general plans is such that many proposed policies are intended to be general, with details to be worked out during implementation. Thus, many of the impacts and mitigation measures can only be described in general or qualitative terms.

1.2 EIR OBJECTIVITY

In accordance with CEQA, this EIR:

- Assesses the expected impacts of the ultimate environmental changes resulting from the planned population, housing, and employment growth and implementation of the policies in the *Draft GP 2020;*

- Identifies mitigation measures that could avoid or minimize potentially significant environmental impacts; and

- Evaluates alternatives to the proposed project

If an EIR determines that there will be significant impacts as the result of a project, agencies with authority over the project must make one or more of the following findings:

- Changes have been required in the project that would avoid or substantially reduce significant impacts;

- Such changes are the responsibility of another public agency; or

- Specific economic, social, or other considerations make the mitigation measures of the EIR or project alternative(s) infeasible.

After considering the Final EIR, the lead agency shall not approve a project unless all significant effects have been eliminated or reduced where feasible or the agency adopts a statement of overriding considerations finding that economic, legal, social technological or other benefits of the proposed project outweigh its unavoidable adverse environmental effects.

The EIR is a factual, objective, public-disclosure document that takes no position on the merits of the project, but rather provides information on which decisions about the project can be based. The EIR has been prepared according to the professional standards and practices of the EIR consultants' individual disciplines and in conformance with the legal requirements and informational expectations of CEQA and the State and local guidelines in place to implement it. EIR authors are listed in ***Appendix 7.1 Report Preparers***.

1.3 INFORMATION USED TO PREPARE THE EIR

The *State CEQA Guidelines* permit any person to submit information to assist in the preparation of an EIR, but require independent review of the information to ensure that it accurately reflects the lead agency's judgment about the environmental impacts of the project. In addition, Sonoma County hosted a significant Citizens' Advisory Committee (CAC) process over a period of several years in preparing the *Draft GP 2020*. In addition to the CAC, there were several subcommittees addressing a range of issues including Riparian Corridors/Biological Habitat, Agricultural Tourism, Agricultural Processing and Support Services, Water Resources, and Circulation. Public input at these meetings and staff findings were summarized in staff reports that list all the issues raised and their outcomes. As part of this process, independent consultants have also prepared reports on various impact areas that were used in the preparation of this document. Sources listed below are also referenced in ***Appendix 7.3 Bibliography***.

Sonoma County General Plan 2020 Public Hearing Draft

This is the document analyzed in this EIR. This document is referenced in this Draft EIR as the *Draft GP 2020*. See ***Chapter 3.0 Project Description*** for a complete description of this document.

Sonoma County General Plan, March 23, 1989 as amended

This is the existing general plan for Sonoma County. This document is referenced in this Draft EIR as the existing *General Plan*. This document is currently used by the County staff to guide development within the unincorporated portion of the county.

Final EIR Sonoma County General Plan, March 1989

This document analyzes the potential impacts of the existing *General Plan.* It includes the December 1986 Draft EIR and the responses to comments on the Draft EIR.

1.4 PUBLIC REVIEW AND COMMENT

Copies of the Sonoma County General Plan 2020 Public Hearing Draft and this Draft EIR are available through the Sonoma County Permit and Resource Management Department and online at www.sonoma-county.org. Sonoma County will also circulate the document to public agencies, relevant organizations and interested individuals.

Comments may be submitted in writing or orally at a public hearing to be held by the Sonoma County Planning Commission. Comments should be focused on the adequacy and completeness of the EIR or should address questions about the environmental consequences of project implementation. In this case, "adequacy" is defined as the thoroughness of the EIR in addressing significant environmental effects, identifying mitigation measures for those impacts, and supplying enough information for public officials to make decisions about the merits of the project. In order to keep the documents succinct and useful as decision-making tools, the *State CEQA Guidelines* charge that EIRs focus on a project's significant impacts and not address every imaginable less-than-significant effect.

Comments on the Draft EIR must be made before the close of the public review period and sent or delivered to:

Sonoma County Permit and Resource Management Department
Attn: Bob Gaiser
2550 Ventura Avenue
Santa Rosa, CA 95403-2829

Comments can be sent by email to: Bgaiser@sonoma-county.org

After the close of the public review period, a Final EIR will be prepared that contains all the comments received by the County during the public review period and responses to those comments. This document will be made available to public agencies and the general public so those parties can review the Final EIR before the County certifies it as complete.

No action can be taken on the *Draft GP 2020* until the Final EIR is certified; however, County acceptance of the EIR upon certification does not signal or require approval of the project studied.

1.5 AGENCIES EXPECTED TO USE THE EIR

Sonoma County, in addition to updating its own General Plan, is also affected by plans made for the area by federal, State, regional, and other local agencies. It is important for the success of any plan

that it be coordinated with other organizations making plans for the same area. This is especially true in Sonoma County where several important services, such as water supply, sewage treatment, and regional freeways, are the primary responsibility of other agencies. These agencies may include, but are not limited to, the following:

Federal Agencies

- U.S. Environmental Protection Agency
- U.S. Federal Aviation Administration
- U.S. Army Corps of Engineers
- U.S. Fish and Wildlife Service

State Agencies

- California Air Resources Board
- California Board of Forestry
- California Department of Transportation (Caltrans District 4)
- California Coastal Commission
- California Department of Conservation
- California Department of Fish and Game
- California Department of Forestry
- California Department of Health Services
- California Division of Mines and Geology
- California Department of Parks and Recreation
- California Public Utilities Commission
- California State Water Resources Control Board (North Coast Region)
- California Resources Agency
- California States Lands Commission
- California Resources Agency

Regional Agencies

- Association of Bay Area Governments
- Sonoma County Transportation Authority
- Bay Area Air Quality Management District
- San Francisco Bay Conservation and Development Commission
- Marin-Sonoma Mosquito Abatement District
- Metropolitan Transportation Commission
- Northern Sonoma County Air Pollution Control District
- Sonoma-Marin Area Rail Transit District
- Golden Gate Bridge, Highway and Transportation District
- Sonoma County Local Agency Formation Commission (LAFCO)
- North Coast Regional Water Quality Control Board
- Bay Area Regional Water Quality Control Board

Local Agencies

- City of Cloverdale
- City of Cotati
- City of Healdsburg
- City of Petaluma

- City of Rohnert Park
- City of Santa Rosa
- City of Sebastopol
- City of Sonoma
- Town of Windsor
- Water Supply Agencies (including the Sonoma County Water Agency, Bodega Bay Public Utilities District, Sea Ranch Water Company, Occidental Water Company, Geyserville Water Works, Forestville Water District, Sweetwater Springs Water District in the Russian River area, City of Santa Rosa Department of Public Utilities in the urban South Park area, the Town of Windsor in the Airport Industrial Area, California American Water in the Larkfield-Wikiup area, the Penngrove Water Company, and the Valley of the Moon Water District in Sonoma Valley.
- Wastewater Management Agencies (including the Sonoma County Water Agency)
- Numerous school districts (31 elementary districts, three high school districts and six unified districts)

1.6 REPORT ORGANIZATION

After this introduction, the EIR is organized into the following sections.

Chapter 2.0 – Summary of Findings

Outlines the proposed project and provides, in table format, a listing of the impacts, mitigation, and level of significance after mitigation.

Chapter 3.0 – Project Description

Describes the project in greater detail, provides an overview of the general plan update process and objectives, discusses the relationship of the *Draft GP 2020* to other area and regional plans, and introduces the growth projections.

Chapter 4.0 – Environmental Setting, Impacts, and Mitigation Measures

Provides the environmental analysis for each of the 13 impact areas, listing the setting and relevant *Draft GP 2020* policies, environmental impacts, levels of significance, mitigation measures, and level of significance after mitigation.

Chapter 5.0 – Alternatives

Discusses the project alternatives and their associated environmental impacts.

Chapter 6.0 – Impact Overview

Beyond the impact discussion in ***Chapter 4.0***, this chapter lists growth-inducing impacts, cumulative impacts, significant unavoidable impacts, and significant irreversible environmental changes.

Chapter 7.0 – Appendices

All appendices to the EIR, including the Initial Study.

2.0 SUMMARY OF FINDINGS

2.0 SUMMARY OF FINDINGS

This chapter summarizes the findings of this Draft EIR. It highlights the project's effects, identifies the alternatives studied, and presents the impact overview discussions required by the California Environmental Quality Act (CEQA).

2.1 PROPOSED PROJECT

Sonoma County's existing *General Plan* was adopted in 1989 after three and a half years of work and over two years of public hearings. The plan established nine major planning goals as the basic framework of its goals, objectives, and policies. These nine major goals are contained in the Land Use Element of the existing *General Plan* and relate to the following subjects:

- Growth projections and growth policy;
- City and community centered growth;
- Compact city and community boundaries;
- Phasing of rural and urban growth with availability of adequate services;
- Open space separation between cities / communities;
- Opportunities for diverse rural and urban residential environments;
- Use of environmental suitability criteria to locate urban and rural growth;
- Protection of agricultural lands; and
- Preservation of scenic features and biotic resource areas.

The overall objective of the *GP 2020* is to review and consider policy changes only on selected topics or issues. These policies and issues were established by the Board of Supervisors following extensive public input and recommendations of the Citizen's Advisory Committee, appointed by the Board. The community at large, and the Citizen's Advisory Committee, felt strongly that the existing *General Plan* was functioning well as the County's land use guide. As a result, the *Draft GP 2020* continues to follow the existing *General Plan* land use maps and its major goals so that the policies that are reviewed and revised are in keeping with these goals.

The *Draft GP 2020* is organized into ten elements as follows:

- Land Use
- Housing
- Agricultural Resources
- Open Space and Resource Conservation
- Water Resources
- Public Safety
- Circulation and Transit
- Air Transportation
- Public Facilities and Services
- Noise

This EIR evaluates policies and programs of the *Draft GP 2020* that would lead to alterations in the physical environment. The evaluation includes changes in population, housing, and land use patterns that would occur in Sonoma County as the *GP 2020* is implemented. The project encompasses all of the future land uses and development that are projected to occur, including residential, commercial, industrial, agricultural, and other land uses and development, as well as the entire foreseeable public infrastructure that is necessary to serve the projected uses. The *Draft GP 2020* is based upon a projected amount of growth, and does not assume that all properties would be fully developed.

The *Draft GP 2020* projects that the population in Sonoma County would increase from 458,614 in 2000 to 546,030 residents in 2020; an increase of 87,416 residents. This would place 73 percent of Sonoma County's total population in the nine cites. In the unincorporated area of Sonoma County, population would increase from 128,596 in 2000 to 147,660 residents in 2020; an increase of 19,064 residents. Population in the unincorporated area would account for 27 percent of the total county population.

The *Draft GP 2020* projects the number of housing units in Sonoma County would increase from 183,153 in 2000 to 221,640 in 2020; an increase of 38,487 housing units. Of this growth, the *Draft GP 2020* projects a housing unit increase in the nine cities of 31,143 to 157,851 between 2000 and 2020. Such growth would place 71 percent of Sonoma County's housing units within the cities. Growth in the unincorporated area between 2000 and 2020 is projected to reach 63,789 housing units; an addition of 7,344 housing units. Housing units in the unincorporated area would account for 29 percent of the total number of county housing units.

Adoption of the *GP 2020* would also affect the County's Zoning Code and zoning applied to selected properties. Code changes are proposed concurrent with the *GP 2020* that would apply to the following:

- ***Air Transportation Element*** – An Overlay Zoning District is proposed to be created and applied to properties surrounding the public use airports in the county for the purpose of increased protection of the airport environs from incompatible uses.

- ***Affordable Housing Sites*** – An Overlay Zoning District is proposed to be created and applied to selected properties in Urban Service Areas in order to implement a program in the adopted Housing Element.

- ***Land Use Changes*** – Zoning is proposed to be changed on certain properties to conform to any land use map amendments that are approved as part of the *GP 2020*.

- ***Zoning Code and Map Changes*** would also be required following the adoption of the *GP 2020* in order for the Code to be consistent with the updated General Plan. Designation of Community Separators, Scenic Landscape Units, Biotic Resource Areas, and text amendments to implement policies regarding energy resources, rural and urban development guidelines, siting of churches and schools, etc. are examples.

A more detailed description of the proposed project and background information are contained in ***Chapter 3.0 Project Description***.

2.2 AREAS OF CONTROVERSY

Sonoma County prepared a Notice of Preparation (NOP) in January 2003 and sent it to governmental agencies, special service districts, organizations, and individuals with an interest in or jurisdiction over the project in order to provide early consultation on the scope of the EIR. Several letters were received in response to the NOP. After reviewing comments relevant to the *Draft GP 2020*, the County identified the following areas of controversy that are further evaluated in this Draft EIR:

Land Use, Population, and Housing – Impact of projected growth and development on the existing land use patterns in the county.

Transportation – Impact of the proposed land use on the county's transportation system. Of particular concern is the change in existing levels of service on the county's roadway system with projected growth of the *GP 2020*.

Air Quality – Consistency with the population / employment assumptions used in the development of the Clean Air Plans and consistency with the regional Transportation Control Measures.

Noise – Concern with increased noise due to increased traffic and impacts to noise sensitive development.

Hydrology and Water Resources – Impact on surface water and groundwater quality, bank erosion and sedimentation, flooding, and the management of water supplies.

Biological Resources – Impact on county's biological and wetland resources – especially sensitive natural communities, special-status species, and riparian corridors.

Geology / Soils – Assess potential geologic, seismic, ands soil impacts of the *Draft GP 2020*.

Agriculture – Potential conversion of agricultural land uses to non-agricultural uses, including the conversion of timberland to other uses.

Public Services – Assess whether projected land uses and development consistent with the *Draft GP 2020* would result in the demand for pubic services such that new facilities would need to be constructed and identify associated environmental impacts.

Cultural Resources – Impact to historical and cultural resources in Sonoma County.

Visual Resources – Impacts to visual resources and aesthetic character of Sonoma County, including potential development on the county's scenic resources and rural character.

Hazardous Materials – Potential use of hazardous materials and the treatment and disposal of hazardous waste in the county.

2.3 SIGNIFICANT IMPACTS AND MITIGATION MEASURES

This Draft EIR considers the projected development related to the *GP 2020* and assesses the effects of implementing the project alone and combined with other cumulative development expected in the vicinity. **Exhibit 2.0-1** summarizes the environmental impacts identified in ***Chapter 4.0 Environmental Setting, Impacts, and Mitigation Measures*** where the impacts are discussed in detail.

The following levels of significance were used to identify impacts in **Exhibit 2.0-1** and elsewhere in this Draft EIR.

- ***Significant Impact (S)*** – an adverse change in the environment, where the change exceeds a specific significance threshold. These thresholds are described under the "Significance Criteria" in sections 4.1 through 4.13.

- ***Significant Unavoidable Impact (SU)*** – A significant impact which cannot be avoided with mitigation. These include impacts which could be partly mitigated but could not be reduced to a less-than-significant level.

- ***Less-than-Significant Impact (LTS)*** – a change in the environment that does not exceed specific significance thresholds, or no change at all.

Topical sections in ***Chapter 4.0 Environmental Setting, Impacts, and Mitigation Measures*** list the thresholds and criteria used to determine significance for the respective environmental subject.

Exhibit 2.0-1
Summary of Findings

Impact	*Significance Before Mitigation*	*Mitigation*	*Significance After Mitigation*
Land Use, Population and Housing			
4.1-1 Growth and Concentration of Population Implementation of the *Draft GP 2020* would induce growth of population within the unincorporated portion of Sonoma County by accommodating new housing and businesses and by providing services and infrastructure capacity.	LTS	No mitigation would be required.	LTS
4.1-2 Land Use Conflicts between Agricultural and Residential / Urban Uses Implementation of the *Draft GP 2020* would result in the intrusion of residential uses into agricultural areas thereby exposing residents to noise, odors, dust, and similar nuisances associated with agricultural operations. Such residential development may be incompatible with agricultural operations. Urban uses at the fringe of cities and the unincorporated communities may also encounter these agricultural operations. Both residential intrusion and urban uses at the fringe may result in land use conflicts and land use incompatibility. While the *Draft GP 2020* and the Sonoma County Code contain policies and ordinances to reduce this impact, this would be a significant impact.	S	No mitigation available beyond the *Draft GP 2020* policies.	SU
4.1-3 Incompatible Land Uses in the Rural Area Land uses and development consistent with the *Draft GP 2020* would result in changes in land use type, density, and scale within rural areas and generate land use incompatibilities. While policies and programs contained in the *Draft GP 2020* would reduce such incompatibilities, this would be a significant impact.	S	No mitigation available beyond the *Draft GP 2020* policies.	SU

Impact	*Significance Before Mitigation*	*Mitigation*	*Significance After Mitigation*
4.1-4 Affordable Housing Development of affordable housing projects consistent with the *Draft GP 2020* may be incompatible with established land uses adjacent to the proposed locations.	LTS	No mitigation would be required.	LTS
Transportation			
4.2-1 Congestion on Local County and City Roadway Segments Land uses and development consistent with the *Draft GP 2020*, the cities, and implementation of proposed transportation improvements would result in unacceptable LOS along several local city and county roadways.	S	***Adobe Road, west of Corona Road and east of Frates Road*** 4.2-1(a) Revise Policy **CT-6l** of the Circulation and Transit Element (Rohnert Park / Cotati Planning Area) as follows: **Policy CT-6l**: Utilize the County traffic model as a foundation to prepare a detailed operational analysis of roads and streets in the Penngrove community, to identify specific traffic calming improvements within the community, and to route traffic to the Highway 101 and rail corridor. As part of this study, consider expanding the area designated for traffic calming to include the remainder of Adobe Road from Sonoma Mountain Road to Frates Road. Also consider improvements to the intersections of Adobe / Corona Roads and Adobe / Frates Roads that would reduce congestion along Adobe Road where consistent with the designated road classifications. Develop a phasing mechanism for these improvements that provides for completion of traffic calming improvements on designated roadways in the community prior to improvement of other roads that accommodate through traffic. ***Arnold Drive north of Watmaugh Road and north of Verano Avenue*** 4.2-1(b) Add a new policy to the Circulation and Transit Element (Sonoma Valley Planning Area) as follows: **Policy CT-6xx**: Consider intersection improvements such as signalization and left turn lanes at various intersections along Arnold Drive to reduce congestion, provided that the improvements are consistent with the designated road classifications.	SU SU

Impact	Significance Before Mitigation	Mitigation	Significance After Mitigation
4.2-1 Congestion on Local County and City Roadway Segments (cont.) Land uses and development consistent with the *Draft GP 2020*, the cities, and implementation of proposed transportation improvements would result in unacceptable LOS along several local city and county roadways.	S	***Guerneville Road, east of Frei Road*** 4.2-1(c) Add a new policy to the Circulation and Transit Element (Russian River Planning Area) as follows: **Policy CT-6yy**: Consider increased access management along Guerneville Road between Highway 116 and the Santa Rosa city limits to preserve through-traffic carrying capacity, provided that the improvements are consistent with the designated road classifications.	SU
		Main Street between Old Redwood Highway and Adobe Road, through the community of Penngrove 4.2-1(d) No Mitigation available beyond the *Draft GP 2020* policies discussed in the impact analysis.	SU
		Petaluma Boulevard north of Skillman Lane 4.2-1(e) Recommended mitigation would include signalization and turning lane intersection improvements, lengthening turning pockets, access management, and signal modifications.	SU
		Petaluma Hill Road from Adobe Road to the Santa Rose City Limits 4.2-1(f) Add a new policy to the Circulation and Transit Element (Rohnert Park/Cotati Planning Area) as follows: **Policy CT-6zz**: Consider intersection improvements and restrictions, turning lanes, and signalization along Petaluma Hill Road to reduce congestion, provided that the improvements are consistent with the designated road classifications.	SU
		Rohnert Park Expressway from Stony Point Road to the Rohnert Park City Limits 4.2-1(g) Add a new policy to the Circulation and Transit Element (Rohnert Park/Cotati Planning Area) as follows: **Policy CT-6aaa**: Consider additional turning lanes at the intersection of Rohnert Park Expressway and Stony Point Road to reduce congestion on the Rohnert Park Expressway.	SU
		Traffic in the Cities 4.2-1(h) No additional mitigation is available.	SU

Impact	Significance Before Mitigation	Mitigation	Significance After Mitigation
4.2-2 Congestion on State Highways Land uses and development consistent with the *Draft GP 2020* and implementation of proposed transportation improvements would result in unacceptable LOS along several locations on State Highways.	S	***Highway 12 in Several Locations Primarily in the Sonoma Valley*** 4.2-2 (a) Add a new policy to the Circulation and Transit Element (Russian River, Santa Rosa, and Sonoma Valley Planning Areas) as follows: **Policy CT-6bbb**: Work with Caltrans in considering signalization, turning lanes, passing lanes, and other traffic management improvements along Highway 12 to reduce congestion, provided that the improvements are consistent with the designated road classifications. ***Highway 37 in Several Locations*** 4.2-2(b) Add a new policy to the Circulation and Transit Element (Petaluma and Sonoma Valley Planning Areas) as follows: **Policy CT-6ccc**: Work with Caltrans in considering turning lanes, access controls, and other traffic management improvements along Highway 37 to reduce congestion, provided that the improvements are consistent with the designated road classifications. ***Highway 116 East of Adobe Road (Petaluma Planning Areas) and west of Stony Point Road (Rohnert Park – Cotati Planning Area)*** 4.2-2(c) Add a new policy to the Circulation and Transit Element (Sebastopol, Russian River, Santa Rosa, Petaluma and Sonoma Valley Planning Areas) as follows: **Policy CT-6ddd**: Work with Caltrans in considering passing and turning lanes along Highway 116 to reduce congestion, provided that the improvements are consistent with the designated road classifications. ***Highway 121 South of Highway 116 in the Southern Sonoma Valley*** 4.2-2(d) Add a new policy to the Circulation and Transit Element (Sonoma Valley Planning Area) as follows: **Policy CT-6eee**: Work with Caltrans in considering intersection improvements at Highways 116 and 121 and passing lanes, and access management along Highway 121 to reduce congestion, provided that the improvements are consistent with the designated road classifications.	SU SU SU SU

Impact	***Significance Before Mitigation***	***Mitigation***	***Significance After Mitigation***
4.2-3 Congestion on Portions of US 101 in Several Areas between Cotati to north of Windsor Land uses and development consistent with the *Draft GP 2020* and implementation of proposed transportation improvements would result in unacceptable LOS along portions of US 101.	S	4.2-3(a) Revise Policy **CT-3f** of the Circulation and Transit Element as follows: **Policy CT-3f**: In conjunction with SCTA and Caltrans, designate and design freeways as limited access highways that carry large volumes of interurban, regional, and interstate traffic, and carry local traffic in urban areas. The following policies apply to designated freeways: Sub-policy items 1-4 do not change (5) Consider additional traffic management actions such as ramp metering, auxiliary lanes, the Bay Area Traffic Operations System, and the Freeway Service Patrol.	SU
4.2-4 Congestion at Key Intersections throughout the County Land uses and development consistent with the *Draft GP 2020* and implementation of proposed transportation improvements would result in unacceptable LOS at several key intersections.	S	4.2-4(a) Mitigation measures may include changing the timing of the signal controller; adding or modifying signal phases; and / or re-striping, lengthening, or constructing new lanes. In some areas, right of way is constrained, or intersections are in environmentally sensitive areas, limiting the ability to construct new lanes. Specific mitigation measures would be selected as individual projects are planned.	SU
4.2-5 Increased Demand for Transit Services Implementation of the *Draft GP 2020* would result in increased demand for transit services. Implementation of policies included in the *Draft GP 2020* would result in improvements in transit services.	LTS	No mitigation would be required.	LTS
4.2-6 Air Traffic Safety Land uses and development consistent with the *Draft GP 2020* could be subject to safety risks from air traffic at the county's six airports. However, existing regulations and policies contained in the *Draft GP 2020* would reduce this to a less-than-significant impact.	LTS	No mitigation would be required.	LTS

Impact	Significance Before Mitigation	Mitigation	Significance After Mitigation
4.2-7 Conflict with Alternative Transportation Land uses and development consistent with the *Draft GP 2020* could conflict with adopted plans, policies, and programs supporting alternative transportation modes, such as bicycle, pedestrian, rail, and other modes of travel. However, proposed policies in the *Draft GP 2020* would reduce this to a less-than-significant impact.	LTS	No mitigation would be required.	LTS
4.2-8 Lack of Parking Capacity or Emergency Access Land uses and development consistent with the *Draft GP 2020* could result in safety hazards or lack of emergency services due to inadequate parking and / or insufficient access for emergency vehicles. However, existing regulations and proposed policies in the *Draft GP 2020* would reduce this to a less-than-significant impact.	LTS	No mitigation would be required.	LTS
4.2-9 Safety Risk from Transportation System Design Land uses and development consistent with the *Draft GP 2020* could result in an increase in safety hazards associated with transportation design features or with incompatible uses of the road system. However, existing regulations and proposed policies in the *Draft GP 2020* would reduce this to a less-than-significant impact.	LTS	No mitigation would be required.	LTS
Air Quality			
4.3-1 Increased Emissions of Ozone Precursors Land uses and development consistent with the *Draft GP 2020* would result in increased emissions of ozone precursors resulting primarily from vehicles. The increase of emissions within the NSCAPCD would be a less-than-significant impact. However, within the jurisdiction of the BAAQMD, the increased emissions would exceed the District's Clean Air Plan (CAP) thresholds.	S	4.3-1 Add a new policy to the Open Space and Resource Conservation Element as follows: **Policy OSRC-16h**: Require that development within the Bay Area Air Quality Management District that generates high numbers of vehicle trips, such as shopping centers and business parks, to incorporate air quality mitigations in their designs.	SU

Impact	Significance Before Mitigation	Mitigation	Significance After Mitigation
4.3-2 Increased Particulate Emissions Residential construction consistent with the *Draft GP 2020* would result in increased wood-burning. Construction activities consistent with the *Draft GP 2020* would result in emissions of dust and other air pollutants.	LTS	No mitigation would be required.	LTS
4.3-3 Exposure to Odors / Toxic Air Contaminants Land uses and development consistent with the *Draft GP 2020* could emit odors and toxic contaminants that could affect nearby land uses. In addition, occupants of certain land uses proposed near major transportation corridors could be exposed to toxic air contaminants.	S	4.3-3(a) Add a new policy to the Open Space and Resource Conservation Element as follows: **Policy OSRC-16k:** Ensure that any proposed new sources of toxic air contaminants or odors would provide adequate buffers to protect sensitive receptors and comply with existing health standards. Require consideration of odor impacts when evaluating discretionary land uses and development projects near wastewater treatment plants, or treatment plant expansion projects. Promote land use compatibility for new development by using buffering techniques such as landscaping, setbacks, and screening in areas where such land uses abut one another. 4.3-3(b) Add a new policy to the Open Space and Resource Conservation Element as follows: **Policy OSRC-16l**: Require that discretionary projects involving sensitive receptors (facilities or land uses that include members of the population sensitive to the effects of air pollutants, such as children, the elderly and people with illnesses) proposed near the US 101 corridor should include an analysis of mobile source toxic air contaminant health risks. Project review should include an evaluation of the adequacy of the setback from the highway and, if necessary, identify design mitigation measures to reduce health risks to acceptable levels.	LTS
4.3-4 Exposure to Industrial Diesel Truck Emissions Industrial, mineral-extraction, and other land uses and development that generate diesel truck trips could result in exposures of people to diesel particulate (a Toxic Air Contaminant).	S	4.3-4 Add a new policy to the Open Space and Resources Conservation Element as follows: **Policy OSRC-16m**: Work with the BAAQMD and NSCAPCD to adopt a diesel particulate ordinance regulating land uses that generate diesel vehicle trips. The ordinance should establish trip-based thresholds that trigger mitigation requirements either through source reduction or payment of a mitigation fee to off-set a project's impact in the same geographical area, and provide for periodic review to account for long-term changes in emission rates from diesel trucks.	LTS

Impact	Significance Before Mitigation	Mitigation	Significance After Mitigation
4.3-5 Aircraft Emissions Air operations at Sonoma County airports consistent with levels projected by the *Draft GP 2020* Air Transportation Element, could result in increased emissions in the region. These emissions are already included in the emission inventory that is the basis for regional air quality plans and thus are not expected to impede attainment or maintenance of ambient air quality standards.	LTS	No mitigation would be required.	LTS
Noise			
4.4-1 Increased Traffic Noise Land uses and development consistent with the *Draft GP 2020* would result in increased traffic which in turn would result in a substantial increase in noise along certain roadway segments.	S	4.4-1 Revise Policy **NE-2b** to encourage sound barriers along roadways in areas where significant noise sensitive land uses, such as hospitals and schools, exist. Revise Policy **NE-2b** as follows: **Policy NE-2b**: Encourage installation of sound barriers along roadways in non-industrial urban areas where an exterior noise level of 65 dB Ldn or more is attained and residences or other noise sensitive uses exist. Encourage installation of sound barriers adjacent to roadways in other areas where significant noise sensitive land uses exist.	SU
4.4-2 Impact to Noise Sensitive Development from Roadway Noise Future noise sensitive development could expose new sensitive receptors to roadway noise levels greater than those considered normally acceptable.	LTS	No mitigation would be required.	LTS
4.4-3 Increased Rail Noise Existing noise sensitive land uses could be exposed to substantially increased noise levels from rail activity.	S	4.4-3 No mitigation would be available to the County beyond the *Draft GP 2020* policies. Mitigation of noise impacts resulting from the implementation of the SMART rail project would be the responsibility of the SMART District.	SU
4.4-4 Impact to Noise Sensitive Development from Stationary Noise Sources Existing and future noise sensitive development could be exposed to increased noise levels from new noise generating development greater than those considered normally acceptable.	LTS	No mitigation would be required.	LTS

Impact	Significance Before Mitigation	Mitigation	Significance After Mitigation
4.4-5 Airport Noise Air operations at Sonoma County airports consistent with levels projected by the *Draft GP 2020* Air Transportation Element could result in increased noise levels to surrounding areas including residential land uses. However, policies and programs contained in the *Draft GP 2020* Noise and Air Transportation Elements would reduce this to a less-than-significant impact.	LTS	No mitigation would be required.	LTS
Hydrology and Water Resources			
4.5-1 Water Quality – Residential, Commercial, Industrial, and Public Uses Residential, commercial, industrial, and public uses consistent with the *Draft GP 2020* could introduce additional non-point source pollutants to downstream surface waters. However, existing regulations and water quality policies and programs contained in the *Draft GP 2020* would reduce this to a less-than-significant impact.	LTS	No mitigation would be required.	LTS
4.5-2 Water Quality – Soil Erosion and Sedimentation Related to Construction Land uses and development consistent with the *Draft GP 2020* could result in increased soil erosion and sedimentation during construction activities, thereby degrading water quality in downstream waterways. However, existing regulations and water quality policies and programs contained in the *Draft GP 2020* would reduce this to a less-than-significant impact.	LTS	No mitigation would be required.	LTS

Impact	Significance Before Mitigation	Mitigation	Significance After Mitigation
4.5-3 Water Quality – Agricultural and Resource Uses Agricultural and resource development (i.e., timber harvesting and mineral resources extraction) land uses consistent with the *Draft GP 2020* could result in an increase in sediment and nutrients in downstream waterways.	S	4.5-3(a) Revise Policy **WR-li** as follows to expand the scope of the educational and technical assistance programs to include BMPs for reducing erosion and sedimentation and runoff rates from cultivated slopes. Revise Policy **WR-1i** as follows: **Policy WR-1i**: Implement erosion and sediment control requirements for vineyards and row crops. Develop and implement educational and technical assistance programs for agricultural activities including vineyard and crop production, development of BMPs which focus on reduction of peak runoff rates on all cultivated slopes, and erosion and sedimentation on slopes greater than 35 percent. 4.5-3(b) Revise **Water Resources Program 1: Education and Technical Assistance**, as follows: **Program Description**: Develop a public education and technical assistance program that provides property owners, applicants, and the general public with information regarding stormwater pollution, efficient water use, public water supplies, water conservation and re-use, and groundwater. Include the preparation of BMPs for agricultural cultivation that addresses reduction of peak runoff from cultivated slopes and erosion and sedimentation on slopes greater than 35 percent.	SU
4.5-4 Water Quality – Wastewater Disposal Land uses and development consistent with the *Draft GP 2020* could result in sewer- and septic-related water quality problems, including the reuse of treated water. However, policies provided in the *Draft GP 2020* would adequately reduce such impacts to a less-than-significant level.	LTS	No mitigation would be required.	LTS
4.5-5 Groundwater Level Decline Land uses and development consistent with the *Draft GP 2020* would increase demand on groundwater supplies and could therefore result in the decline of groundwater levels.	S	4.5-5 Revise Policy **WR-2f** to include the following: **Policy WR-2f**: Require that discretionary projects, to the maximum extent practicable, maintain or increase the site's pre-development absorption of runoff to recharge groundwater. Implementation would include standards which could regulate impervious surfaces; vary by project type, land use, soils and area characteristics; and provide for water impoundments, protecting and planting vegetation, cisterns, and other measures to increase runoff retention and groundwater recharge. Develop voluntary guidelines for rural development that would accomplish the same purposes.	SU

Impact	***Significance Before Mitigation***	***Mitigation***	***Significance After Mitigation***
4.5-6 Saltwater Intrusion Land uses and development consistent with the *Draft GP 2020* would increase demand on groundwater supplies in areas susceptible to saltwater intrusion. Increased groundwater pumping in certain areas of the lower Petaluma River, Sonoma Creek, and Bodega Bay could result in saltwater intrusion.	LTS	No mitigation would be required.	LTS
4.5-7 Well Competition and Adverse Well Interference Land uses and development consistent with the *Draft GP 2020* could result in an increase in the number of private wells in unincorporated areas of the County. Approval of wells in Class I or Class II areas could result in well interference impacts.	S	4.5-7 Revise Policy **WR-2c** to require that pump tests be conducted for all new high capacity wells where there is reason to believe that there may be potential adverse effects on existing adjacent wells. Revise the end of Policy **WR-2c** to include the following: **Policy WR-2c**: Revise ordinance requirements for permits to drill, replace, deepen or repair all wells as follows: (Policy items 1-6 remain the same.) (7) <u>Require pump tests for new high capacity wells to avoid well interference between proposed</u>.	SU
4.5-8 Changes to Drainage Patterns Leading to Streambank Erosion Land uses and development consistent with the *Draft GP 2020* would result in alterations to existing drainage patterns. Such changes would increase erosion, both in overland flow paths and in drainage swales and creeks.	S	4.5-8 Add a new policy to Section 3.1 of the Water Resource Element addressing the effects of changes in drainage patterns leading to increased erosion in drainage swales and streams. Add a new policy **WR-1w** as follows: **Policy WR-1w**: Revise the County's flood control design criteria to include a section on stream geomorphic analysis and to update information on bank protection and erosion control to incorporate biotechnical bank stabilization methods for the purpose of preventing erosion and siltation in drainage swales and streams.	SU

Impact	Significance Before Mitigation	Mitigation	Significance After Mitigation
4.5-9 Increased Flood Risk from Drainage System Alteration Land uses and development consistent with the *Draft GP 2020* would result in increases in stormwater runoff and peak discharge. Existing storm drain systems, including urban creeks and rivers, may be incapable of accommodating increased flows, potentially resulting in on- or off-site flooding. However, policies and programs contained in the *Draft GP 2020* would reduce such impacts to a less-than-significant level.	LTS	No mitigation would be required.	LTS
4.5-10 Place Housing or Structures in 100-Year Flood Hazard Areas Land uses and development consistent with the *Draft GP 2020* would allow continued development in 100-Year Flood Hazard Areas. However, policies and programs contained in the *Draft GP 2020* would reduce such impacts to a less-than-significant level.	LTS	No mitigation would be required.	LTS
4.5-11 Impede or Redirect Flows in Flood Hazard Areas The placement of land uses and development, particularly structures within 100-year flood hazard areas, could impede or redirect flood flows, resulting in secondary flood damage including bank instability and erosion.	S	Same as Mitigation Measure 4.5-8	SU
4.5-12 Failure of Levee or Dam Potential failure of levees or dams could expose people and structures to inundation and result in loss of property, increased risk, injury or death.	S	4.5-12 Revise Policy **PS-2u** to include a provision for review and rehabilitation of dams and levees that pose a significant threat of inundation to adjacent or downstream development. Revise the end of Policy **PS-2u** to include the following text: **Policy PS-2u**: Encourage the timely completion and filing of inundation maps for all dams whose failure could cause loss of life or personal injury within Sonoma County. Where inundation maps indicate dam or levee failure could cause loss of life or property or personal injury, coordinate with the corresponding responsible party to investigate levee or dam stability and management and identify rehabilitation and maintenance needs as appropriate.	LTS

Impact	*Significance Before Mitigation*	*Mitigation*	*Significance After Mitigation*
Biological Resources			
4.6-1 Special Status Species Land uses and development consistent with the *Draft GP 2020* could result in loss of populations or essential habitat for special-status species.	S	4.6-1 Add a new policy to Section 3.1 of the Open Space and Resource Conservation Element to encourage continued participation in the FishNet4C program: **Policy OSRC-7v**: Continue to actively participate in the FishNet4C program and work cooperatively with participating agencies to implement recommendations to improve and restore aquatic habitat for listed anadromous fish species and other fishery resources.	SU

Impact	Significance Before Mitigation	Mitigation	Significance After Mitigation
4.6-2 Sensitive Natural Communities Land uses and development consistent with the *Draft GP 2020* could result in loss of sensitive natural communities.	S	4.6-2 Policies pertaining to sensitive natural communities in the *Draft GP 2020* could be revised to include new language encouraging protection of the remaining old growth forests in Sonoma County, and to improve protection of riparian corridors. This consists of the following amendments to the Open Space and Resource Conservation Element: 4.6-2(a) Add a new policy to Section 3.1 of the Open Space and Resource Conservation Element as follows: **Policy OSRC-7v**: Identify and consider designation of old growth redwood and Douglas fir forest as sensitive natural communities. Encourage preservation and public acquisition of any remaining old growth redwood and Douglas fir forests in private ownership in the County. Because of their rarity and biological importance, these sensitive natural community types should be made priorities for protection through conservation easements, fee title, or other mechanisms. 4.6-2(b) Revise Policy **OSRC-8c**(10)(a) to ensure restrictions do not result in additional adverse impacts on biological resources as follows: **Policy OSRC-8c**: Rezone to the Biotic Resources combining zoning district all lands within the streamside conservation areas. Adopt an ordinance which provides for their protection in conformance with the following principles. Until the ordinance is adopted, require that land use and development comply with these principles: (Policy items 1-9 do not change) (10) Allow stream crossings for roads and utility lines subject to the following design requirements: (a) Be at 75 to 90 degrees to the channel, <u>except when biological impacts to accommodate this approach would be greater</u>. (Policy items (b) through (e) do not change.) (Policy items 11 through 13 do not change.)	SU
4.6-3 Wetlands Land uses and development consistent with the *Draft GP 2020* could result in direct or indirect impacts on jurisdictional wetlands and unvegetated other waters.	LTS	No mitigation would be required.	LTS

Impact	***Significance Before Mitigation***	***Mitigation***	***Significance After Mitigation***
4.6-4 Wildlife Habitat and Movement Opportunities Land uses and development consistent with the *Draft GP 2020* would result in a reduction of existing wildlife or fish habitat, contribute to habitat fragmentation, and result in obstruction of movement opportunities. Aspects of the applicable policies contained in the *Draft GP 2020* would serve to partially address these impacts, but the conversion, fragmentation, and obstruction would be a significant impact.	S	4.6-4 No mitigation available beyond the *Draft GP 2020* policies	SU
4.6-5 Conflict with Local Policies or Ordinances Proposed policies in the *Draft GP 2020* that affect biological resources may differ from local policies and ordinances currently in effect. However, potential conflicts would be addressed by the revisions of the implementing ordinances to ensure that they conform to the proposed policies.	LTS	No mitigation would be required.	LTS
4.6-6 Conflict With Adopted Habitat or Natural Community Conservation Plans Land uses and development consistent with the *Draft GP 2020* would not conflict with any adopted Habitat or Natural Community Conservation Plans.	LTS	No mitigation would be required.	LTS
Geology / Soils			
4.7-1 Seismic Ground Shaking Land uses and development consistent with the *Draft GP 2020* would expose people or structures to substantial adverse seismic effects, including the risk of loss, injury, or death involving strong seismic groundshaking.	S	4.7-1 Revise Policy **PS-1o** to specifically include all multiple family residential URM structures. **Policy PS-1o**: Adopt an ordinance requiring strengthening and / or reinforcement of Unreinforced Masonry Buildings, <u>including multi-family</u>, but not single family residential structures.	SU

Impact	Significance Before Mitigation	Mitigation	Significance After Mitigation
4.7-2 Seismic Related Ground Failure Implementation of the *Draft GP 2020* would expose people or structures to potential substantial adverse seismic effects, including the risk of loss, injury, or death from seismic-related ground failures such as surface fault rupture, lateral spreading, lurching, differential settlement, and flow failures. While the policies included in the *Draft GP 2020* would reduce most impacts to an acceptable level, seismic related ground failure impacts related to roads, public facilities, and other County projects would remain significant.	S	4.7-2 No mitigation available beyond the *Draft GP 2020* policies.	SU
4.7-3 Landsliding Land uses and development consistent with the *Draft GP 2020* would expose people and structures to substantial damaging effects of landsliding, including the risk of loss, injury, or death from down slope earth movement that may be slow or rapidly occurring. This kind of geologic hazard can be caused by earthquake, seasonal saturation of the soils and rock materials, erosion, or grading activities.	S	4.7-3 No mitigation available beyond the *Draft GP 2020* policies.	SU
4.7-4 Subsidence and Settlement Land uses and development consistent with the *Draft GP 2020* could expose property and structures to the damaging effects of ground subsidence hazards. This kind of geologic hazard can be seismically triggered (e.g., liquefaction), caused by seasonal saturation of the soils and rock materials, or caused by grading activities.	S	4.7-4 No mitigation available beyond the *Draft GP 2020* policies.	SU

Impact	*Significance Before Mitigation*	*Mitigation*	*Significance After Mitigation*
4.7-5 Tsunamis and Seiches Land uses and development consistent with the *Draft GP 2020* could expose people and structures in limited areas of the county to potential, substantial adverse seismically caused flooding and strong tidal effects, including the risk of loss, injury, or death. While the policies included in the *Draft GP 2020* would reduce impacts to an acceptable level, tsunami and seiche impacts related to roads, public facilities, and other County projects would be significant.	S	4.7-5 No mitigation available beyond the *Draft GP 2020* policies.	SU
4.7-6 Soil Erosion Erosion can result in the loss of agricultural soil resources, as well as expose improvements to erosion-related damage such as undermining and settlement, and in severe cases can progress to landsliding.	S	4.7-6 No mitigation available beyond the *Draft GP 2020* policies.	SU
4.7-7 Expansive Soils Land uses and development consistent with the *Draft GP 2020* could expose property improvements to potential adverse effects from expansive soils. Expansive soils can cause damage to improvements, especially structures such as residential buildings, small commercial buildings and pavements.	LTS	No mitigation would be required.	LTS
4.7-8 Septic Suitability of Soils The construction of septic tanks or alternative wastewater disposal systems on soils incapable of adequately supporting such systems can cause damage to improvements and can adversely impact surface and ground water resources. Policies and programs contained in the *Draft GP 2020* would reduce such impacts to a less-than-significant level.	LTS	No mitigation would be required.	LTS
4.7-9 Mineral Resources Land uses and development consistent with the *Draft GP 2020* could result in the loss of the availability of a known mineral resource.	LTS	No mitigation would be required.	LTS

Impact	Significance Before Mitigation	Mitigation	Significance After Mitigation
Agricultural and Timber Resources			
4.8-1 Conversion of Agricultural Lands to Non-Agricultural Uses Implementation of the *Draft GP 2020* would result in conversions of both County and State designated farmlands to non-agricultural uses.	LTS	No mitigation would be required.	LTS
4.8-2 Agricultural Processing and Support Uses Implementation of the *Draft GP 2020* would result in the development of agricultural support uses including processing services and storage on agricultural lands and would therefore remove a portion of the county's agricultural lands from agricultural production. However, due to the limited acreage that would be removed as well as policies and programs contained in the *Draft GP 2020* regulating such development, this would be a less-than-significant impact.	LTS	No mitigation would be required.	LTS
4.8-3 Agricultural Tourism Implementation of the *Draft GP 2020* would result in the development of visitor-serving uses on agricultural lands and would therefore convert a portion of the county's agricultural lands to these uses. However, due to the limited acreage that would be lost as well as policies and programs contained in the *Draft GP 2020* regulating such development, this would be a less-than-significant impact.	LTS	No mitigation would be required.	LTS
4.8-4 Timberland Conversion Implementation of the *Draft GP 2020* could result in the conversion of timberland to non-timber uses. However, the acreage of timberland converted to non-timber uses would be relatively small and would be a less-than-significant impact.	LTS	No mitigation would be required.	LTS

Impact	Significance Before Mitigation	Mitigation	Significance After Mitigation
Public Services			
4.9-1 Insufficient Water Supplies to Meet the Future Water Demand of the Urban Service Areas Land uses and development consistent with the *Draft GP 2020* would increase the demand for water. As a result, insufficient water supplies would be available to serve some of the unincorporated USAs from existing entitlements. New or expanded entitlements would be required.	S	No mitigation available beyond the *Draft GP 2020* policies.	SU
4.9-2 Insufficient Water Supplies to Meet the Future Water Demand of Rural Private Domestic, Small Municipal, and Agricultural Wells Land uses and development consistent with the *Draft GP 2020* would result in an increased demand on groundwater supplies for rural uses. Due to the lack of comprehensive information regarding the county's groundwater resources, it is uncertain if groundwater supplies would be sufficient to meet the future demand of rural private domestic, small municipal, and agricultural wells. This uncertainty combined with the current regulatory approach could result in insufficient groundwater supplies in rural areas of the county.	S	Same as Mitigation Measure 4.5-5.	SU
4.9-3 New or Expanded Water Supply Facilities Land uses and development consistent with the *Draft GP 2020* could result in the need for increased water supply facilities, either through the construction of new facilities or through the expansion or retrofitting of existing facilities. Construction of new or expanded water supply facilities could result in site-specific impacts, especially on aquatic organisms and fisheries.	S	No mitigation available beyond the *Draft GP 2020* policies.	SU

Impact	Significance Before Mitigation	Mitigation	Significance After Mitigation
4.9-4 Increased Wastewater Treatment Demand Land uses and development consistent with the *Draft GP 2020* would generate wastewater flows that exceed treatment capacity of wastewater treatment services and would require both construction of new facilities and improvements to existing facilities.	S	No mitigation available beyond the *Draft GP 2020* policies.	SU
4.9-5 New or Expanded Wastewater Facilities Land uses and development consistent with the *Draft GP 2020* could result in the need for increased wastewater facilities, either through the construction of new facilities or through the expansion or retrofitting of existing facilities. Construction of these facilities could result in site-specific impacts.	S	No mitigation available beyond the *Draft GP 2020* policies.	SU
4.9-6 Increased Solid Waste Disposal Demand Land uses and development consistent with the *Draft GP 2020* would generate solid waste streams that would exceed the disposal capacity of the Sonoma County Central Landfill. After this date, the transport of solid waste to landfills outside of Sonoma County with sufficient permitted capacity would commence. Due to the lack of certainty regarding the county's future landfill capacity, this would be a significant impact.	S	4.9-6 Add a policy to the Public Facilities and Services Element that would provide guidance to the County Integrated Waste Management Plan to provide for future landfill capacity needed to meet the county's future demands for waste disposal. **Policy PF-2bb**: Amend the County Integrated Waste Management Plan as necessary to continue to address potential shortfalls in future landfill capacity.	SU
4.9-7 Increased Demand for Parks and Recreation Services and Facilities Implementation of the *Draft GP 2020* would require new or expanded Community and Neighborhood Parks, Regional Recreation Areas, and Regional Open Space Parks in order to achieve recognized park planning standards. The construction of these facilities could result in adverse physical effects on the environment.	S	4.9-7 Add a new policy to the Public Facilities and Services Element as follows: **Policy PF-2cc** Adopt and implement an Outdoor Recreation Plan with parks and recreation facilities necessary to meet the needs of the *Draft GP 2020.*	SU

Impact	Significance Before Mitigation	Mitigation	Significance After Mitigation
4.9-8 Demand for Public Education Services Implementation of the *Draft GP 2020* would not generate a substantial demand for school services beyond the existing public school capacity and would not result in the need for additional facilities.	LTS	No mitigation would be required.	LTS
4.9-9 Increased Demand for Fire Protection and Emergency Services Facilities Implementation of the *Draft GP 2020* would increase the demand for fire protection and emergency services and require the construction of new or expanded fire protection and emergency services facilities.	S	No mitigation available beyond the *Draft GP 2020* policies.	SU
4.9-10 Wildland Fire Hazards Implementation of the *Draft GP 2020* would expose people or structures to risk of loss, injury, or death involving wildland fires.	S	4.9-10 Revise Policy **PS-3m** as follows: **Policy PS-3m**: Require automatic fire sprinkler systems in all new residential and commercial structures, with exceptions for detached utility buildings, garages, and agricultural-exempt buildings. Require automatic fire sprinkler systems at the time of expansion of existing residential and commercial buildings except as provided for in the Sonoma County Code.	SU
4.9-11 Demand for Additional Criminal Justice Facilities Implementation of the *Draft GP 2020* would increase the demand for new or expanded Sheriff's Department substations and detention facilities, the construction of which could cause significant environmental impacts.	S	No mitigation available beyond the *Draft GP 2020* policies.	SU
4.9-12 Increased Demand for Library Facilities Implementation of the *Draft GP 2020* would result in the demand for new or expanded County Library facilities in order to maintain acceptable service levels.	S	No mitigation available beyond the *Draft GP 2020* policies.	SU

Impact	Significance Before Mitigation	Mitigation	Significance After Mitigation
4.9-13 Increased Demand for Human Services Facilities Implementation of the *Draft GP 2020* could exceed the ability of the County's Human Services Department to maintain an acceptable level of service within its present level of funding and facilities and therefore could result in the expansion or construction of new Human Services facilities.	S	No mitigation available beyond the *Draft GP 2020* policies.	SU
Cultural Resources			
4.10-1 Historic Resources Land uses and development consistent with the *Draft GP 2020* could result in the disturbance of historic resources.	S	4.10-1 Add a new policy in the Open Space and Resources Conservation Element as follows: **Policy OSRC-19j** Develop a Historic Resources Protection Program that provides for an ongoing process of updating the inventory of historic resources. Such a program should include: (1) Periodic historic building surveys; (2) Formalized recognition of the inventory of historic resources as recommended by the State Office of Historic Preservation, including, rezoning to the Historic Combining District (HD); and (3) Procedures for the protection of recognized historic resources for both ministerial and discretionary permits.	LTS
4.10-2 Archeological and Paleontological Resources and Human Remains Land uses and development consistent with the *Draft GP 2020* could result in the disturbance of subsurface archeological and paleontological resources as well as human remains, including those interred outside of formal cemeteries.	S	4.10-2 Add new policy to the Open Space and Resource Conservation Element in order to develop and adopt a countywide procedure for protection of archeological and paleontological resources. This program would provide guidelines for land uses on parcels identified by the Northwest Information Center (NWIC) as likely to contain human remains or archeological and paleontological resources. **Policy OSRC-19k**: Develop an archeological and paleontological resource protection program that provides: (1) Guidelines for land uses and development on parcels identified as containing such resources; (2) Standard project review procedures for protection of such resources when discovered during excavation and site disturbance; and (3) Educational materials for the general public on the identification and protection of such resources.	SU

Impact	Significance Before Mitigation	Mitigation	Significance After Mitigation
Visual Resources			
4.11-1 Community Separators, Scenic Landscape Units, Scenic Corridors, and Scenic Highways Land uses and development consistent with the *Draft GP 2020* could impact the visual quality of Community Separators, Scenic Landscape Units, Scenic Corridors, and Scenic Highways. However, policies contained in the *Draft GP 2020* and the Sonoma County Code would continue to strictly limit the intensity, density, and location of development within these areas and reduce the visual impact on such lands to a less-than-significant level.	LTS	No mitigation would be required.	LTS
4.11-2 Visual Impacts in Other Urban and Rural Areas Land uses and development consistent with the *Draft GP 2020* could impact the visual quality of urban and rural areas that are not designated as scenic resource areas. However, policies contained in the *Draft GP 2020* and existing regulations would reduce these impacts to a less-than-significant level.	LTS	No mitigation would be required.	LTS
4.11-3 Light Pollution and Nighttime Sky Land uses and development consistent with the *Draft GP 2020* would create additional sources of lighting which could result in sky glow, light trespass, and glare.	S	4.11-3 No mitigation available beyond the *Draft GP 2020* policies.	SU

Impact	Significance Before Mitigation	Mitigation	Significance After Mitigation
Energy			
4.12-1 Energy Consumption from Land Use Locations and Patterns The *Draft GP 2020* land use plan could affect energy usage by creating a land use pattern that could increase the dependence on single occupancy vehicles. The proposed land use pattern would be compact and focus future development within or adjacent to existing developed areas. Agricultural production and related uses would continue to be located in agricultural areas. This land use pattern would reduce the future reliance upon single occupancy vehicles, a major user of energy.	LTS	No mitigation would be required.	LTS
4.12-2 Energy Consumption from Building Construction and Retrofit Land uses and development consistent with the *Draft GP 2020* could result in inefficient and excessive use of energy resources. However, the *Draft GP 2020* includes goals, objectives, and policies that would support energy efficiency in new construction and retrofit.	LTS	No mitigation would be required.	LTS
4.12-3 Increased Energy Demand and Need for Additional Energy Resources Future land uses and transportation systems could substantially increase the demand for energy resources and the need for additional energy resources to meet this demand.	S	4.12-3 No mitigation available beyond *Draft GP 2020* policies.	SU

Impact	Significance Before Mitigation	Mitigation	Significance After Mitigation
Hazardous Materials			
4.13-1 Release of Hazardous Materials Land uses and development consistent with the *Draft GP 2020* could result in the transport, use, and / or disposal of hazardous materials, which could result in exposure of such materials to the public either through routine use or due to accidental release. The *Draft GP 2020* includes policies that would address the hazards associated with new land uses and development.	LTS	No mitigation would be required.	LTS
4.13-2 Hazardous Materials, Substances, or Waste near School Sites Land uses and development consistent with the *Draft GP 2020* could result in the increased exposure to hazardous materials in the vicinity of schools.	S	4.13-2(a) Add a new policy to the Public Safety Element as follows: **Policy PS-4p:** Avoid siting of hazardous waste repositories, incinerators, facilities that use a substantial quantity of hazardous materials, or other similar facilities intended primarily for hazardous waste disposal within one-quarter mile of an existing or proposed school facility. 4.13-2(b) Add a new policy to the Public Safety Element as follows: **Policy PS-4q:** Work with School Districts to avoid siting of schools within one-quarter mile of hazardous waste repositories, incinerators, facilities that use a substantial quantity of hazardous materials, or other similar facilities intended primarily for hazardous waste disposal.	LTS
4.13-3 Hazardous Materials near Airports Land uses and development consistent with the *Draft GP 2020* in the vicinity of public use airports or private airstrips could expose people to accidents involving hazardous materials. Current policies and plans, carried forward in the *Draft GP 2020* would address these hazards.	LTS	No mitigation would be required.	LTS

2.4 EVALUATION OF ALTERNATIVES

This EIR examines three alternatives to the *Draft GP 2020* as presently proposed:

- Alternative 1 – the No Project Alternative
- Alternative 2 – the Buildout Alternative
- Alternative 3 – The Mitigated Alternative

Since the primary objective of the *GP 2020* is a policy review, the alternatives that are considered focus on policy alternatives. The No Project Alternative assumes that the existing *General Plan* policies remain unchanged. The other two alternatives, the Buildout Alternative and the Mitigated Alternative, have been formulated to provide environmental impact analyses of a range of policy choices.

A complete description of the three alternatives is contained in ***Chapter 5.0 Alternatives***.

On the basis of the discussion of the proposed project and the three alternatives, this Draft EIR finds that the No Project Alternative and the Buildout Alternatives would result in more severe impacts than the *Draft GP 2020*. The No Project Alternative does not have the benefit of the goals, policies, and programs contained in the *Draft GP 2020*. The increased level of development under the Buildout Alternative would result in more significant impacts compared to the *Draft GP 2020*. The Mitigated Alternative would include additional policies and programs that would result in less significant impacts than the *Draft GP 2020*. Therefore, the Mitigated Alternative would be the environmentally superior alternative. The Mitigated Alternative would have substantially more highway improvements than would the *Draft GP 2020*, resulting in less congestion than the other alternatives. However, these improvements may result in additional secondary impacts. The Mitigated Alternative would also result in less agricultural cultivation and associated facilities such as agricultural processing and support and agricultural tourism uses than would the *Draft GP 2020*. The reduced agricultural cultivation would result in fewer significant impacts compared to the *Draft GP 2020*. However, reduced agricultural production may, over time, result in a gradual decline in agricultural and related support uses that could adversely affect the viability of the county's agriculture based economy.

3.0 PROJECT DESCRIPTION

3.0 PROJECT DESCRIPTION

This chapter describes the proposed project, the Sonoma County General Plan (*Draft GP 2020*) that is analyzed in this EIR. It also describes the location, history, and objectives of the proposed project, as well as the relationship of the proposed project to other plans and regulations that are related to it.

3.1 PROJECT LOCATION

Located along the Pacific coastline, Sonoma County is the most northerly and the largest of the nine counties of the San Francisco Bay Area Region. The county is located about 40 miles north of San Francisco, along the western edge of San Francisco Bay (see **Exhibit 3.0-1**). Sonoma County encompasses almost 1,500 square miles, including the area within the county's incorporated cities. Sonoma County is bordered by the Pacific Ocean on the west, Marin County and San Pablo Bay to the south, Lake, Napa, and Solano counties to the east, and Mendocino County to the north. There are nine incorporated cities within the county: Cloverdale, Cotati, Healdsburg, Petaluma, Rohnert Park, Santa Rosa, Sebastopol, Sonoma, and Windsor. Highway 101 is the primary north-south route through the center of county, with Highway 1 following the coastline and Highway 116 traversing the county in a roughly east-west direction (see **Exhibit 3.0-2**).

PLANNING AREAS

All properties outside of the jurisdictional boundaries of the county's nine incorporated cities are in unincorporated Sonoma County, and constitute the geography to which the *GP 2020* would apply.

The *Draft GP 2020* continues the County's use of *planning areas* to delineate and plan for different regions of the county. **Exhibit 3.0-2** depicts the County's nine planning areas.

Following are the planning area descriptions: [1]

Sonoma Coast / Gualala Basin Planning Area (Planning Area 1)

The majority of this coastal and northwestern lightly populated planning area is designated Resources and Rural Development (in the north) and Land Extensive Agriculture (in the south). The area is not easily accessible to the Highway 101 transportation corridor and urban center of the county. Large areas of the coast are part of the State Park system. The coastal zone portion of the planning area is governed by the Sonoma County *Local Coastal Program.* [2]

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1 Planning area descriptions are updated by Nichols • Berman from the *Draft EIR, Sonoma County General Plan*, Sonoma County Planning Department, 1986.

2 *Local Coastal Program,* Sonoma County PRMD, certified by California Coastal Commission on December 21, 2001.

Exhibit 3.0-1
San Francisco Bay Area

Source: TOPO! Wildflower Productions and Sonoma County PRMD, 2005

Exhibit 3.0-2
Sonoma County and the Nine Planning Areas

The 2000 Census population of this planning area is 8,417. Sea Ranch, Bodega Bay, and Occidental are the only unincorporated communities here with public water and sewer. Sea Ranch is a 5,000 acre planned community along the northern ten miles of the coast. It includes a public golf course, but limited commercial development. Bodega Bay located to the south is the largest coastal community and includes a commercial fishing harbor; an established residential and tourist community, and the Bodega Harbor subdivision. Another new residential development has been approved for the community. Occidental, located inland, supports a residential population and some commercial activities including well-known restaurants.

Annapolis is located inland in the center of the timber production area, historically with only local-serving commercial uses. Jenner, located at the mouth of the Russian River, is a small hillside residential community with some tourist-oriented commercial uses along Highway 1. Other tourist and commercial nodes occur along Highway 1, Highway 116, and the Bodega Highway at the small communities of Stewarts Point, Timber Cove, Fort Ross, Valley Ford, Duncan Mills, Cazadero, Freestone, and Bodega.

The local economy has been historically based on inn and second-home rental stays and park tourism, commercial fishing, grazing sheep and cattle, and timber production. Inland off the coast, a large portion of the land north of the Russian River is in timber preserve. In this area, some forest lands have been converted to vineyards, developed with five wineries. There are 7,000 acres of vineyard. [3] Other upscale resort and residential land uses have occurred nearby.

Cloverdale / N.E. County Planning Area (Planning Area 2)

The City of Cloverdale, with an Urban Service Area (USA) population of 7,052, is the northern-most city in the county along the Highway 101 corridor. The remaining unincorporated population in the Cloverdale planning area is 5,699. The unincorporated community of Geyserville includes residences, inns, restaurants, and commercial uses. Jimtown, nearby in the Alexander Valley, is home to an historic general store and other businesses. Several small pockets of Rural Residential land use occur, mainly outlying Cloverdale.

Vineyards and wineries, located on land designated Land Intensive Agriculture, are the dominant land uses in the Alexander Valley, with about 15,000 acres planted and 30 wineries. There also are 2,000 acres of vineyard and two wineries in the Knights Valley. Cattle grazing and forage crop production are Land Extensive Agriculture land uses outside of the city and vineyard areas.

Warm Springs Dam, located west of Highway 101 at the mouth of Dry Creek, is operated by the U.S. Army Corps of Engineers as a recreation area. The almost 18,000 acres also provide a protected area for wildlife. Approximately 40,000 acres in the northeastern county are designated the Known Geothermal Resource Area. It contains the world's largest geothermal power development.

Healdsburg and Environs Planning Area (Planning Area 3)

Two cities are located within this planning area, Healdsburg and Windsor. The Healdsburg USA has a population of 11,253, while the Windsor USA is twice as large at 22,744. Healdsburg, an older population center developed around a town square, is a visitor focal point for Sonoma County's

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3 *Sonoma County – The Official Visitor's Guide*, County of Sonoma, 2001.

northern wineries. Expensive homes have been built in the surrounding hillsides. Windsor developed initially as a series of subdivisions north of Santa Rosa and was the most recent city to incorporate. In recent years, the Town of Windsor has fostered development of a downtown core west of the freeway in the area near the Town Hall. Both cities have pockets of Rural Residential development on adjacent lands.

Major viticulture development has occurred along the middle reach of the Russian River and within Dry Creek Valley. There are about 15,000 acres of vineyard and 90 wineries. Russian River gravel mining is being phased out in this area. The western part of the planning area, part of the Mendocino Highlands, provides wildlife habitat, areas for timber production, and grazing. Franz Valley and the Chalk Hill Road area, in the eastern part of this planning area, are also developed with vineyards and rural residential. There are about 1,000 acres of vineyard and five wineries.

Russian River Area Planning Area (Planning Area 4)

There are no incorporated cities within the Russian River planning area. The existing population is 16,462, mainly located along the Russian River in the communities of Forestville, Guerneville, and Monte Rio. Historically developed as resort and second home areas, taking advantage of the river amenities, these communities are home to mostly permanent residents. These communities provide water and sewer services and support needed commercial land uses. Land use designations are Urban Residential, Rural Residential, Commercial (various), and Land Intensive Agriculture along the river corridor.

The Russian River area still attracts many visitors with its redwood trees, beaches, camps, inns, short-term rental homes, and other visitor-serving facilities. About 10,000 acres of vineyard and numerous wineries provide a major visitor attraction. Outlying areas primarily are designated Resources and Rural Development, providing wildlife habitat, watershed, and scenic resources. Some lands are designated Diverse Agriculture south of Forestville and support various farm crops.

Santa Rosa and Environs Planning Area (Planning Area 5)

The Santa Rosa planning area is the county's major population center and provider of residential, commercial, office, and industrial land uses. The Santa Rosa USA contains 165,849 people, with 24,899 located in the unincorporated area. The South Santa Rosa and Airport/Larkfield/Wikiup USAs provide water and sewer services. The Charles Schultz Airport, operated by the County, is the largest in the county.

Surrounding Santa Rosa and the urban service areas are a mixture of lands designated Rural Residential, Agriculture (various), as well as Resources and Rural Development. Dairying and the production of forage crops are the predominant agricultural uses in the Laguna de Santa Rosa and south of the city. Vineyards are found along River Road and Bennett Valley. Northeast of Santa Rosa, large parcels provide watershed and wildlife habitat land. There are approximately 9,000 acres of State and County parklands.

Sebastopol and Environs Planning Area (Planning Area 6)

The City of Sebastopol is home to less than half of the residents in this planning area, with 8,108 people within the Sebastopol USA. There are 21,090 residents outside of the Sebastopol USA. There is also a USA providing water and sewer service to the unincorporated community of Graton, north of Sebastopol. Bloomfield and Valley Ford are other unincorporated communities.

Commercial uses are focused within the city and along Highway 116. Rural Residential parcels ranging from two to ten acres house residents, along with interspersed Diverse Agriculture parcels ranging from ten to 40 acres.

An industrial area west of Sebastopol serves the area's existing agricultural activities, primarily apple processing and winery bottling. Vineyards have largely replaced the apple orchards in Green Valley, with about 1,200 acres of vineyard and ten wineries. There are also a large number of small family farms in this area, including apples, specialty vegetables and fruit, flowers, pumpkins, and Christmas trees. These farms are located both on Rural Residential and Diverse Agriculture parcels. The southern third of the planning area is designated Land Extensive Agriculture, used for dairy and grazing.

Rohnert Park – Cotati and Environs Planning Area (Planning Area 7)

The majority of the population in this planning area resides in the Rohnert Park and Cotati USAs, with 42,236 and 7,279 respectively. Rohnert Park is a major commercial and industrial center, while Sonoma State University occupies about 200 acres east of Cotati.

Within the unincorporated area reside 4,059 people. The Penngrove USA, south of the cities, provides water and sewer service to parcels ranging from one to two acres and designated Urban Residential. Penngrove has some commercial uses on Main Street. The unincorporated area, more than half of the planning area, is further comprised of Rural Residential, Diverse Agriculture, and Land Extensive Agriculture parcels. Livestock grazing and forage crop production are predominate agricultural activities.

Petaluma and Environs Planning Area (Planning Area 8)

The City of Petaluma USA is home to more than 80 percent of the planning area's residents, with 55,743 people. The unincorporated area houses 11,046 residents. There are no unincorporated communities; the county population here is concentrated in the Rural Residential area largely west of Petaluma.

Most of the land uses in the unincorporated area are devoted to agriculture, with the dairy industry dominating the planning area west of Highway 101, except for the Rural Residential area mentioned above. East of Highway 101, livestock grazing and forage crop production extend into the Sonoma Mountains. The Petaluma Marsh abuts San Pablo Bay and provides important wildlife habitat. The Port Sonoma marina is also located along the Petaluma River, close to the city. The Infineon Raceway occupies about 370 acres at the junction of Highways 37 and 128. The Coast Guard Training Center is located along the western Marin County border.

Sonoma Valley Planning Area (Planning Area 9)

The Sonoma Valley planning area contains the City of Sonoma, where the USA contains about 25 percent of the area residents, or 9,754. The unincorporated area population is 30,125, the highest unincorporated area population of all planning areas.

There are a number of unincorporated communities, including Kenwood, Glen Ellen, Agua Caliente, Fetters Hot Springs, El Verano, and Boyes Hot Springs. The Sonoma Valley USA provides water and sewer service to these communities, except Kenwood. These communities contain predominantly Urban Residential parcels. Kenwood is served by its own water company; it has an historic tract of smaller parcels. Jack London State Park is in the hills to the west of Glen Ellen.

The other four communities have developed from resort areas with historic sulphur springs. Located on Highway 12 north of the City of Sonoma, Agua Caliente, Fetters Hot Springs, El Verano, and Boyes Hot Springs provide medium and low density residential housing and a mix of commercial uses. There are also several rural residential subdivisions surrounding Sonoma. There are small pockets of Industrial parcels along 8th Street East.

Much of the planning area is devoted to agriculture. The Sonoma Valley has about 13,000 acres of vineyard and 42 wineries. The Sonoma Mountain viticulture area has about 800 acres of vineyard and three wineries. The Carneros-Sonoma viticulture area is the location of about 8,000 acres of vineyard and 22 wineries.

The hillsides east and west of the Sonoma Valley are designated Resources and Rural Development, Rural Residential, and Diverse Agriculture. The lands south of Sonoma are predominantly Land Extensive Agriculture, used for dairy and forage production. There is a large area of marshland along the San Pablo Bay, where Skaggs Island is an adjacent federal military facility.

3.2 PROJECT OBJECTIVES AND HISTORY

Project History

The existing *General Plan* was adopted in 1989 after three and a half years of work and over two years of public hearings.[4] The plan established nine major planning goals as the basic framework of its goals, objectives, and policies. These nine major goals are contained in the Land Use Element of both the existing *General Plan* and the *Draft GP 2020*. They relate to the following subjects:

- Growth projections and growth policy;
- City and community centered growth;
- Compact city and community boundaries;
- Phasing of rural and urban growth with availability of adequate services;
- Open space separation between cities/communities;
- Opportunities for diverse rural and urban residential environments;
- Use of environmental suitability criteria to locate urban and rural growth;
- Protection of agricultural lands; and
- Preservation of scenic features and biotic resource areas.

4 *Sonoma County General Plan*, adopted by the Sonoma County Board of Supervisors on March 23, 1989, as amended.

In the 15 years since the existing *General Plan* was adopted Sonoma County has experienced a number of significant events that have affected and will continue to affect land use and development. These include: [5]

- The continued success and expansion of wine grapes as the dominant agricultural commodity;
- A booming economy in the late 1980s and late 1990s and population, housing, and job growth that exceeded projections during that period;
- The incorporation of the Town of Windsor;
- A sequence of major floods in the Russian and Petaluma River Basins;
- Listing of salmonids as endangered or threatened species;
- Litigation over the Housing Element;
- The successful creation of the Agricultural Preservation and Open Space District and accompanying funding measure;
- The temporary municipal water supply impairment and longer term questions regarding the availability of water from the Eel River and Russian River Basin;
- Regional and local wastewater system capacity problems; and
- Major reorganization of County Government, particularly the consolidation of permitting services at Permit and Resource Management Department (PRMD).

In reviewing the status of the existing *General Plan* and establishing the scope of the General Plan update, the County decided not to conduct a major overhaul of the above policy framework. Instead, the work program for the *GP 2020* is limited to a "Policy Review" of selected issues approved by the Board of Supervisors after substantial input from County staff, the general public, and the appointed Citizen's Advisory Committee. The scope of the update also limits the extent to which land use map changes would be considered, due to similarly strong support for maintaining the current land use designations and policies that concentrate future growth in the cities and county urban service areas. Only minor changes to land use maps are included, primarily to correct long-standing legal non-conforming uses and to implement changes necessitated by policy changes emanating from the selected issues.

CITIZEN PARTICIPATION

The public participation program for the *GP 2020* included direct e-mail contact with the *GP 2020* County staff project team, community meetings, a Citizen's Advisory Committee (CAC) that held public meetings, as well as five subcommittees of the CAC (Water Resources, Circulation and Transit, Agricultural Tourism, Agricultural Processing, and Riparian Corridors / Biological Habitat). An

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5 *Status Report on the 1989 General Plan*, Sonoma County PRMD, [online] available at http://www.sonoma-county.org/prmd/gp2020/status.html, August 10, 2004.

informational website was also maintained. The CAC process began with public community meetings and has continued throughout the process of formulating the *Draft GP 2020* analyzed in this EIR.

The CAC is composed of 15 citizen volunteers, three from each Supervisorial District, and two alternate members appointed by the Board of Supervisors. The CAC has served to represent the interests of the community at large, has held numerous meetings throughout the *GP 2020* process and has recommended the policy changes in the *Draft GP 2020*.

Project Objectives

The overall objective of the *GP 2020* is to review and consider policy changes only on selected topics or issues. These policies and issues were established by the Board of Supervisors following extensive public input and recommendations of the Citizen's Advisory Committee, appointed by the Board. The community at large, and the Citizen's Advisory Committee, felt strongly that the existing General Plan was functioning well as the County's land use guide. As a result, the *Draft GP2020* continues to follow the existing General Plan land use maps and its major goals, so that the policies that are reviewed and revised are in keeping with these goals.

Therefore, the proposed project consists of the following issues as defined in the work program established through the community outreach process:

- Housing Element Implementation: Mixed Use, Single Room Occupancy Units, and Affordable Housing Sites/Overlay District;
- Agricultural Resource Issues: Agricultural Tourism, Agricultural Processing and other Support Uses, Organic Agriculture, Aquaculture, Local Food Supply, Equestrian Uses, and Rural Residential Lands as Agricultural;
- Timber Resource Issues: Timber Conversions and Timber Harvest Regulations;
- Biotic Resource Issues: Riparian Corridors and Biotic Habitat Areas;
- Public Safety Issues: Hazardous Materials, Geologic Hazards, Flood Hazards, and Fire Hazards;
- Water Resource Issues: Groundwater and Surface Water;
- Air Transportation Issues: conformance with the Airport Land Use Commission's Comprehensive Land Use Plan;
- Scenic Resource Issues: Lighting and Glare, Highway 116 Scenic Corridor, Rural Character, Urban Design, Mayacamas Development Guidelines, Community Separators, and Scenic Landscape Units;
- Sustainability Principles;
- Circulation and Transit Issues;

- Land Use Issues: Permanent Occupancy of RV Campgrounds, Land Use Requests, Recreation and Visitor Serving Uses in rural areas, Churches and Schools, Urban Service Boundaries, Certificates of Compliance, Public Uses, and re-use of public properties;

- Noise Issues;

- Energy Resource Issues;

- Population, Household, and Job Projections;

- Public Services and Facility Issues: Youth and Family Services, Public Water and Sewer System Capacities, Package Treatment Plants, and Solid Waste Plans; and

- Implementation: Indicators and Monitoring, and Specific and Area Plan Conformity.

It was not the intent of the work program to update all of the issues addressed in the existing *General Plan*. Examples of issues not addressed in this General Plan update include Bikeways, Recreational Facilities, Land Use categories and Development Criteria, Scenic Corridors, Mineral and Geothermal Resources, Archaeological/Historic Resources, and Education and Fire Protection Services.

As a result of the limitations on policy issues to be considered in the update, the proposed project assumes that policies related to all other issues would remain unchanged from those of the existing *General Plan*. This limitation is particularly important with respect to the land use map designations and changes in future land use and development potential in the unincorporated area. These limitations have a direct bearing on the range of alternatives that are available for consideration in this EIR, as the development potential being compared in the alternatives is essentially the same.

It is also important to note that for each of the policy issues being considered, there are a number of policy options that could be adopted. The proposed project identified as the *Public Hearing Draft GP 2020* is based upon the policy options recommended by the Citizen's Advisory Committee, but this EIR is also intended to inform decision makers about the environmental consequences of the range of options presented for each issue. The EIR uses the alternatives section to provide these impact comparisons.

The proposed project also includes amendments of other Specific and Area Plans needed to maintain consistency with the *GP 2020*. These include the Windsor Specific Plan and eight Area Plans (West Petaluma, Petaluma Dairy Belt, South Santa Rosa, Sonoma Mountain, Bennett Valley, Penngrove, Larkfield-Wikiup, and Franz Valley).

Relationship to Area and Regional Plans

Since the existing *General Plan* was adopted in 1989, a number of programs providing more formal countywide coordination over land use issues have taken place. In addition to the Local Agency Formation Commission (LAFCo), the Sonoma County Transportation Authority is another subregional body that is responsible for prioritizing transportation improvements. A Subregional Issues Report sponsored by the Association of Bay Area Governments (ABAG) was jointly prepared and adopted by the County and cities in 1995. Recently, a City of Santa Rosa initiative to conduct a countywide workforce housing study was joined by other cities and the County.

Both the existing *General Plan* and the *Draft GP 2020* have been coordinated with the general plans of the nine incorporated cities within Sonoma County. Areas for future expansion of the cities have been coordinated with the cities. Although the *Draft GP 2020* does not regulate development within the cities, it is applicable to lands within the unincorporated parts of the various city spheres of influence.

Sonoma County's adoption of the *GP 2020* may lead to revisions to the County's Development Code, including the Zoning Ordinance. It is possible that changes could be made to other existing County plans and programs as well, depending on the final adopted provisions of the *GP 2020*. A number of future actions may be based (in whole or part) on the environmental evaluation undertaken as part of the *Draft GP 2020* and this EIR. Review and approval of subsequent development projects may require review and approval by agencies including, but not limited to: Sonoma County, which has jurisdiction over General Plan amendments, zone changes, subdivisions, conditional use permits, and other discretionary development approvals; the U.S. Army Corps of Engineers, which issues federal 404 permits for individual development projects and public works projects; the Regional Water Quality Control Boards, which issues state National Pollutant Discharge Elimination System (NPDES) permits for individual private development projects and public projects; and the California Department of Fish and Game (CDFG), which issues state Section 1600 *et seq.* permits for individual private development projects and public works projects.

Over the course of the last 15 years, a number of other federal, State, regional, and local plans and other laws have been adopted that will affect the land use and development consistent with the *Draft GP 2020*. In some cases, compliance with these plans / laws will provide additional reduction of the impacts of future land uses and development. In other cases, these plans / laws may pre-empt County jurisdiction, resulting in environmental impacts that may not occur in their absence.

FEDERAL GOVERNMENT

There are no federal plans that directly affect local land use decisions, but federal laws such as the Endangered Species Act (ESA) can affect individual land uses in a significant way. Whenever federal funding is involved regarding road and highway projects or other public infrastructure, the projects must comply with the National Environmental Policy Act (NEPA) as well as the ESA. The US Army Corps of Engineers, the US Fish and Wildlife Service, the National Oceanic and Atmospheric Agency, and the Department of Housing and Urban Development are examples of responsible agencies that exercise jurisdiction over many such projects.

STATE AND REGIONAL GOVERNMENT

State and regional agencies also exert strong influence on local land use and development decisions. In some cases, these agencies have adopted plans. The State's influence is primarily accomplished through funding of public infrastructure. In some matters, however, direct control is wielded. An example is the requirement for certification of Housing Elements by the Department of Housing and Community Development. State law also dictates much of the content of General Plans and related zoning regulations.

The Coastal Commission also has jurisdiction over Local Coastal Plans and regulations within the Coastal Zone. The California Department of Fish and Game, Department of Conservation, and Department of Forestry and Fire Protection influence or directly regulate various future land uses and development in the county.

In addition, State requirements are often implemented through regional planning and regulatory agencies. Examples are:

- The Regional Water Quality Control Boards' Basin Plans and point and non-point water quality regulations;
- The Metropolitan Transportation Commission's Regional Transportation Plans;
- The Association of Bay Area Government's distribution of Regional Housing Needs; and
- The Air Quality Management Districts' Clean Air Plans and permit regulations.

Three other quasi-regional agencies which influence local land use decisions and development project decisions are the Airport Land Use Commission (ALUC), the Local Agency Formation Commission (LAFCo), and the Sonoma County Transportation Authority (SCTA). These are state-mandated bodies which exercise independent authority over particular types of projects or projects in particular locations. In these cases, though, the County is a non-majority participant in the decision making of the agency.

The ALUC is required to adopt a Comprehensive Airport Land Use Plan that affects projects in the vicinity of the six public use airports in the county. LAFCo is responsible for decisions regarding the formation and organization of special districts which provide public services to county residents and regarding the geographical area served by special districts and cities through spheres of influence and annexation. Finally, the SCTA is a regional transportation planning agency that is influential in obtaining funding and prioritizing circulation projects.

CITY PLANS

Each City in Sonoma County exercises complete authority over land use and development within its city limits. Cities will occasionally exercise authority over sewer, water, and other services outside of the city limits. An example is the South Park Sanitation District south of the City of Santa Rosa. Development in this area cannot be constructed on public water and sewer unless the City agrees to approve a "Utility Certificate" providing these services.

LOCAL COASTAL PLAN

Sonoma County's planning regulations presently include both a General Plan (the existing *General Plan*) and a Local Coastal Plan (*LCP*).[6] The *Draft GP 2020* includes a proposed change that would result in the *LCP* being a standalone plan; albeit one that contains many of the same goals, objectives, and policies.[7] This approach is designed to make it easier for the public and property owners to understand the policies that would affect their properties and to make the *LCP* easier for the County and Commission staff to administer. At the same time, many of the countywide goals, objectives, and

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6 *County of Sonoma Local Coastal Program, Part I Local Coastal Plan.* The LCP was amended to be consistent with the existing *General Plan* and certified by the California Coastal Commission on December 12, 2001.

7 The preparation and adoption of a Local Coastal Plan is exempt from *CEQA*. Public Resources Code Section 21080.9.

policies of the *GP 2020* would be included in the *Draft LCP* that will be considered after the adoption of the *GP 2020*. This will allow, where appropriate and consistent with the Coastal Act, countywide policy consistency in areas such as Water Resources, Noise, Public Facilities and Services, Housing, Public Safety, etc.

3.3 DESCRIPTION OF THE DRAFT GP 2020

Overview of the Draft GP 2020

The *Draft GP 2020* is organized into the following ten elements: land use, housing, agricultural resources, open space and resource conservation, water resources, public safety, circulation and transit, air transportation, public services and facilities, and noise. The following is a brief description of each of the *Draft GP 2020* elements:

Land Use Element*:* The Land Use Element would provide for the distribution, location and extent of uses of land for housing, business, industry, open space, agriculture, natural resources, recreation and enjoyment of scenic beauty, education, public buildings and grounds, solid and liquid waste disposal facilities, and other uses. Where appropriate, it would include standards for population density and building intensity for individual land use categories.

The Land Use Element and its policies would guide growth and the development and use of land in the unincorporated areas of Sonoma County through 2020. The element would include a countywide land use policy framework, specific land use policies and a land use map for each of the nine planning areas and an implementation program.

The nine major goals of the *Draft GP 2020* are identified below, along with two major goals that are proposed addressing water resources and principles of sustainability. The goals are summarized as follows:

- Accommodate Sonoma County's fair share of future regional growth, consistent with environmental constraints, maintenance of quality of life, and the capacities of public facilities and services. Achieve a better balance between job opportunities and population growth;

- Accommodate most future growth within the incorporated cities and their Urban Growth Boundaries, and within unincorporated communities that have adequate water and sewer capacities in their Urban Service Areas;

- Locate future growth within the cities and urban service areas in a compact manner, using vacant infill parcels and lands adjacent to existing development;

- Maintain adequate public services to accommodate projected growth that will be able to provide any needed services;

- Identify and maintain open space between the county's cities and communities;

- Provide diverse housing types and densities, with urban densities in the cities and in some unincorporated communities, with lower density in rural communities;

- Protect people and property from environmental risks and hazards and limit development on sensitive environmental lands;

- Ensure that the County's water resources are protected on a sustainable yield basis which avoids long-term declines in available surface and groundwater resources or water quality;

- Protect lands in agricultural production, as well as lands potentially suitable for agricultural use. Retain large parcel sizes and avoid incompatible non-agricultural uses;

- Limit the uses and intensity of land development to be consistent with the preservation of important biotic resource areas and scenic features; and

- Promote a long-term sustainable future that balances environmental preservation with jobs, housing, infrastructure, and services.

The Land Use Element includes a set of proposed land use maps (one for each of nine planning areas) that depict existing and proposed land use designations in the unincorporated county area. For the most part, these designations are identical to those in the existing *General Plan*. The Land Use Maps also depict the location of all of the proposed Urban Service Areas as well as those particular Urban Service Areas where new affordable housing sites are proposed for rezoning. A more detailed description of the proposed changes that are being considered as part of the *Draft GP 2020* are shown in ***Section 4.1 Land Use, Population and Housing***.

POPULATION AND HOUSING PROJECTIONS

This EIR evaluates policies and programs in the *Draft GP 2020* that would lead to alterations in the physical environment. The evaluation includes changes in population, housing, and land use patterns that would occur in Sonoma County as the *GP 2020* is implemented. The project encompasses all of the future land uses and development that are projected to occur, including residential, commercial, industrial, agricultural, and other land uses and development, as well as the entire foreseeable public infrastructure that is necessary to serve the projected uses. The *Draft GP 2020* is based upon a projected amount of growth, and does not assume that all properties would be fully developed. The *Build Out* alternative, on the other hand, would assume construction of the maximum amount of development allowed under the Land Use Element.

Historical Growth and Existing Conditions

Sonoma County is the sixth most populous of the nine San Francisco Bay Area counties and largest in the North Bay region. In 2000, Sonoma County had a total population of 458,614 with approximately 28 percent, or 128,596 persons, residing in the county's unincorporated area outside of the City Urban Service Areas. [8] These population totals are generally consistent with those contained in the existing *General Plan* that projected a 2005 countywide population of 468,540 of which 151,040 would reside in unincorporated areas.

Population growth in Sonoma County since 1980 has been driven primarily by economic booms in both the late 1980's and late 1990's. Table LU-2 in the Land Use Element of the *Draft GP 2020*

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8 *Quick Facts for Sonoma County*, US Census Bureau, [online] available http://quickfacts.census.gov, February 24, 2004.

shows the population growth in each planning area and for the entire county from 1980. Starting in 1980 at a population of 299,684, the county grew at an annual rate of 2.62 percent to 388,222 residents by 1990 - an increase of 88,538 residents. From 1990 to 2000 the county grew at an annual rate of 1.68 percent to a population of 458,614 - an increase of 70,392 residents. The unincorporated area of Sonoma County, outside of the City Urban Service Areas, grew from 97,631 in 1980 at an annual rate of 2.28 percent to 122,377 by 1990, and again from 1990 to 2000 at an annual rate of 0.50 percent to 128,596. The net population change in the unincorporated areas reflects losses due to annexation of land as well as growth attributable to new residential development. [9] Since the adoption of the existing *General Plan* in 1989, significant changes to the population in and amount of unincorporated land resulted from the incorporation of the Town of Windsor in 1992 and annexation of land by the county's nine cities.

Draft GP 2020 Projected Growth

Exhibit 3.0-4 shows 2000 and projected 2020 population and housing growth for the county, including unincorporated areas and the nine cities. In the nine cities, growth is the result of both new residential development and annexations of existing residential development at the edges of the cities. Net population changes in unincorporated areas include losses due to these annexations as well as growth attributable to new residential development.

The *Draft GP 2020* projects that the population in Sonoma County would increase from 458,614 in 2000 at an annual rate of 0.88 percent to 546,030 residents in 2020, an increase of 87,416 residents. This would place 73 percent of Sonoma County's total population in the nine cites. In the unincorporated area of Sonoma County population would increase from 128,596 in 2000 at an annual rate of 0.69 percent to 147,660 residents in 2020, an increase of 19,064 residents accounting for 27 percent of the total county population.

The *Draft GP 2020* projects the number of housing units in Sonoma County would increase from 183,153 in 2000 to 221,640 in 2020, an increase of 38,487 housing units. Of this growth, the *Draft GP 2020* projects a housing unit increase in the nine cities from 2000 to 2020 of 31,143 to 157,851. This would place 71 percent of Sonoma County's housing units in cities. Growth in the unincorporated area from 2000 to 2020 is projected to reach 63,789 housing units, an addition of 7,344 housing units accounting for 29 percent of the total number of county housing units. [10]

Projected *Draft GP 2020* population and housing growth for each of the nine planning areas is discussed below. These projections are based upon the assumption that the City Urban Service Areas would be annexed during the time frame of the General Plan.

Sonoma Coast / Gualala Basin Planning Area

In this planning area population would increase from 8,417 in 2000 to 11,700 in 2020, an increase of 3,283 residents. The number of housing units would increase from 6,131 in 2000 to 7,508 in 2020, an increase of 1,377 housing units.

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9 *Sonoma County General Plan 2020, Public hearing Draft,* PRMD, October 28, 2004.

10 *Sonoma County General Plan 2020, Public hearing Draft,* PRMD, October 28, 2004

Exhibit 3.0-4
Housing and Population Growth 2000 – 2020

Planning Area	Housing Units			Population		
	2000	2020	Change	2000	2020	Change
Sonoma Coast	6,131	7,508	1,377	8,417	11,700	3,283
Cloverdale	5,004	7,085	2,081	12,751	18,460	5,709
Cloverdale USA	2,782	4,264	1,482	7,052	11,200	4,148
Unincorporated	2,222	2,821	599	5,699	7,260	1,561
Healdsburg	14,883	18,773	3,890	40,796	51,460	10,664
Healdsburg USA	4,589	5,288	699	11,253	13,160	1,907
Windsor USA	7,733	10,444	2,711	22,744	30,300	7,556
Unincorporated	2,561	3,041	480	6,799	8,000	1,201
Russian River	9,345	10,343	998	16,462	18,960	2,498
Santa Rosa	73,200	90,267	17,067	190,748	223,400	32,652
Santa Rosa USA	63,077	78,961	15,884	165,849	195,300	29,451
Unincorporated	10,123	11,306	1,183	24,899	28,100	3,201
Sebastopol	11,915	12,725	810	29,198	31,720	2,522
Sebastopol USA	3,953	4,447	494	8,108	9,620	1,512
Unincorporated	7,962	8,278	316	21,090	22,100	1,010
Rohnert Park	20,649	26,074	5,425	53,574	65,040	11,466
Rohnert Park USA	16,013	20,120	4,107	42,236	50,400	8,164
Cotati USA	3,015	3,936	921	7,279	9,600	2,321
Unincorporated	1,621	2,018	397	4,059	5,040	981
Petaluma	24,506	27,814	3,308	66,789	76,300	9,511
Petaluma USA	20,754	23,728	2,974	55,743	64,200	8,457
Unincorporated	3,752	4,086	334	11,046	12,100	1,054
Sonoma Valley	17,520	21,051	3,531	39,879	48,990	9,111
Sonoma USA	4,792	6,663	1,871	9,754	14,590	4,836
Unincorporated	12,728	14,388	1,660	30,125	34,400	4,275
County Total	183,153	221,640	38,487	458,614	546,030	87,416
City	126,708	157,851	31,143	330,018	398,370	68,352
Unincorporated	56,445	63,789	7,344	128,596	147,660	19,064

Source: *Sonoma County General Plan 2020 Public Hearing Draft*, PRMD, October 28, 2004.

Cloverdale / NE County Planning Area

In this planning area population would increase from 12,751 in 2000 to 18,460 in 2020, an increase of 5,709 residents. The number of housing units would increase from 5,004 in 2000 to 7,085 in 2020, an increase of 2,081 housing units.

In the unincorporated area population would increase from 5,699 in 2000 to 7,260 in 2020, an increase of 1,561 residents. The number of housing units would increase from 2,222 in 2000 to 2,821 in 2020, an increase of 599 housing units.

Healdsburg and Environs Planning Area

In this planning area population would increase from 40,796 in 2000 to 51,460 in 2020, an increase of 10,664 residents. The number of housing units would increase from 14,883 in 2000 to 18,773 in 2020, an increase of 3,890 housing units.

In the unincorporated area population would increase from 6,799 in 2000 to 8,000 in 2020, an increase of 1,201 residents. The number of housing units would increase from 2,561 in 2000 to 3,041 in 2020, an increase of 480 housing units.

Russian River Planning Area

In this planning area population increase from 16,462 in 2000 to 18,960 in 2020, an increase of 2,498 residents. The number of housing units would increase from 9,345 in 2000 to 10,343 in 2020, an increase of 998 housing units.

Santa Rosa and Environs Planning Area

In this planning area population would increase from 190,748 in 2000 to 223,400 in 2020, an increase of 32,652 residents. The number of housing units would increase from 73,200 in 2000 to 90,267 in 2020, an increase of 17,067 housing units.

In the unincorporated area population would increase from 24,899 in 2000 to 28,100 in 2020, an increase of 3,201 residents. The number of housing units would increase from 10,123 in 2000 to 11,306 in 2020, an increase of 1,183 housing units.

Sebastopol and Environs Planning Area

In this planning area population would increase from 29,198 in 2000 to 31,720 in 2020, an increase of 2,522 residents. The number of housing units would increase from 11,915 in 2000 to 12,725 in 2020, an increase of 810 housing units.

In the unincorporated area population would increase from 21,090 in 2000 to 22,100 in 2020, an increase of 1,010 residents. The number of housing units would increase from 7,962 in 2000 to 8,278 in 2020, an increase of 316 housing units.

Rohnert Park – Cotati and Environs Planning Area

In this planning area population would increase from 53,574 in 2000 to 65,040 in 2020, an increase of 11,466 residents. The number of housing units would increase from 20,649 in 2000 to 26,074 in 2020, an increase of 5,425 housing units.

In the unincorporated area population would increase from 4,059 in 2000 to 5,040 in 2020, an increase of 981 residents. The number of housing units would increase from 1,621 in 2000 to 2,018 in 2020, an increase of 397 housing units.

Petaluma and Environs Planning Area

In this planning area population would increase from 66,789 in 2000 to 76,300 in 2020, an increase of 9,511 residents. The number of housing units would increase from 24,506 in 2000 to 27,814 in 2020, an increase of 3,308 housing units.

In the unincorporated area population would increase from 11,046 in 2000 to 12,100 in 2020, an increase of 1,054 residents. The number of housing units would increase from 3,752 in 2000 to 4,086 in 2020, an increase of 334 housing units.

Sonoma Valley Planning Area

In this planning area population would increase from 39,879 in 2000 to 48,990 in 2020, an increase of 9,111 residents. The number of housing units would increase from 17,520 in 2000 to 21,051 in 2020, an increase of 3,531 housing units.

In the unincorporated area population would increase from 30,125 in 2000 to 34,400 in 2020, an increase of 4,275 residents. The number of housing units would increase from 12,728 in 2000 to 14,388 in 2020, an increase of 1,660 housing units.

Housing Element: This element presents goals, objectives, policies, and supporting information related to the provision of housing for existing and future residents of the unincorporated areas of Sonoma County. The purpose of the Housing Element is twofold:

- To present specific policies and actions for housing development in the contents of the Land Use Element; and

- To meet regional standards and achieve State certification, pursuant to statutory requirements, which in turn will help the County qualify for State and federal housing aids and grants.

The Housing Element was adopted by the Board of Supervisors on December 11, 2001, amended in January 2002, and certified as in compliance by the State Department of Housing and Community Development on February 11, 2002. No revisions to the Housing Element are proposed as a part of *GP 2020*. However, some programs in the Housing Element are proposed to be implemented as part of the *GP 2020*, including selection of future affordable housing sites and the addition of policies supporting Mixed Use, Single Room Occupancy Units, and Occupancy in RV Parks and Campgrounds.

Agricultural Resources Element: This element promotes and encourages agricultural land uses and continues to define agriculture as an industry which produces and processes food, fiber, plant materials, and which includes the raising and maintaining of livestock and farm animals, including horses. The element would provide guidelines for land use decisions in agricultural areas including policies and programs that promote and protect the current and future needs of the agricultural industry. The *Draft GP 2020* would continue the use of three agricultural land use categories – diverse agriculture, land extensive agriculture, and land intensive agriculture.

Policies would address marketing of agricultural products, stabilization of agricultural use at the edge of urban areas, limitations on intrusion of residential uses, minimizing conflicts between agricultural and nonagricultural uses, the location of agricultural services and visitor-serving uses, provision of farm worker housing, protecting aquaculture and the commercial fishing industry plus the horse industry, and the streamlining of permit procedures for agricultural uses.

Open Space and Resource Conservation Element: This element is a consolidation of the previously separate Open Space Element and Resource Conservation Element. It provides for the conservation and preservation of open space lands and includes a set of nine maps, one for each planning area, that depict areas subject to open space and resource conservation policies. It also includes an implementation program.

There are four classifications of open space – scenic resources, biotic resources, outdoor recreation, and archaeological/historical resources. The scenic resources component would include three open space categories, community separators, scenic landscape units, and scenic highway corridors. In regard to biotic resources, the element would include policies for four critical habitat areas (special-status species habitat, marshes and wetlands, sensitive natural communities, and habitat connectivity corridors) plus policies for riparian corridors. The element would also include policies in regard to soil resources, timber resources, mineral resources, energy resources, air resources, outdoor recreation, and archaeological/historical resources.

Water Resources Element: This element is a new element which is designed to address Sonoma County's water resource issues in a comprehensive manner. Policies would address water quality, groundwater, public water systems, the conservation and re-use of water, importing and exporting of water, and watershed management.

Public Safety Element: This element would include special limitations and procedures for review of development projects located in areas subject to natural hazards. The hazards addressed would include seismic and other geologic hazards, flooding, and susceptibility to wildland fires. Hazardous materials would also be included in this element.

Circulation and Transit Element: This element addresses the location and extent of planned transportation routes and facilities in Sonoma County. It is correlated with the land use element to assure that the transportation system services the future travel demand and helps attain the desired land use plan plus helps achieve a sustainable circulation and transit system. In addition to supporting a highway system that would serve projected highway travel demand at acceptable levels of service the element supports development of the Sonoma Marin Area Rail Transit (SMART) between Cloverdale and a San Francisco bound ferry terminal in Marin County.

Air Transportation Element: This element would express policies related to the public use airports in the county, including compatibility of land uses in adjacent areas. The plan would focus on the Sonoma County Airport and express policies related to the types and amounts of aviation activities to be accommodated and facilities needed to serve them.

Public Facilities and Services Element: The various public services which may affect the future development of land would be included in this element. The public services are: water, wastewater, public education, parks and recreation, fire protection, solid waste management, utilities, and youth and family services. The element's purposes would be to establish policy regarding the provision of these services and to integrate public service concerns into land use decision making.

Noise Element: This element would evaluate existing and projected future noise conditions related to highways, airports, and other sources and expresses policies and standards to assure noise compatibility with future land use development.

ZONING CODE REVISIONS

Adoption of the *GP 2020* would also affect the County's Zoning Code and zoning applied to selected properties. Code changes are proposed concurrently with the *GP 2020* that would apply to the following issues:

- ***Air Transportation Element*** – An Overlay Zoning District is proposed to be created and applied to properties surrounding the public use airports in the county for the purpose of increased protection of the airport environs from incompatible uses.

- ***Affordable Housing Sites*** – An Overlay Zoning District is proposed to be created and applied to selected properties in Urban Service Areas in order to implement a program in the adopted Housing Element.

- ***Land Use Changes*** – Zoning is proposed to be changed on certain properties to conform to any land use map amendments that are approved as part of *GP 2020*.

- ***Zoning Code and map changes*** would also be required following the adoption of the *GP 2020* in order for the Code to be consistent with the updated General Plan. Designation of Community Separators, Scenic Landscape Units, Biotic Resource Areas, and text amendment to implement policies regarding energy resources, rural and urban development guidelines, siting of churches and schools, etc. are examples.

4.0 ENVIRONMENTAL SETTING, IMPACTS, AND MITIGATION MEASURES

4.0 ENVIRONMENTAL SETTING, IMPACTS, AND MITIGATION MEASURES

This chapter contains an analysis of the environmental topics identified by Sonoma County's scoping process for the EIR (Initial Study and Notice of Preparation) described in ***Chapter 1.0 Introduction***. Environmental topics addressed in this chapter include:

- 4.1 Land Use, Population, and Housing
- 4.2 Transportation
- 4.3 Air Quality
- 4.4 Noise
- 4.5 Hydrology and Water Resources
- 4.6 Biological Resources
- 4.7 Geology / Soils
- 4.8 Agricultural and Timber Resources
- 4.9 Public Services
- 4.10 Cultural Resources
- 4.11 Visual Resources
- 4.12 Energy
- 4.13 Hazardous Materials

Sections 4.1 through 4.13 of this chapter describe existing environmental conditions as they relate to each specific topic, identify potential impacts from implementing the *Draft GP 2020*, and present mitigation measures required to reduce significant adverse impacts to a less-than-significant level.

This EIR evaluates cumulative impacts under two scenarios. The first are cumulative impacts that would occur in the unincorporated area of Sonoma County under the *Draft GP 2020*. Each of the topical impact assessments in this EIR (i.e., Sections 4.1 through 4.13) takes into consideration, where applicable, the cumulative impacts of the *Draft GP 2020*. For these cumulative analyses the geographic area of concern is the unincorporated area of Sonoma County.

In addition to impacts that are cumulatively significant under the *Draft GP 2020*, there is an additional level of cumulative impact resulting from growth in the unincorporated portion of Sonoma County together with projected growth in each of the nine cities. For this cumulative analysis the geographic area of concern is Sonoma County. These cumulative impacts are discussed in ***Section 6.2 Cumulative Impacts.***

CEQA requires an EIR for a general plan to consider the impacts of the *proposed plan* against the existing physical environment. Limiting the analysis to a comparison of the potential development under the proposed general plan with the potential development under the existing general plan is not appropriate.[1] CEQA does not require the evaluation of the impacts of a proposed project on an existing general plan. Rather, it concerns itself with the impacts of the project on the environment, defined as the existing physical conditions in the affected area. It should be noted that ***Chapter 5.0 Alternatives*** provides a comparison of the impacts that would be expected to occur from land uses and development under continuation of the existing *General Plan* with what would be expected to occur under the *Draft GP 2020*.

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1 See *Environmental Planning & Information Council v. County of El Dorado* ("*EPIC*") (1982) 131 Cal.App.3d 350.

FORMAT OF TOPICAL ANALYSES

Each of the topical impact assessments in this EIR (Sections 4.1 through 4.13) are organized as follows:

Environmental Setting

Existing conditions are described in the respective "setting" sections. These descriptions summarize information compiled during the study process to prepare the EIR. Background materials used in the EIR are referenced in footnotes and listed in ***Appendix 7.3 Bibliography***.

Regulatory Setting

A discussion of relevant regulatory conditions is provided.

Significance Criteria

Standards used to evaluate the magnitude of impacts are listed in the "significance criteria" subsections for each topic analyzed. Under CEQA, a *significant effect* is defined as a substantial or potentially substantial adverse change in the environment- namely, in any of the "physical conditions within the area affected by the project including land, air, water, minerals, flora, fauna, ambient noise, and objects of historic or aesthetic significance". The *State CEQA Guidelines* direct that the significance of impact be determined on the basis of scientific and factual data. The significance criteria were derived from the following main sources: the *State CEQA Guidelines*, the existing *General Plan*, environmental documents prepared recently on other projects in Sonoma County, and the professional standards and practices of the technical analysts who conducted the EIR evaluations.

Impacts and Mitigation Measures

The “impacts and mitigation” subsections identify the level and type of impacts that are likely to result from implementation of the *Draft GP 2020*. The generic impacts of potential growth from the land uses and level of development consistent with the *Draft GP 2020* are discussed in addition to any other impacts that might result from the goals and policies of the *Draft GP 2020*.

All impacts are numbered consecutively by topic. Based on the significance criteria, each impact is identified as being either a ***Significant Impact*** or a ***Less-than-Significant Impact***. Significant impacts are followed by feasible mitigation measures that are available to reduce the magnitude of impact. No mitigation measures are required for less-than-significant impacts. Mitigation measures also are numbered to correspond to the respective impacts.

For each significant impact where a feasible mitigation is identified, a conclusion is provided as to whether with the incorporation of the recommended mitigation measure the impact would be reduced

to a less-than-significant level or whether it would be a ***Significant Unavoidable Impact***. A significant unavoidable impact is a significant impact which cannot feasibly be avoided with mitigation. These include impacts which could be partly mitigated but could not be reduced to a less-than-significant level.

For each significant unavoidable impact identified in the Final EIR, Sonoma County would be required to adopt Findings and a Statement of Overriding Considerations explaining the reasons for approving the project (if approved) despite the impacts identified.

4.1 LAND USE, POPULATION, AND HOUSING

4.1 LAND USE, POPULATION, AND HOUSING

Land Use, Population, and Housing – Environmental Setting

This section describes the existing land use patterns in Sonoma County. The nine Planning Areas are described in terms of communities, land uses, and local issues. Land use issues that occur in more than one Planning Area are outlined, including: community change and resources conflicts; gentrification; urban / rural conflicts; development density; sustainability; and certificates of compliance. County, regional, State, and federal regulatory authority over land use is described.

EXISTING LAND USE

Sonoma County has a diverse and unique physical setting, including mountain ridges, hills, and valleys, which are replete with forests, oak woodlands, stream corridors, and tidal and fresh water marshes. It borders on both the Pacific Ocean and the San Pablo Bay. A high density of Native Americans once thrived on abundant wildlife, anadramous fish, and acorns. [1] Beginning early in the 19th Century, the Spanish military, ranchers, and Franciscan missionaries arrived. Russians established agricultural colonies along the coast. Cattle grazing, the introduction of annual grasses and the reduction of large wildlife species irretrievably changed the landscape. Mexico ruled the land. In 1846, the Anglo-American immigrants who had been coming to California led the Bear Flag Revolt at Sonoma. The subsequent Gold Rush of 1849 initiated a major migration to California.

California gained statehood in 1851. Sonoma County's growth following that time was strongly tied to the Gold Rush impacts on San Francisco. Sonoma County supplied lumber, other building materials, and various food products to San Francisco, a short boat ride away. As this part of the economy grew, business services grew; the county's communities diversified along its farmers, lumbermen, and miners. Summer home communities developed along the Russian River as tourism began to play a role in the local economy. With the completion of the Golden Gate Bridge in 1937, Marin County and southern and central Sonoma County became the site for tract home subdivisions in the 1950s and 1960s.

The demand for subdividing rural land was also spurred by the growth to the north of San Francisco. Requirements were limited to surveying and filing parcel maps for four or fewer parcels, which were often split again into four. Road access and proof of water and on-site waste disposal capacity was required for five or more parcels, but the filing of serial parcel maps was a way around those requirements. By the mid-1960s, the county's cities became stressed by the post World War II growth. A proposed nuclear power plant on Bodega Head was defeated, while large portions of both the Marin and Sonoma coasts were preserved as parkland.

The County and its cities created new land use tools, including general plans, specific plans, zoning ordinances, and subdivision and building controls. The County's initial and subsequent general plans

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[1] For further description of historical land use in Sonoma County, refer to *Sonoma County Land Use Audit – Draft Report*, Economic & Planning Systems, Inc., prepared for Greenbelt Alliance and Sonoma County Farm Bureau, October 2003.

established a *city-centered* development pattern, in order to direct future growth to cities and to protect the surrounding agricultural and resource lands. The existing *General Plan* continued the policy of locating *Community Separators* that provide open space between cities. Since 1989, except for Cloverdale, all incorporated cities have established voter-approved urban growth boundaries. There are nine incorporated cities in Sonoma County; the Town of Windsor was the last city to incorporate in 1992.

The majority of the Sonoma County population lives in cities along US 101. Designated Community Separators provide separation between cities. Beyond the main corridor, the City of Sonoma is located on Highway 12 in the southeast and the City of Sebastopol is located west of the US 101 corridor on Highway 116. The county's 12 unincorporated communities are concentrated along these three main highway corridors, though the area beyond Sebastopol and the coastal communities also contain small, yet notable concentrations of unincorporated growth. The infrastructure systems that support and constrain continued growth and development in the county include not only highways and roads, but water and wastewater systems and flood control facilities.

Sonoma County's development pattern is typical for some of California's rural counties, with low density land uses in small towns and much land devoted to rural residential development in outlying areas. One study determined Sonoma County to be the highest ranked "small parcel" county in California, reflecting the past history of small parcel development throughout much of the county's natural, agricultural, and forest areas. This has created a land use pattern where much of the county land area experiences an interface between wildlands or agriculture and homes. Individual management of large rural lots and small farms and vineyards will shape the future functionality of wildlife habitat and vegetative and water systems. [2]

According to State Department of Conservation data, about 71,000 acres or seven percent of the county's 1,026,060 acres are developed at a density of at least 1.5 units per acre (termed *urbanized*). [3] The majority of this urbanized land, 45,000 acres, is within the spheres of influence of the nine cities. [4] While most of the urbanized area is residential, about five percent of the urbanized area is developed for industrial and commercial use. Roads, schools, and other infrastructure account for a significant proportion of the urban acreage.

Farmland (17 percent) and grazing land (41 percent) account for a total of 58 percent of the county's land area, with the other land and water areas comprising 35 percent of the county. This 35 percent includes lower-density (more than 1.5 acres per unit) rural residential development areas and timberlands.

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2 *Patterns of Settlement Density in Selected Counties, FRAP Analysis of 1990 Census Data*, California Department of Forestry, 1997.

3 *Sonoma County 1998-2000 Land Use Conversion*, State Department of Conservation Farmland Mapping and Monitoring Program, data as of 2000.

4 *Sonoma County Land Use Audi - Draft Report t,* prepared for Greenbelt Alliance and Sonoma County Farm Bureau, Economic & Planning Systems, Inc., October 2003.

Within the entire county, including the cities, the uses of land are estimated as follows:

- Urbanized 7 percent
- Grazing land 41 percent
- Important Farmland 17 percent
- Timber / Other Lands 33 percent
- Water Bodies 2 percent.
- **Total 100 percent** [5]

Existing and projected 2020 population and housing growth with the *Draft GP 2020* are provided in ***Chapter 3.0 Project Description***.

LAND USE PLAN DESIGNATIONS

Exhibit 4.1-1 shows the acreage of the existing *General Plan* land use designations by Planning Area. For unincorporated Sonoma County, lands designated agriculture account for 34 percent or 329,562 acres. Lands designated for resources and rural development account for 51 percent, or 492,658 acres. Residential lands account for 81,895, or nine percent. Commercial and industrial lands individually account for less than one percent. Public lands are six percent, or 55,723 acres, while incorporated cities are 44,237 acres, or three percent of total county acres.

These land use plan designations form the foundation of the existing *General Plan* and are the primary tool utilized to implement the major goals of city and community centered growth and the protection of agriculture.

Agricultural and Other Resource Land Uses

The existing *General Plan* land use plan includes three agricultural land use categories: *Land Intensive Agriculture (LIA), Land Extensive Agriculture (LEA),* and *Diverse Agriculture (DA).* Designation of parcels was based on multiple considerations, including the parcel size, lack of infrastructure, distance from public services, access, conflicts with resource conservation and production, and topographic and environmental features.

The existing *General Plan* land use plan also uses the *Resources and Rural Development (RRD)* designation to protect the county's natural resource lands and allow only very low density residential development. Resources to be protected include commercial timber lands, lands within the Known Geothermal Resource Area (KGRA), lands identified in the County's *Aggregate Resources Management Plan,* and natural resource lands including watershed, fish and wildlife habitat, and other biotic areas.

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5 *Sonoma County 1998-2000 Land Use Conversion,* State Department of Conservation Farmland Mapping and Monitoring Program, data as of 2000.

Exhibit 4.1-1
Acreage of Land Use Category Designation by Planning Areas

Land Use	*Sonoma Coast / Gualala Basin*	*Cloverdale / N.E. County*	*Healdsburg & Environs*	*Russian River Area*	*Santa Rosa and Environs*	*Sebastopol & Environs*	*Rohnert Park – Cotati & Environs*	*Petaluma & Environs*	*Sonoma Valley*	*Total County*
Agricultural Land Uses										
Diverse Agriculture	1,349 (0.5%)	932 (0.5%)	6,034 (6.2%)	5,648 (9.3%)	14,481 (15.0%)	16,184 (36.6%)	4,448 (26.8%)	11,181 (13.0%)	8,588 (9.5%)	68,845 (7.1%)
Land Extensive Agriculture	29,178 (10.5%)	40,113 (20.3%)	1,185 (1.2%)	709 (1.2%)	8,733 (9.0%)	14,570 (32.9%)	1,934 (11.7%)	63,995 (74.2%)	26,046 (28.8%)	186,462 (19.3%)
Land Intensive Agriculture	233 (0.1%)	24,476 (12.4%)	23,169 (23.6%)	3,481 (5.7%)	6,213 (6.4%)	448 (1.0%)	0 (0.0%)	246 (0.3%)	15,988 (17.7%)	74,255 (7.7%)
Ag Totals	*30,760 (11.1%)*	*65,521 (33.2%)*	*30,387 (31.0%)*	*9,838 (16.2%)*	*29,427 (30.5%)*	*31,202 (70.6%)*	*6,382 (38.5%)*	*75,423 (87.4%)*	*50,622 (56.1%)*	*329,562 (34.1%)*
Resources & Rural Development Land Use										
RRD	222,752 (80.5%)	110,898 (56.2%)	63,313 (64.6%)	38,026 (62.6%)	31,510 (32.7%)	2,066 (4.7%)	3,624 (21.9%)	291 (0.3%)	20,179 (22.3%)	492,658 (51.0%)
Residential Land Uses										
Rural Residential	10,398 (3.8%)	2,081 (1.1%)	3,696 (3.8%)	6,077 (10.0%)	19,660 (20.4%)	10,295 (23.3%)	5,758 (34.8%)	7,465 (8.7%)	10,157 (11.2%)	75,588 (7.8%)
Urban Residential	130 (0.0%).	76 (0.0%)	48 (0.0%)	1,146 (1.9%)	2,362 (2.4%)	202 (0.5%)	315 (1.9%)	2 (0.0%)	2,028 (2.2%)	6,307 (0.7%)
Residential Totals	*10,528 (3.8%)*	*2,157 (1.1%)*	*3,744 (3.8%)*	*7,223 (11.9%)*	*22,021(22.8%)*	*10,497(23.7%)*	*6,073(36.7%)*	*7,467(8.7%)*	*12,185(13.5%)*	*81,895 (8.5%)*
Commercial Land Uses										
Recreation / Visitor-Serving Commercial	353 (0.1%)	268 (0.1%)	15 (0.0%)	339 (0.6%)	184 (0.2%)	23 (0.1%)	0 (0.0%)	1,067 (1.2%)	281 (0.9%)	2,530 (0.3%)
General Commercial	8 (0.0%)	4 (0.0%)	0 (0.0%)	0 (0.0%)	134 (0.1%)	3 (0.0%)	11 (0.1%)	61 (0.1%)	20 (0.0%)	241 (0.0%)
Limited Commercial	184 (0.1%)	46 (0.0%)	15 (0.0%)	213 (0.4%)	148 (0.2%)	165 (0.4%)	45 (0.3%)	138 (0.2%)	214 (0.2%)	1,167 (0.1%)
Limited Commercial Traffic Sensitive	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	22 (0.0%)	22 (0.0%)
Commercial Totals	*545 (0.2%)*	*317 (0.2%)*	*29 (0.0%)*	*553 (0.9%)*	*465 (0.5%)*	*191 (0.4%)*	*56 (0.3%)*	*1,266 (1.5%)*	*537 (0.6%)*	*3,960 (0.4%)*

Land Use	***Sonoma Coast / Gualala Basin***	***Cloverdale / N.E. County***	***Healdsburg & Environs***	***Russian River Area***	***Santa Rosa and Environs***	***Sebastopol & Environs***	***Rohnert Park – Cotati & Environs***	***Petaluma & Environs***	***Sonoma Valley***	***Total County***
Industrial Land Uses										
General Industrial	*0* *(0.0%)*	*0* *(0.0%)*	*1* *(0.0%)*	*0* *(0.0%)*	*557* *(0.6%)*	*23* *(0.1%)*	*0* *(0.0%)*	*83* *(0.1%)*	*0* *(0.0%)*	*663* *(0.1%)*
Limited Industrial	*37* *(0.0%)*	*604* *(0.3%)*	*47* *(0.0%)*	*32* *(0.1%)*	*876* *(0.9%)*	*20* *(0.0%)*	*50* *(0.3%)*	*24* *(0.0%)*	*359* *(0.4%)*	*2,049* *(0.2%)*
Industrial Totals	*37 (0.0%)*	*604 (0.3%)*	*48 (0.0%)*	*32 (0.1%)*	*1,433 (1.5%)*	*42 (0.1%)*	*50 (0.3%)*	*107 (0.1%)*	*359 (0.4%)*	*2,712 (0.3%)*
Public / Quasi Public Land Use										
Public / Quasi Public	12,193 (4.4%)	17,679 (9.0%)	453 (0.5%)	5,030 (8.3%)	11,640 (12.1%)	222 (0.5%)	382 (2.3%)	1,703 (2.0%)	6,420 (7.1%)	55,723 (5.8%)
Planning Area Subtotal	*276,815* *(100%)*	*197,177* *(100%)*	*97,974* *(100%)*	*60,701* *(100%)*	*96,496* *(100%)*	*44,220* *(100%)*	*16,558* *(100%)*	*86,257* *(100%)*	*90,302* *(100%)*	*966,000* *(100%)*
City Acreage	*0*	*1,341*	*6,314*	*0*	*22,384*	*1,015*	*4,303*	*7,404*	*1,476*	*44,237*
County Total	*276,815*	*198,517*	*104,288*	*60,701*	*118,880*	*45,235*	*20,871*	*93,662*	*91,778*	*1,010,747*

Residential Land Uses

The existing *General Plan* Land Use Plan includes two residential land use categories: *Urban Residential* and *Rural Residential*. Maximum residential densities are shown on the Land Use Plan Map. The Urban Residential category is used only within urban service areas. Sonoma County has a past history of dispersed rural residential development that has resulted in scattered concentrations of smaller two- to ten-acre lots. These areas are typically designated Rural Residential.

Rural Residential designated areas provide for very low density residential development on lands that have few if any urban services, but have access to county maintained roads. Approximately eight percent of the total county acreage, or 75,588 acres are designated Rural Residential. Found throughout the county, Rural Residential areas are both in close proximity to urban areas and in isolated rural pockets. Countywide, of these Rural Residential lands, slightly more than half are zoned Agriculture and Residential (AR) while the remaining are zoned Rural Residential (RR). Rural Residential lands that are zoned AR are mostly located in the west and south county, including west of Petaluma, south and west of Sebastopol, Joy Road, Forestville, Penngrove, and east of Sonoma.

An increasing number of agricultural uses are being conducted on smaller parcels in the Rural Residential land use category, including those that are zoned AR and RR. These small farms are making an increasingly important contribution to agriculture, as well as helping to maintain the traditional rural character of the county. Many of these small farms are located in areas of good climate and soils, and have been used for agricultural purposes in the past. These smaller farms can contribute to the agricultural production value of the county, especially in certain niche markets. There is a land use issue regarding whether these small farm operations should be recognized as agriculture, and, if so, to what extent they should enjoy protections similar to those currently in effect on agricultural lands. [6]

Commercial and Industrial Land Uses

The land use plan includes three categories of commercial uses.

- *General Commercial* permits all types of commercial use and is applied only to lands within urban service areas;

- *Limited Commercial* allows a smaller range of commercial uses and is applied to areas either outside or inside urban service areas; and

- *Recreation and Visitor Serving Commercial* allows for visitor serving uses including restaurants, lodging, campgrounds, resorts, marinas, and golf courses. Its purpose is to limit this type of development to appropriate sites.

The land use plan includes two industrial use categories, designating lands needed to provide jobs and services for county residents and businesses.

- *General Industrial* allows all industrial uses but only within urban service areas; and

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6 *Rural Residential Lands as Agriculture*, CAC memo, Greg Carr, Sonoma County PRMD, September 19, 2002.

- *Limited Industrial* allows a smaller range of uses and may also be applied outside urban service areas.

Public / Quasi Public Land Use

This land use category recognizes sites that serve community or public need and are owned or operated by government agencies, non profit entities, or public utilities. Minor facilities are allowed in any land use category where they are compatible with the neighborhood character and preservation of natural and scenic resources. The *Public / Quasi Public* (P/QP) category is used for larger facilities, including parks, public schools, wastewater treatment facilities, institutional uses (Sonoma Development Center and Sonoma State University), and military facilities (Two Rock Coast Guard Station). These facilities can only receive a P/QP designation after acquisition has taken place. The existing *General Plan* pre-designates public uses such as schools, parks, wastewater management facilities or solid waste disposal facilities using a symbol in the general location where there is a need for certain facilities. [7]

COMMUNITY CHANGE AND RESOURCE CONFLICTS

The beauty and variety of Sonoma County's natural environment has long attracted migration to the county. Beginning in the 1970s, significant changes have occurred in the use of natural and agricultural lands within the county. Continued population growth; an increase in viticulture, wineries, and tourism; and the development of larger homes and rural estates are predominant factors in recent land use changes. [8]

In general, California's agricultural lands have experienced the greatest proportional change until now, while future growth is expected to shift more towards rangelands and forests. [9] Sonoma County is following a similar trend, with development pressures encroaching further into remote areas. However, Sonoma County's restrictive rural land use policies have minimized this trend. In general, this type of development results in two primary environmental consequences: habitat loss and fragmentation, and the degradation of water resources and water quality. [10]

The overall success of the agricultural sector combined with Sonoma County's efforts to preserve it, has facilitated urban center growth. Such growth has contributed to the avoidance of sprawl and the reduction of growth pressure in the unincorporated area.

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7 *Public Facilities Designation and Development Process,* CAC memo, Richard Rogers, PRMD, July 17, 2003.

8 *Sonoma County's Countryside: a destination for the wealthy,* Tom Chorneau and Matt Weiser, Press Democrat, May 6, 2001.

9 *Development and Vegetation Trends,* Technical Working Paper, James G. Spero, Fire and Resources Assessment Program (FRAP), California Department of Forestry, 2001.

10 *Our Built and Natural Environments – A Technical Review of the Interactions between Land Use, Transportation, and Environmental Quality,* U.S. EPA, January 2001.

Gentrification

Existing land use designations and zoning curtail growth in rural areas and direct development toward cities. While building is allowed on existing parcels as small as one acre, the majority of rural home construction requires 20 to 600 acres per home. Parcels of 40 acres and larger that were once considered undesirable for development now are attractive locations for large homes and rural estates. These expensive homes are sometimes used as second homes, but not exclusively. Open space and agricultural lands have been protected to a degree by County land use policies, but these large rural parcels are becoming more expensive as land values have increased. The number of new rural homes built in the county with a construction cost of more than $250,000 went from ten in 1996 to 43 in 2000. Also, the average size of new homes increased 32 percent during the last five years, from 2,493 square feet in 1996 to 3,290 square feet in January 2001. [11]

There is still some limited capacity for more population in the urbanized communities of the unincorporated county, including the communities of Forestville, Penngrove, and Boyes Hot Springs, depending on the continuing availability of sewer and water.

Urban / Rural Conflicts

Rural lands are valued both for vineyards and as attractive home sites, indicating that agricultural and residential conflicts will increase. [12] Over the past decade, during the increase in premium grape vineyard development in the county, agricultural land with the ability to be converted into vineyards attained a similar value compared to land used for residential development. There is no guarantee, however, that high agricultural land values will continue to help hold the line against future residential development pressures. [13]

As people continue to move into rural areas, conflicts also arise in the county's dispersed rural residential areas where parcels range from two to ten acres. Many of these parcels, located within the Rural Residential land use category, are suitable for small scale agricultural uses. Some are zoned Agriculture and Residential, which generally allows unlimited animal and crop production. Others are zoned Rural Residential, which limits agricultural activities. With the growth of the organic produce industry, smaller parcels have become attractive for growing vegetables and other crops, as well as for marketing activities to directly reach the consumer. Conflicts arise when area residents not connected with agriculture are exposed to noise, odors, traffic and other activities associated with agriculture. [14]

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11 *Sonoma County's Countryside: a destination for the wealthy,* Tom Chorneau and Matt Weiser, The Press Democrat, May 6, 2001.

12 *Modeling future development for Sonoma County, California: The Consequence of Agricultural Land Protection Policies for Habitat Conservation,* Adina Merenlender, Colin Brooks, David Shabazian, Shengy Gao, and Robert Johnston, U.C. Berkeley, Hopland Research and Extension Center, Sacramento Area Council of Governments, and U.C. Davis, 2003.

13 Nichols•Berman communication with Adina Merenlender, University of California Berkeley, April 2003.

14 *Rural Residential Lands as Agriculture*, CAC memo, Greg Carr, Sonoma County PRMD, September 19, 2002.

Density of Development

Most counties surrounding the San Francisco Bay Area exemplify a different pattern of development than the more saturated metropolitan sprawl of Southern California. San Francisco is an anomaly among California counties, at 16,634 persons per square mile, the most densely populated county in the State. Orange County is the second, at 3,606 persons per square mile, with Los Angeles the third, at 2,344 persons per square mile. Bay Area counties range from Alameda County, the fourth densest in the State, with 1,957 persons per square mile, to Napa County at 165 persons per square mile. Sonoma County population density is the second lowest in the Bay Area, at 291 persons per square mile. [15]

In addition to impacts on natural resources and urban / rural land use impacts, a lack of concentrated development makes most people in the county dependent on automobiles for mobility and results in more acreage needed for roads, parking lots, etc. for housing, commercial and public services, and jobs. This dispersion results in an increase in the average amount of land consumed by each new dwelling unit.

Certificates of Compliance

Over the past decade, the resurrection of antiquated parcels through the Certificate of Compliance process has conflicted with the policies of the existing *General Plan.* The County has over 5,000 lots that result from early government land patents. These lots vary from 40 to 160 acres but are located in areas designated for densities of 160 to 320 acres. There are also close to 75,000 lots depicted in old subdivision maps recorded prior to modern State Subdivision Map Act laws, lots created without any regard to location, topography, access, their buildability, or provision of public services. Some of these parcels may be reconfigured through lot line adjustments. [16] The existing *General Plan* does not contain policies specific to antiquated parcels or certificates of compliance. [17] However, the County has attempted to respond to this concern by adopting several amendments to the County Code to provide more control over the development of antiquated parcels through lot line adjustments. Senate Bill 497, effective January 1, 2002, allows a jurisdiction to attach conditions of approval to lot line adjustments to assure compliance with building and zoning codes, as well as General Plans and Coastal Programs. Also, adjustments of five or more parcels now must be processed as a subdivision. The county prevailed in a 2003 court decision, County of Sonoma vs. Gardner, which confirmed the current practice of the County with regard to denying certificates of compliance based upon old subdivision maps.

THE DRAFT GP 2020 LAND USE DESIGNATIONS

The *Draft GP 2020* continues the County's use of *Planning Areas* to delineate and plan for different regions of the county. **Exhibit 3.0-2** depicts the County's nine Planning Areas.

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15 *Population, Housing Units, Area, and Density,* U.S. Census Bureau, 2000 data.

16 Nichols•Berman communication with Sue Gallagher, Sonoma County Counsel's Office, February 2003.

17 *Certificates of Compliance,* CAC memo, Dave Schiltgen, Sonoma County PRMD, Dec. 19, 2002.

Land Use Map Amendments

The *Draft GP 2020* proposes minimal changes to the land use map in the existing *General Plan*, based on the desire to maintain the County's long standing goals of city-centered growth and agricultural protection. Proposed *Draft GP 2020* land use amendments were considered if they advanced a broader public goal and were consistent with the goals, objectives, and policies of the final plan. These amendments included changes that involved the review of the following issues:

- Review of Urban Service Boundaries to reflect city Urban Growth Boundaries and General Plans, LAFCO decisions, and approval of new wastewater systems;
- Changes to reduce or avoid further traffic congestion;
- Re-use of public properties for private use, including Skaggs Island and the Sonoma Development Center;
- Designation of sites for agriculture-related commercial uses to address the issue of visitor serving and support uses on agricultural lands;
- Designation of some Rural Residential lands as Agriculture to support agricultural uses on smaller parcels;
- Better accommodation for public facilities, including churches and schools; and
- Additional Recreation and Visitor-Serving Commercial sites.

Other land use map amendment considerations involve technical correction, non-conforming uses, and other changes necessary to be consistent with concurrent policy changes.

The following specific screening criteria were used by PRMD staff and the Citizens Advisory Committee in 2003 to evaluate requests for land use map amendments:

- All land use map amendments that are considered should advance a broader public interest and be consistent with the framework of goals, objectives, and policies of the *GP 2020*.
- All land use map amendments shall fit under at least one of the following categories (i.e., criteria):

    1. Those amendments that are needed to address an issue that is included in the Final Work Plan for General Plan Update 2020;
    2. Those amendments that are needed to address technical corrections and non-conforming uses where such uses are consistent with surrounding uses and community character;
    3. Those amendments that are needed to be consistent with a concurrent policy change; or

4. Those amendments that are needed to address development or construction of a new or revised use involving a public facility of substantial public benefit or importance. [18]

Exhibit 4.1-2 shows the proposed Land Use Amendments by Planning Area. This exhibit shows the request number, owner / applicant, Assessor's Parcel Number, size, location, land use map amendment request, existing land use designation and uses, existing zoning, which screening criteria the request meets, and the net change if the request is eventually approved and implemented.

Specific land use policies were developed for each Planning Area to implement broader County goals and objectives. Land use policies for each Planning Area are in the Land Use Element. Separate maps in the *Draft GP 2020* (see Figures LU 2a through LU 2i in the Land Use Element) show applicable land use categories and maximum permitted residential density for each parcel.

Exhibit 4.1-3 shows the existing and proposed acreage for all of the land use designations.

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[18] *Land Use Element- Requests for Land Use Map Amendments,* CAC memo, Lisa Posternak, Sonoma County PRMD, July 10, 2003.

Exhibit 4.1-2
Draft GP 2020 Land Use Amendments

Request No.	Applicant (Owner)	APN (Acres) Location	Land Use Map Amendment Request	Existing Land Use Designation and Use(s)	Existing Zoning	Meets Screening Criteria?	Net Changes if Approved
Sonoma Coast / Gualala Basin Planning Area							
1-1	PRMD (Gonnella)	074-300-017 (0.15) Occidental	Change Land Use Designation and Zoning to LC and LC HD SR.	RR 10 Occidental Hardware	RR 10 HD SR	Yes, Criterion 2 Non-conforming Use	None
1-2	PRMD (Gonnella)	074-300-009 (0.12) Occidental	Change Land Use Designation and Zoning to LC and LC HD SR.	RR 10 Westpole Bakery	RR 10 HD SR	Yes, Criterion 2 Non-conforming Use	None
1-3	PRMD (County of Sonoma)	074-300-015 (0.34) Occidental	Change Land Use Designation and Zoning to PQP and PF HD SR.	RR 10 Occidental Volunteer Fire Department Station	RR 10 HD SR	Yes, Criterion 2 Non-conforming Use	None
1-4	PRMD (County of Sonoma)	074-300-013 (0.57) 074-300-014 (0.55) Occidental	Change Land Use Designation and Zoning to PQP and PF HD SR.	RR 10 Occidental Community Center and Park	RR 10 HD SR	Yes, Criterion 2 Non-conforming Use	None
1-6	PRMD (Thomas)	074-300-034 (0.31) Occidental	Change land use designation and zoning to PQP and PF HD SR.	RR 10 Occidental Post Office	RR 10 HD SR	Yes, Criterion 2 Non-conforming Use	None

Request No.	***Applicant (Owner)***	***APN (Acres) Location***	***Land Use Map Amendment Request***	***Existing Land Use Designation and Use(s)***	***Existing Zoning***	***Meets Screening Criteria?***	***Net Changes if Approved***
Cloverdale / NE County Planning Area							
2-3	PRMD (Mittelstadt)	116-050-010 (12.22) Cloverdale	Change land use designation and zoning to LI and LI SR.	RR 20 Lumber yard	AR B8 SR	Yes, Criterion 2: Non-conforming Use	None
2-4	PRMD (Holmes)	115-160-011 (1.27) Cloverdale	Change land use designation and zoning to UR 9 and R2 9 du/ac BR SR.	LC Residential	LC BR SR	Yes, Criterion 2: Non-conforming Use	None
2-10	Vanoni	140-100-029 (0.09) Geyserville	Change land use designation and zoning to LC.	UR 6 Pump and irrigation sales and repair	R2 6 du/ac	Yes, Criterion 2: Non-conforming Use.	None
2-11	Geyserville Volunteer Fire Department (County of Sonoma)	140-100-071 (5.36) Geyserville	Change land use designation and zoning to PQP and PF.	RVSC Vacant	K	Yes, Criterion 4: Public Facility	Replace potential recreational and visitor-serving commercial use with 9,300 square feet of public use.
2-15	Sonoma County Transit Agency	140-100-012 (.07) Geyserville	Change land use designation and zoning to PQP and PF.	UR 6 Vacant	R2 6 du/ac	Yes, Criterion 4: Public Facility	None - Visitor center has already been approved.
2-16	PRMD (Parde)	140-180-035 (5.11) Geyserville	Change land use map to show parcel as located within Geyserville Urban Service Area.	LC Vacant	LC SR	Yes, Criterion 2: Technical Correction	Increase in commercial use due to availability of sewer.

Request No.	***Applicant (Owner)***	***APN (Acres) Location***	***Land Use Map Amendment Request***	***Existing Land Use Designation and Use(s)***	***Existing Zoning***	***Meets Screening Criteria?***	***Net Changes if Approved***
Healdsburg and Environs Planning Area							
3-4	Redding (Musante)	120-120-006 (20.46) 120-140-063 (61.49) Calistoga	Change land use designation and zoning to LEA 60 and LEA 60 SR to allow for development of winery to serve Knights Valley vineyards.	RR 20 Residential, pasture, vacant	AR 20 SR	No	Agricultural processing facility (winery).
3-5	Sonoma County Agricultural Protection and Open Space District (SCAPOSD)	028-060-062 (78.78) 028-060-063 (21.62) 028-060-064 (37.00) 028-060-066 (213.26) 028-060-067 (25.20) 028-070-036 (206.34) Santa Rosa	Change land use designation and zoning of portions of parcels pursuant to LLA02-0029 (see below) which will result in placement of land under conservation easement with SCAPOSD. to RRD 100: 028-060-062, 028-060-063, 028-060-064, 028-060-066, 028-060-067 to RRD 60 and RRDWA 60: 028-070-036	RRD 60 RRD 60 RRD 60 RRD 60 RRD 60 RRD 100 Vacant	RRD 60 RRD 60 RRD 60 RRD 60 RRD 60 RRDWA 100	Yes, Criterion 2: Technical Correction	None

Request No.	***Applicant (Owner)***	***APN (Acres) Location***	***Land Use Map Amendment Request***	***Existing Land Use Designation and Use(s)***	***Existing Zoning***	***Meets Screening Criteria?***	***Net Changes if Approved***
Russian River Planning Area							
4-2	Caracappa (Zamlich)	072-100-059 (1.56) Guerneville	Change land use designation and zoning to RVSC and K F1 F2 SR to increase potential for recreational and visitor-serving commercial development.	PQP Vacant	PF F1 F2 SR	Yes, Criterion 2: Technical Correction	Replace potential park or other public use with 33,976 square feet of recreational and visitor-serving use (50% maximum lot coverage).
4-4	Sonoma County Regional Parks Department	082-210-012 (0.31) 082-210-037 (9.66) 082-220-033 (1.61) Forestville	Change land use designation and zoning to PQP and PF F1 SR, PF BR F1 SR, and PF BR F1 SD, respectively, to recognize expansion of Forestville river access and construction of new trail, site improvements, and parking facility.	RR 1.5 RRD 160 RRD 160 Vacant, recreation	RR 1.5 F1 SR RRD 160 BR F1 SR RRD 160 BR F1 SD	Yes, Criterion 4: Public Facility	Replace residential and recreational uses with park.

Request No.	***Applicant (Owner)***	***APN (Acres) Location***	***Land Use Map Amendment Request***	***Existing Land Use Designation and Use(s)***	***Existing Zoning***	***Meets Screening Criteria?***	***Net Changes if Approved***
4-5	Sonoma County Water Agency (SCWA) and Sonoma County Regional Parks Department (Note: should be under Planning Area 3)	066-230-069 (3.20) 066-230-080 (19.83) 066-230-083 (177.80) 110-210-010 (55.72) 110-210-011 (47.04) Guerneville	Change land use designation and zoning to PQP and PF BR F1 pursuant to SCWA purchase of Hanson Aggregates property, to be developed as public Riverfront Park.	LIA 60 Vacant	LIA 60 BR F1 MR Z LIA 60 BR F1 LIA 60 BR F1 LIA 60 BR F1 F2 MR LIA 60 F1 F2 MR	Yes, Criterion 4: Public Facility	Addition of park.
4-6	Leonberger and Mozingo	070-120-027 (0.14) Guerneville	Change land use designation and zoning to LC and LC F2 SR.	UR 1 Restaurant	R1 1du/ac F2 SR	Yes, Criterion 2: Technical Correction	None
4-7	PRMD (Blumhoefer)	070-120-026 (0.03) Guerneville	Change land use designation and zoning to LC and LC F2 SR (see Request 4-6).	UR 1 Vacant	R1 1 du/ac F2 SR	Yes, Criterion 2: Technical Correction	Replace potential residential use with commercial use.
4-8	PRMD (Troendly)	070-020-001 (0.45) Guerneville	Change land use designation and zoning to RVSC and K F2.	UR 10 Zen Spa Resort	R2 10 du/ac F2	Yes, Criterion 2: Non-conforming Use.	None

Request No.	***Applicant (Owner)***	***APN (Acres) Location***	***Land Use Map Amendment Request***	***Existing Land Use Designation and Use(s)***	***Existing Zoning***	***Meets Screening Criteria?***	***Net Changes if Approved***
4-9	PRMD (Loundagin)	070-020-037 (0.78) Guerneville	Change land use designation and zoning to LC and LC F2.	UR 10 Noonan's Auto Garage	R2 10 du/ac F2	Yes, Criterion 2: Non-conforming Use.	None
4-10	PRMD (U.S. Postal Service)	070-030-079 (0.94) Guerneville	Change land use designation and zoning to PQP and PF SR F2.	RVSC Guerneville Post Office	K SR F2	Yes, Criterion 2: Non-conforming Use	None
4-11	PRMD (Wilson)	070-030-010 (0.51) Guerneville	Change land use designation and zoning to RVSC and K F2.	UR 10 Russian River Resort	R2 10 du/ac F2	Yes, Criterion 2: Non-conforming Use.	None
4-12	PRMD, (Roman Catholic Bishop of Santa Rosa, County of Sonoma, and Russian River Fire Protection District)	070-060-010 (0.31) 070-060-012 (0.26) 070-060-039 (0.21) 070-060-040 (0.48) 070-060-050 (0.36) Guerneville	Change land use designation and zoning to PQP and PF SR or PF SR F2.	UR 4 St. Elizabeth's Church, County land, Guerneville Fire Protection District, and Guerneville Regional Library	R1 4 du/ac SR R1 4 du/ac SR R1 4 du/ac SR R1 4 du/ac SR F2 R1 4 du/ac SR F2	Yes, Criterion 2: Non-conforming Use	None

Request No.	***Applicant (Owner)***	***APN (Acres) Location***	***Land Use Map Amendment Request***	***Existing Land Use Designation and Use(s)***	***Existing Zoning***	***Meets Screening Criteria?***	***Net Changes if Approved***
4-13	PRMD (Tabib)	094-127-003 (0.16) Monte Rio 094-127-004 (0.15) Monte Rio	Change land use designation and zoning to PQP and PF SR F2.	UR 1 St. Andrews Episcopal Mission in the Redwoods	R1 1 du/ac SR F2	Yes, Criterion 2: Non-conforming Use	None
4-14	PRMD (Kokalis)	094-129-003 (0.36) Monte Rio	Change land use designation and zoning to LC and LC SR F2.	UR 1 Weekend Gardener Nursery	R1 1 du/ac SR F2	Yes, Criterion 2: Non-conforming Use	None
4-15	PRMD (Angel One Management)	070-380-008 (1.06) Forestville	Change land use designation and zoning to LC and LC SR F2.	RR 1.5 Russian River Pub	AR 1.5 SR F2	Yes, Criterion 2: Non-conforming Use	None
4-16	Fulkerson	070-390-001 (0.77) 070-390-018 (0.95) 070-390-031 (3.77) 070-390-032 (0.31) Forestville	Change land use designation and zoning to RVSC and K BR F1 F2 or K F2.	RR 1.5 Hilton Park Family Campground	AR 1.5 BR F1 F2 AR 1.5 BR F1 F2 AR 1.5 BR F1 F2 AR 1.5 F2	Yes, Criterion 2: Non-conforming Use	None

Request No.	***Applicant (Owner)***	***APN (Acres) Location***	***Land Use Map Amendment Request***	***Existing Land Use Designation and Use(s)***	***Existing Zoning***	***Meets Screening Criteria?***	***Net Changes if Approved***
Santa Rosa and Environs Planning Area							
5-6	Sonoma County Agricultural Preservation and Open Space District (SCAPOSD)	051 010 054 (290.66) 051 010 036 (38.10) 030 110 013 (38.53) Hood Mountain Regional Park	Change land use designation and zoning on "Parcel B" (388.82 acres, portions of three parcels) to PQP and PF BR SD, PF BR SR, or PF SD in association with LLA02-0076 to expand Hood Mountain Regional Park.	RRD 100 RRD 100 RRD 100 Vacant	RRD 100 BR SD RRD 100 BR SR RRD 100 SD	Yes, Criterion 4: Public Facility	Expansion of park.
5-7	Symons	058-232-032 (0.63) 058-232-033 (0.91) Wikiup	Change zoning to RR B7.	UR 1 Residential, agriculture	R1 B7	Yes, Criterion 2: Non-conforming Use	None
5-8	Vieira	134-132-062 (4.41) Santa Rosa	Change land use designation and zoning to UR 10 and PC to comply with conditions of PLP00-0022 for residential subdivision and mixed use building of live/work units and retail.	GC Vacant	C2	Yes, Criterion 2: Technical Correction	None

Request No.	***Applicant (Owner)***	***APN (Acres) Location***	***Land Use Map Amendment Request***	***Existing Land Use Designation and Use(s)***	***Existing Zoning***	***Meets Screening Criteria?***	***Net Changes if Approved***
Sebastopol and Environs Planning Area							
6-4	Dutton	063-040-013 (1.31) Sebastopol	Change land use designation and zoning to LC and LC SR.	RR 3 Coffee stand	RR3 SR	Yes, Criterion 2: Non-conforming Use	None
Rohnert Park – Cotati and Environs Planning Area (No Land Use Amendments)							
Petaluma and Environs Planning Area							
8-2	Michaelson (Baxman)	113-173-047 (4.07) 113-173-058 (1.80) Petaluma	Change land use designation and zoning to DA 10, to recognize a historic, non-conforming livestock yard and allow for maintenance and repair of horse trailers.	RR 3 Livestock yard and residential	AR 3	Yes, Criterion 2: Non-conforming Use	Expansion to include maintenance and repair of horse trailers.
8-4	City of Petaluma (Martinelli)	017-170-002 (197.00) 068-010-026 (97.94) Petaluma	Change land use designation and zoning to PQP and PF to allow for development of Petaluma Water Recycling Project by City of Petaluma.	LEA 60 Agriculture LEA 60	LEA 60 LEA 60	Yes, Criterion 4: Public Facility	Replace agricultural use with wastewater treatment facility.

Request No.	***Applicant (Owner)***	***APN (Acres) Location***	***Land Use Map Amendment Request***	***Existing Land Use Designation and Use(s)***	***Existing Zoning***	***Meets Screening Criteria?***	***Net Changes if Approved***
8-5	Weinstock	021-021-010 (0.37) Petaluma	Change land use designation and zoning to GC and C3.	RR 1.5 Dave's Auto Repair	AR 1.5 SR	Yes, Criterion 2: Non-conforming Use	None
Sonoma Valley Planning Area							
9-5	Curotto	128-322-013 (4.48) Sonoma	Change land use designation and zoning to LC to allow for solid waste and recycling collection facility.	RR 2.5 Residential, vacant	RR 2.5	Yes, Criterion 4: Public Facility	Replace potential residential use with commercial solid waste and recycling collection facility.
9-7	Weiss	056-051-017 (63.16) Agua Caliente	Change land use designation and zoning to RRD 100 and RRD 100 SR to comply with conditions of Lot Line Adjustment LLA 01-0081.	RRD 40 Vacant	RRD 40 SR	Yes, Criterion 3: Consistency with Concurrent Policy Change	N/A Addressed under separate application; approved under Resolution #02-1028.
9-8	Hill, Perry	Town of Glen Ellen	Incorporate specific new policies into Sonoma Valley Planning Area policies of Land Use Element.	N/A	N/A	Yes, Criterion 1: Agricultural Tourism	None

Exhibit 4.1-3
General Plan Land Use Designations, Existing and Proposed [a]

General Plan Land Use Designation	Existing General Plan [b] (acres)	Draft GP 2020 (acres)	Net Change (acres)
Agricultural Land Uses			
Diverse Agriculture	68,845	68,809	-36
Land Extensive Agriculture	186,462	186,540	+78
Land Intensive Agriculture	74,255	73,957	-298
Agricultural Total	***329,562***	***329,306***	***-256***
Resources and Rural Development Land Uses			
Resources & Rural Development	492,658	492,305	-353
Resources & Rural Development Total	***492,658***	***492,305***	***-353***
Residential Land Uses			
Rural Residential	75,588	75,482	-106
Urban Residential	6,307	6,303	-4
Residential Total	***81,895***	***81,785***	***-110***
Commercial Land Uses			
Recreation / Visitor - Serving Commercial	2,530	2,532	+2
General Commercial	241	241	0
Limited Commercial	1,167	1,172	+5
Limited Commercial Traffic Sensitive	22	22	0
Commercial Total	***3,960***	***3,966***	***+6***
Industrial Land Uses			
General Industrial	663	663	0
Limited Industrial	2,049	2,063	+14
Industrial Total	***2,712***	**2,726**	***+14***
Other Land Uses			
Public / Quasi-Public	55,723	56,425	+702
Public / Quasi-Public Total	***55,723***	***56,425***	***+702***
Unincorporated Area Subtotal	***966,510***	***966,513*** [c]	***- - -***
City Total	***44,237***	***44,237***	***- - -***
TOTAL COUNTY	***1,010,747***	***1,010,750***	***- - -***

a These projections do not include acreages of roads within either the unincorporated portion of Sonoma County or its cities. Furthermore, parcels having split land use designations are accounted for by the total parcel size for each designation. For example, a 10 acre parcel that is designated 5 acres Rural Residential and 5 acres Diverse Agriculture would be represented as 10 acres Rural Residential and 10 acres of Diverse Agriculture. There are approximately 300 parcels that have such designation in the unincorporated portion of the county.

b Amended though September 22, 2004.

c Difference in total county acreage is due to rounding of figures.

Source: Sonoma County Permit and Resource Management Department, September, 2004.

Urban Service Boundaries

The *Draft GP 2020* continues the County's commitment to concentrate future growth in cities and urban areas with community sewer and water systems. The key to implementing this strategy is the designation of urban service boundaries (USBs) on the land use plan maps and the establishment of policies regarding extension of public sewer and water service outside these designated areas. Revisions to the USBs are recommended to reflect changes in service availability and decisions made by voters, cities and other agencies regarding growth patterns in Sonoma County.

The proposed changes to each of the USBs would be as follows:

Sonoma Coast / Gualala Basin Planning Area

Bodega Bay USA – No change to USB proposed.

Sea Ranch USA – No change to USB proposed.

Occidental USA – Expand the USB to match the sanitation district boundary, except limit the USB on the three larger parcels on the District perimeter to the portions of the parcels occupied by the uses served by the sewer system. This change would add 21 developed parcels to USA.

Cloverdale / NE County Planning Area

City of Cloverdale USA – No change to USB proposed.

Geyserville USA – Expand the USB to match the sanitation zone boundary. This change would add three developed parcels, one undeveloped parcel, and treatment plant to the USA.

Healdsburg and Environs Planning Area

City of Healdsburg USA – Revise the USB to match the City Urban Growth Boundary (UGB) and Sphere of Influence (SOI). This change would delete two parcels from USA.

Town of Windsor USA – Expand the USB to match the Town UGB. This change would add approximately 117 parcels in eight areas to USA.

Russian River Planning Area

Forestville USA – No change to USB proposed.

Russian River USA – Expand the USB to include all parcels in the sanitation district and AP 072-180-027. This change would add approximately 20 developed and approximately 13 undeveloped parcels to USA.

Monte Rio USA – No change to USB proposed.

Santa Rosa and Environs Planning Area

City of Santa Rosa USA – Change the USB to match the City UGB. This change would add approximately 40 developed and undeveloped parcels in the South Santa Rosa Area to the USA, but

would delete approximately 80 mostly-developed parcels west of South Wright Road and north of Rincon Valley.

Airport-Larkfield-Wikiup USA – Expand the USB to match the sanitation district boundary, except to exclude parcels in the designated Community Separator. This change would add Sonoma County Airport and 16 mostly-developed parcels to the USA and would delete one parcel in the Community Separator.

Sebastopol and Environs Planning Area

City of Sebastopol USA – Reduce the USB to match the City UGB and SOI. This change would delete approximately 270 mostly-developed parcels in seven areas from USA.

Graton USA – Expand the USB to include areas which are in the sanitation district in areas contiguous to the current USB. This change would add approximately 33 mostly-developed parcels in three areas.

Rohnert Park – Cotati and Environs Planning Area

City of Rohnert Park USA – Expand the USB to match the UGB, except to delete 170 acres removed from the SOI by LAFCO pursuant to lawsuit settlement and City request. This change would add 195 mostly undeveloped acres northwest of City, 80 undeveloped acres south of Canon Manor subdivision, and Sonoma State University to the USA.

City of Cotati USA – No change to USB proposed.

Penngrove USA – Change the USB to match the sanitation district boundary. This change would add four developed parcels to the USA and would delete two developed parcels.

Petaluma and Environs Planning Area

City of Petaluma USA – Expand the USB to match the UGB. This change would add two mostly-developed parcels to the USA and would delete three mostly-developed parcels.

Sonoma Valley Planning Area

City of Sonoma / Sonoma Valley USA – Reduce the USB for the City of Sonoma to match the City UGB, deleting approximately 100 mostly-developed parcels. This change would also expand the USB for the Sonoma Valley sanitation district to match the current district boundary, including the 8th Street East Assessment District, but exclude two mostly-undeveloped parcels near Glen Ellen, developed parcels with outside service agreements, and other developed parcels south of Sonoma which are not contiguous to the current USB. This change would add approximately 30 mostly-developed parcels to the USA.

AFFORDABLE HOUSING

Objective **HE-3.2** of the Housing Element is to provide sites for an additional 500 housing units affordable to very low- or low-income households on parcels in Urban Service Areas designated on

the land use maps. [19] The selected sites would not be identified on the land use maps, but would be zoned with an affordable housing combining district that would allow either an affordable housing project or the uses allowed by the underlying district.

Policy **HE-3o** of the Housing Element directs Sonoma County to develop an affordable housing combining district for application to parcels in unincorporated communities within Urban Service Areas. [20] The purposes of the district zone would be to allow built densities of 20 units or more per acre on urban sites zoned for commercial, industrial, or public uses. If insufficient sites exist in these zoning districts, sites in residential or other zoning districts may be designated. The policy includes criteria that are to be applied to affordable housing projects proposed within the district.

As a part of the actions necessary to implement the *GP 2020* it is proposed to amend the *Sonoma County Zoning Ordinance* to include an Affordable Housing (AH) Combining District. The purpose of the AH Combining District is to implement Policy **HE-3o** of the Housing Element, by identifying under-utilized commercial, industrial, or residential lands, within the county's Urban Service Areas, which could be developed for housing affordable to Low and Very Low income households to increase the supply of affordable housing to County Residents.

The proposed sites are as follows: [21]

Airport Business Park Area

- Site A1 – 5100 Airport Boulevard 3.75 acres APN 0590230-051, current zoning R3-B6-155 dwelling units maximum.

- Site A2 – 380 Aviation Boulevard, 2.04 acres APN 0590350-016, current zoning MP 2 acre average.

Forestville Urban Service Area

- Site A4 – 6310 Forestville Street, 3.76 acres, APN 084-020-043, current zoning M1-SD.

Geyserville Urban Service Area

- Site A5 – 21225 Geyservile Avenue, 1.42 acres, APN 140-140-056, current zoning PC-HD-16 dwelling units / acre maximum.

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19 Very low-income households are households earning not more than 50 percent of the Sonoma County area median income. Low-income households are households earning between 51 and 80 percent of the Sonoma County are median income.

20 As used in the *Sonoma County Zoning Ordinance* a combining district is a zoning designation which is superimposed over a base zoning district to modify the regulations in the base zoning district.

21 PRMD staff prepared a list of potential sites for review by the CAC that would be appropriate for the AH Combining District. The list was prioritized into an "A" and "B" list. Memos to GP 2002 Citizen's Advisory Committee from Denise Peter, Planner III regarding Affordable Housing Combining District, July 18, 2002, October 17, 2002, and December 4, 2003.

Graton Urban Service Area

- Site A6 – 2999 Bowen Avenue, 0.64 acre, APN 130-152-008, current zoning M1.

Larkfield / Wikiup Urban Service Area

- Site A7 – 175, 245 Airport Boulevard, 5.20 acres, APN 039-025-028, 026, 060, current zoning CO.

Sonoma Valley Urban Service Area

- Site A9 – 17302 Vailetti Drive, 5.02 acres, APN 056-201-091, current zoning R2-B6-8 dwelling units / acre-F2-BR.

- Site A10 – 18503 Highway 12, 1.04 acres, APN 056-511-046, current zoning LC-TS-SR-SD.

Eighth Street East Sewer Assessment District Area

- Site A11 – 21988 8th Street East, 2.00 acres of a 53 acre site, APN 128-381-037, current zoning MP.

Penngrove Urban Service Area

- Site B6 – 220 Hatchery Road, 5.0 acres, APN 047-153-004, current zoning RR-B6-2 dwelling units / acres.

The total acreage of the ten sites is 29.87 acres. At a density of 20 units per acre these 10 sites could produce 597 housing units.

Land Use, Population, and Housing – Regulatory Setting

COUNTY AND REGIONAL

Sonoma County General Plan

The existing *General Plan* establishes goals, objectives, and policies that guide and direct the location and extent of future land uses, population growth, and housing as well as the services and infrastructure required to accommodate them. The existing General Plan includes Land Use Maps for the nine Planning Areas depicting the location of various land uses and the future boundaries of sewer and water services. The existing General Plan includes a Housing Element, adopted by the County and certified by the State Department of Housing and Community Development in 2002, that includes a wide range of housing policies and programs that will contribute to opportunities for all income levels and people with special needs

Sonoma County Local Coastal Program

The *Local Coastal Program* (LCP) for Sonoma County was adopted by the County in 1981. A revision to the LCP was certified by the California Coastal Commission in December, 2001; this

revision was limited to changes necessary to make the LCP consistent with the existing General Plan. In particular, the coastal zone now uses a modified version of the countywide zoning ordinance that provides additional protection to lands within the coastal zone. Land use designations and zoning categories are now similar to those used countywide. The LCP is currently being updated to include new background information as well as policies and implementation measures in coordination with the *GP 2020* update. [22]

County Zoning Code

The *Zoning Code* implements the policies of the General Plan; it is the primary land use tool used by the Project Review Division, Board of Zoning Adjustments, Planning Commission, and Board of Supervisors in reviewing and regulating new development. The code contains criteria for making findings of approval, allowing certain uses, and placing, locating, and controlling the form of new structures. [23]

County Redevelopment Agency

Redevelopment agencies operate under the provisions of the State Community Redevelopment Law (CRL). The CRL allows a designated project area to receive focused public attention and financial investment to reverse deterioration trends, specifically through the allocation of the tax increment dollars in the project area. The public funds can be used to rehabilitate housing stock, revitalize business environments, and create jobs. The Roseland and Sonoma Valley project areas were designated in 1984. The Windsor project area, also established in 1984, was assumed by the Town of Windsor upon its incorporation. The Russian River Redevelopment Area was approved in 2000. [24] Each Redevelopment Area is subject to a Redevelopment Plan that relies upon the General Plan Land Use Map for future land use and development decisions.

Other County Plans and Programs

Other entities in the county that exert influence over land use, either regulatory or non-regulatory, include the Sonoma County Agricultural Preservation and Open Space District, the Sonoma County Water Agency, the Sonoma County Waste Management Authority, and the Sonoma County Airport Land Use Commission.

Local Agency Formation Commission (LAFCo)

LAFCo is an independent agency, established by State law and comprised of representatives of the county, cities, special districts, and the public. Each incorporated city and many other public agencies that provide sewage collection or supply water have a district boundary indicating the service area. LAFCo has responsibility for reviewing, approving, or disapproving changes in boundaries of all jurisdictions within county boundaries, including annexations, detachments, new formations, and

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22 Nichols • Berman communication with Kathy Jacobs, Sonoma County PRMD, March, 2003.

23 *Taylor Mountain/Sonoma Mountain Development Guidelines and Proposed Sonoma Valley Mayacamas Mountains Guidelines*, CAC memo, Denise Peter, Sonoma County PRMD, August 15, 2002.

24 *Redevelopment,* County of Sonoma Community Development Commission website, http://www.sonoma-county.org/cdc/redevagency.htm.

incorporations. New State legislation requires that LAFCos perform Municipal Service Reviews as part of this process.

LAFCos have intended to discourage urban sprawl, preserve open space and agricultural land, and provide government services efficiently. LAFCo must adopt for each local agency a *sphere of influence* that describes the area within which properties are eligible to annex to the city or district. The Sonoma County LAFCo has adopted policies that support urban growth boundaries and their coordination with spheres of influence; disapprove annexation within Community Separators; and discourage conversion of designated agricultural and open space land to urban uses. [25]

City General Plans

Incorporated cities have a broad range of powers, responsibilities, and political independence. Within their limits, cities control development permits and utility services. The County relies on interagency communication, review procedures, voluntary coordination, and LAFCo actions to influence the future boundaries of cities.

Each city within the County has adopted a general plan that guides where development and services are planned. Most of these general plans have policies regarding future annexation, urban development, and extension of urban services in areas not within current city limits. In addition, voters in very city with the exception of Cloverdale have approved urban growth boundaries that cannot be changed without another vote by city residents. Each city has adopted a General Plan since 1992, or is in the process of doing so.

A major issue addressed by policies in both city and the county general plans is whether to allow extension of urban sewer and water services beyond city limits, district boundaries, sphere of influence, urban growth boundaries, and / or Urban Service Boundaries (USBs). The existing County *General Plan* policy allows extension outside of USBs only where necessary to resolve a public health hazard resulting from existing development. [26]

Association of Bay Area Governments (ABAG) Smart Growth Strategy

Five of the Bay Area's regional agencies, organized by ABAG, developed the *Smart Growth Strategy-Regional Livability Footprint Project.* The project aims to change the underlying fiscal and regulatory structure of current growth patterns to support more sustainable land use patterns. The future ideal vision developed by the project for Sonoma County featured a rail line extending along the currently unused Northwestern Pacific railroad right-of-way from Cloverdale south into Marin County. New stations in most cities and new mixed-use communities would be built. Densities in existing urban areas would be increased. A smart growth scenario was modeled to illustrate the potential positive effects of these land use policy changes. [27]

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25 *Urban Boundaries*, CAC memo, Robert Gaiser, Sonoma County PRMD, November 6, 2003.

26 *Urban Boundaries*, CAC memo, Robert Gaiser, Sonoma County PRMD, November 6, 2003.

27 *Regional Livability Footprint Project,* ABAG, Metropolitan Transportation Commission, Bay Area Air Quality Management District, Bay Conservation and Development Commission, and Regional Water Quality Control Board, October, 2002.

STATE AND FEDERAL

State Department of Parks and Recreation

The State Department of Parks and Recreation owns and manages a number of parks, historic parks, reserves, and a recreation area within Sonoma County, totaling more than 17,000 acres. It has regulatory authority over these lands. They include Annadel State Park, Armstrong Redwoods State Reserve, Austin Creek State Recreation Area, Fort Ross State Historic Park, Jack London State Historic Park, Kruse Rhododendron State Reserve, Petaluma Adobe State Historic Park, Salt Point State Park, Sonoma State Historic Park, Sonoma Coast State Beach, and Sugarloaf Ridge State Park. [28]

State Department of Fish and Game

The State Department of Fish and Game owns and manages several wildlife areas within Sonoma County. It has regulatory authority over these lands. These include 8,000 acres surrounding Lake Sonoma and the Warm Springs salmon and steelhead fish hatchery; the dam and reservoir are under the jurisdiction of the U.S. Army Corps of Engineers. The Laguna Wildlife Area contains 539 acres of freshwater wetland. The Petaluma Marsh, located partially in Marin County, contains 3,748 acres of salt and brackish marshes. The Napa-Sonoma Marshes (also partially located in Solano County) are comprised of 11,892 acres of bay front wetlands.

Land Use, Population, and Housing – Significance Criteria

The land use, population, and housing analysis use criteria from the *State CEQA Guidelines.* According to these criteria, the project would have a significant land use, population, or housing impact if it would:

- Induce substantial population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure);

- Introduce new land uses, or alter the intensity of existing land uses, which would be incompatible with the established land uses within Sonoma County's unincorporated area;

- Physically divide an established community. ***No significant impact, see Appendix 7.4 Initial Study***;

- Conflict with any applicable habitat conservation plan or natural community conservation plan. ***No significant impact, see Section 4.6 Biological Resources;*** or

- Displace substantial numbers of existing housing, necessitating the construction of replacement housing elsewhere; or, displace substantial numbers of people, necessitating the construction of replacement housing elsewhere. ***No significant impact, see Appendix 7.4 Initial Study.***

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[28] California State Parks website, http://www.parks.ca.gov.

Land Use, Population, and Housing – Impacts and Mitigation Measures

SUMMARY OF LAND USES AND DEVELOPMENT CONSISTENT WITH THE DRAFT GP 2020

This EIR analyzes the environmental impacts of a wide range of land use activities and development that would occur through the implementation of the *Draft GP 2020.* The phrase *land uses and development consistent with the Draft GP 2020* is used throughout this EIR to describe both what may be considered traditional development (i.e., residential, commercial, and industrial development) as well as development related to other permitted land uses (e.g., agricultural cultivation, public services, public infrastructure projects, and resources extraction) that would occur. When appropriate, specific development projects, types of development, and / or land uses and activities that would result in adverse environmental impacts are discussed in greater detail in various sections of this EIR. The following provides a general summary of land uses and development that are projected to occur as a result of implementation of the *Draft GP 2020.*

Residential, Agricultural, Commercial, and Industrial Development

Exhibit 4.1-4 describes the amount of projected residential, agricultural, and commercial and industrial development and is consistent with the data presented in Table LU-5 of the *Draft GP 2020*. However, **Exhibit 4.1-4** includes in its residential total, units within the unincorporated portions of the USAs of Sonoma County's nine cities. Inclusion of these units in **Exhibit 4.1-4** results in a higher total of existing residential units than does Table LU-5. Because all of these units are assumed to be annexed by the cities through 2020, **Exhibit 4.1-4** shows an overall decline in the number of residential units in the unincorporated area by 2020. It is important to note that data for both the number of existing residential units and projected increases to residential units in the unincorporated area outside of the USAs of the nine cities are consistent between Table LU-5 of the *Draft GP 2020* and **Exhibit 4.1-4.** It should also be noted that agricultural processing facilities, such as wineries, are included in the square footage of agricultural, commercial, and industrial development projected through 2020.

Exhibit 4.1-4
Summary of Development Consistent with the Draft GP 2020

Planning Area	Residential (Units)			Agricultural / Commercial / Industrial (Square Feet)		
	2000[a]	2020	Net Change	2000	2020	Net Change
Sonoma Coast / Gualala Basin	6,131	7,508	+1,377	325,898	871,888	+545,990
Cloverdale / N.E. County	2,385	2,821	+436	1,575,407	7,676,097	+6,100,690
Healdsburg	3,017	3,041	+24	989,606	4,756,947	+3,767,341
Russian River	9,345	10,343	+998	826,809	1,958,819	+1,132,010
Santa Rosa	15,622	11,306	-4,316	5,504,607	10,098,554	+4,593,947
Sebastopol	8,594	8,278	-316	562,377	1,902,357	+1,339,980
Rohnert Park- Cotati	2,256	2,018	-238	240,293	772,201	+531,908
Petaluma	4,202	4,086	-116	85,119	876,346	+791,227
Sonoma Valley	12,849	14,388	+1,539	2,496,657	7,128,651	+4,631,994
Total	***64,401***	***63,789***	***-612***	***12,606,773***	***36,041,860***	***+23,435,087***

a Year 2000 data based upon Year 2000 City Limits

Sources: Nichols • Berman and PRMD – Final Development Data for Planning Areas by Traffic Assignment Zones.

Development and Activities Related to Other Land Uses

In addition to residential, commercial, and industrial development, the *Draft GP 2020* would permit development related to a wide range of land uses and activities in the unincorporated area. Such uses would primarily include public services and facilities, agricultural cultivation, and resource use and extraction. As previously noted, adverse environmental impacts that may result from development and operation of these activities are discussed, as appropriate throughout various sections of this EIR.

The development and operation of public services and facilities is primarily discussed in ***Section 4.9 Public Services***. Examples of public use projects that could be developed consistent with the *Draft GP 2020* include parks, water supply and wastewater treatment facilities, landfills, wastewater irrigation, road and transit systems, and other infrastructure improvements. In general, these types of land uses could result in a number of adverse environmental impacts. For example, the use of parks could generate additional traffic and some possible land use conflicts in adjacent agricultural areas. Landfills could generate water quality, noise, traffic, and odor issues. Water supply and wastewater

treatment facilities could affect water quality, water availability, and biotic resources. Road and transit uses could affect water quality, noise, and air quality.

The development and operation of agricultural uses are primarily discussed in ***Section 4.8 Agricultural and Timber Resources***. Examples of such land uses and development that could occur through implementation of the *Draft GP 2020* include vineyards, row crops, orchards, grazing and the raising of animals (e.g., dairies, livestock, and horses), processing (e.g., wineries), support (e.g. sales of farm supplies), and visitor-serving uses (e.g., tasting rooms and homestays). Potential adverse environmental impacts related to agricultural activities include: erosion, sedimentation and alteration of drainage patterns; water use; loss of biotic habitat; noise; hazardous materials use; disturbance of cultural resources; and circulation (e.g., generation of truck traffic).

The development and operation of resource use and extraction activities that would occur are primarily discussed in ***Sections 4.7 Geology / Soils***, ***4.8 Agricultural and Timber Resources,*** and ***4.12 Energy***. Examples of such land uses include timber and mining operations as well as energy producing activities such as steam generation. In general, these uses have impacts similar to agricultural uses.

Impact 4.1-1 Growth and Concentration of Population

*Implementation of the Draft GP 2020 would induce growth of population within the unincorporated portion of Sonoma County by accommodating new housing and businesses and by providing services and infrastructure capacity. However, this would be a less-than-significant impact. **(LTS)***

As of Census 2000 the unincorporated portion of Sonoma County, outside of the incorporated city USAs, had a population of 128,596. [29] The *Draft GP 2020* projects a population of 147,660 in the unincorporated area by 2020. This would be a 15 percent increase between 2000 and 2020 for a total of 19,064 additional residents.

Sonoma County (incorporated plus unincorporated areas) had a Census 2000 population of 458,614. The population within the unincorporated area, outside of the incorporated city USAs, therefore represents 28 percent of the total County population. Sonoma County estimates that in 2020 it would have a total population of 546,030, a 19 percent increase above the 2000 level. [30] The portion of the population residing within the unincorporated area in 2020 would be consistent with its 2000 level, representing 27 percent of the total population of Sonoma County.

The Census 2000 population for the nine Bay Area counties was 6,783,762. According to the Association of Bay Area Governments (ABAG) *Projections 2002*, the Bay Area is expected to have a population of 8,014,000 in the year 2020, an 18 percent increase above its 2000 level. [31] In 2000 the unincorporated portion of Sonoma County represented approximately 1.9 percent of the Bay Area population. With implementation of the *Draft GP 2020,* population in the unincorporated portion of Sonoma County would represent 1.8 percent of the projected Bay Area population by 2020.

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29 *Table LU-2, Sonoma County General Plan 2020 Public Hearing Draft,* Sonoma County PRMD, *October 28, 2004.*

30 *Table LU-2, Sonoma County General Plan 2020 Public Hearing Draft,* Sonoma County PRMD, *October 28, 2004.*

31 *Projections 2002,* Association of Bay Area Governments, 2002.

Therefore, population growth within the unincorporated portion of Sonoma County would be consistent with ABAG's regional projections.

ABAG's *Projections 2002* projects a 2020 population for the unincorporated portion of Sonoma County of 151,200. Thus, the ABAG projected population for the unincorporated portion of Sonoma County is 4,450 persons more than the population projections of the *Draft GP 2020.* However, as shown above, the *Draft GP 2020* population projections are otherwise consistent with ABAG's regional projections. [32]

Population growth consistent with that projected for the *Draft GP 2020* would result in secondary impacts related to public services and utilities. These impacts are described in ***Section 4.9 Public Services*** of this EIR.

The *Draft GP 2020* also proposes amendments to existing land use designations as described in the environmental setting section that were considered for approval by the Citizens Advisory Committee (CAC). Land Use Amendments recommended for approval by the CAC are included as a part of the *Draft GP 2020* summarized in **Exhibit 4.1-2**. Land Use Amendments that were recommended for denial are considered as part of ***Chapter 5.0 Alternatives***.

The majority of the proposed amendments would be to achieve technical corrections, to recognize and correct an existing non-conforming land uses, to accommodate previously approved public facilities (e.g., a public park), or to achieve consistency with a General Plan policy change proposed by the *Draft GP 2020.* If adopted, none of the proposed amendments would change an existing land use designation that does not permit residential development to a designation that would allow residential development for any undeveloped parcels. Land Use Amendments 2-16 and 4-7 would allow the development of commercial uses on parcels of 5.11 and 0.3 acres in size, respectively. Land Use Amendment 3-4 would allow the development of a winery on approximately 87 acres of land designated Land Extensive Agriculture (LEA). Impacts to agricultural resources resulting from proposed Land Use Amendments are considered in ***Section 4.8 Agricultural and Timber Resources***.

Therefore, substantial growth of population would not occur within the unincorporated portion of Sonoma County as a result of proposed Land use Amendments contained in the *Draft GP 2020*.

As described in the environmental setting, the *Draft GP 2020* also continues the County's commitment to concentrate future growth in cities and urban service areas with community sewer and water systems through, among other means, the designation of urban service boundaries (USBs). Proposed changes to existing USBs could result in the development of residential and other uses if they allowed the extension of water or sanitation services to *undeveloped* parcels outside of current service districts. However, the majority of proposed changes to the unincorporated USBs contained in the *Draft GP 2020* would be to include *developed* parcels already within existing sanitation districts. Therefore, proposed changes to the USBs would not induce substantial growth due to the availability of sewer service.

Proposed changes to the USBs of Sonoma County's nine cities would mostly reflect boundaries that have already been adopted by LAFCo and the county's nine cities. As the *Draft GP 2020* assumes the

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[32] *Draft GP 2020* uses Projections 2002 as a starting point for population, housing and employment projections. However since the time *Draft GP 2020* was prepared, ABAG has published Projections 2003 which estimates a lower population for the unincorporated portion of Sonoma County due to its use of a Smart Growth scenario for the region.

annexation of lands within the City UGB or SOI, such changes would not induce substantial growth of population within the unincorporated portion of Sonoma County.

Within the Sonoma Coast / Gualala Basin Planning Area, proposed expansion of the Occidental USB to match the sanitation district boundary would not result in substantial growth of population due to the availability of sewer service as the 21 parcels that would be included are already developed. Expansion of the USB would also avoid the inclusion of the undeveloped portions of three large parcels. No changes to the USBs of either the Bodega Bay or Sea Ranch USAs are proposed. Therefore, substantial growth of population would not occur as a result of changes to USBs within the Planning Area.

Within the Cloverdale / N.E. County Planning Area, the proposed expansion of the Geyserville USB to match the sanitation zone boundary would add one undeveloped parcel to the USA. Inclusion of this undeveloped parcel (approximately five acres in size) designated Limited Commercial would result in an increase in commercial use due to the availability of sewer service. [33] No changes are proposed to the Cloverdale USB. Therefore, substantial growth of population would not occur as a result of changes to USBs within the Planning Area.

Within the Healdsburg and Environs Planning Area there are no unincorporated USAs. Proposed revisions to the USBs to match either the City Urban Growth Boundary (UGB) and / or the Sphere of Influence (SOI) for the City of Healdsburg and the Town of Windsor would not result in substantial growth of population within the unincorporated portion of Sonoma County as the *Draft GP 2020* assumes the annexation of lands within the City UGB or SOI.

Within the Russian River Planning Area, the proposed expansion of the Russian River USB would add 13 undeveloped parcels to the USA. However, of these 13 undeveloped parcels, only five small parcels within and one small parcel adjacent to the sanitation district could be developed for residential use. No changes are proposed to the USBs of either the Forestville or Monte Rio USAs. Therefore, substantial growth of population would not occur as a result of changes to USBs within the Planning Area.

Within the Santa Rosa and Environs Planning Area, substantial growth of population would not occur as a result of changes to USBs within the Planning Area. The proposed expansion of the Airport-Larkfield-Wikiup USB to match the sanitation district boundary would not result in substantial development of residential or other uses due to the availability of sewer service as most of the 16 parcels that would be included are already developed.

In the Sebastopol and Environs Planning Area, proposed changes to the Graton USB would not result in substantial growth of population due to the availability of sewer service as most of the 33 parcels within the existing sanitation district that would be included are already developed. The proposed deletion of 270 parcels from the Sebastopol USB would not result in substantial growth of population within the unincorporated area subsequent to their deletion, as most of these parcels are already developed. Therefore, substantial growth of population would not occur as a result of changes to USBs within the Planning Area.

Within the Rohnert Park - Cotati and Environs Planning Area, proposed changes to the Penngrove USB would not result in substantial growth of population due to the availability of sewer service as the

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[33] Inclusion of this undeveloped parcel is proposed as part of Land Use Amendment Request 2-16.

four parcels within the existing sanitation district that would be included are already developed. No changes to the USB are proposed within the Cotati USA. The proposed changes to the Rohnert Park USB to match the city's UGB would add 195 mostly undeveloped acres northwest of City, and 80 mostly undeveloped acres south of the Canon Manor subdivision, and Sonoma State University to the unincorporated area at the request of the City.

Within the Petaluma and Environs Planning Area, the *Draft GP 2020* would expand the Petaluma USB to match the UGB. As the three parcels that would be added to unincorporated area by deletion from the Petaluma USA are mostly developed, substantial growth of population would not occur within the Planning Area as a result of proposed changes to the USB.

Within the Sonoma Valley Planning Area, the *Draft GP 2020* proposes the expansion of the Sonoma Valley USB to match the sanitation district boundary, including the 8th Street East Assessment District. Substantial growth of population would not occur in this area as a result of the availability of sewer service as the approximately 30 parcels that would be added to the USA are already developed and also because two undeveloped parcels within the sanitation district near Glen Ellen would be excluded. The proposed reduction of the Sonoma USB to match the city UGB, would not result in substantial growth of population in the unincorporated area as the 100 parcels that would be added to the unincorporated area are mostly-developed. Therefore, substantial growth of population would not occur as a result of changes to USBs within the Planning Area.

In spite of the limited changes to the land use designations and urban service boundaries noted above, land use designations of the *Draft GP 2020* would accommodate the projected population growth described earlier in this section. In this sense, the *Draft GP 2020* is growth inducing. The Draft GP 2020 also provides for the expansion of public services and infrastructure necessary to serve this projected growth. However, the *Draft GP 2020* includes goals, objectives, and policies that assure that the land use maps, public services, and infrastructure do not induce substantial additional growth beyond what is projected.

As shown in **Exhibit 4.1-3,** there would not be a substantial change in the land use plan between the existing *General Plan* and the *Draft GP 2020.* Furthermore, the goals and policies would direct future growth towards USAs with established growth boundaries to ensure that biotic, agricultural, open space and other resources are protected consistent with the ten goals of the *Draft GP 2020.* Therefore, implementation of the *Draft GP 2020* would reduce the potential for substantial growth of population within the unincorporated portion of Sonoma County.

Specifically, Goals **LU-2** and **LU-3** of the Land Use Element would accommodate the major share of future growth in a compact manner within the nine existing cities and their expansion areas and within selected unincorporated communities which are planned to have adequate water and sewer capacities. These goals would be implemented by the following policies.

Policies **LU-2a** and **LU-2b** would ensure growth consistent with the *GP 2020* and balance residential holding capacity with projected growth and consider denial of land use amendments which add residential density in *rural areas* if the residential capacity exceeds projected growth. Policies **LU-3a**, **LU-3b**, **LU-3c** and **LU-3d** would ensure that growth would be contained within the unincorporated and incorporated USAs by: requiring consistency between *GP 2020* and amendments to LAFCo SOIs or USAs; by denying land use amendments that increased residential density beyond projected growth; by limiting, with exceptions, the extension of water or sewer services outside of designated USAs: and by maintaining low development densities outside of the USAs.

Policies **PF-1a**, **PF-1b**, **PF-1e**, and **PF-1f** would implement Goal **PF-1** of the Public Facilities Element to assure that water and wastewater services are available when necessary to serve planned growth and development without unduly promoting sprawl or unplanned growth. Specifically Policy **PF-1f** would, with certain exceptions, avoid the extension of public sewer services outside of either a LAFCo SOI or the USA.

Similarly, policies of Agricultural Resources Element would promote an urban centered development strategy, stabilize the urban fringe, and thereby limit the conversion of agricultural land outside the USAs to urban uses. Policy **AR-2a** would limit residential and commercial or industrial growth in agricultural areas by prohibiting the extension of necessary urban services into these areas. Additionally, Policies **AR-2b** and **AR-2d** would limit urban growth on these lands by requiring consistency between the *GP 2020* and proposed LAFCo changes to either a SOI or USA and through the use of purchase or transfer of development rights to prevent the intrusion of residential lands.

In conclusion, the *Draft GP 2020* projects future population growth and economic development as well as needed housing and jobs in accordance with compact urban boundaries, protection of agriculture, and the other major goals enumerated in the land use policy framework. The *Draft GP 2020* also provides for the expansion of public services and infrastructure needed to serve this growth. However, since the *Draft GP 2020* includes substantial limitations on the amount of rural growth that would be allowed as well as policies which minimize the extension of urban services into rural and agricultural areas, it would accommodate planned growth but would not induce substantial growth within the unincorporated beyond what is currently planned. Therefore, this would be a less-than-significant impact.

Mitigation Measures 4.1-1 None required.

Impact 4.1-2 Land Use Conflicts between Agricultural and Residential / Urban Uses

Implementation of the Draft GP 2020 would result in the intrusion of residential uses into agricultural areas thereby exposing residents to noise, odors, dust, and similar nuisances associated with agricultural operations. Such residential development may be incompatible with agricultural operations. Urban uses at the fringe of cities and the unincorporated communities may also encounter these agricultural operations. Both residential intrusion and urban uses at the fringe may result in land use conflicts and land use incompatibility. While the Draft GP 2020 and the Sonoma County Code contain policies and ordinances to reduce this impact, this would be a significant impact. ***(S)***

Land use conflicts between urban and agricultural uses result when residential and other uses become the primary use of lands adjacent to or surrounded by agricultural uses. Urban intrusion into agricultural lands could occur as a result of implementation of the *Draft GP 2020* Land Use Plan as well as from the proposed expansion of the unincorporated urban service areas. As discussed in *Impact 4.8-1 Conversion of Agricultural Lands to Non-Agricultural Uses,* proposed land use amendments contained in the *Draft GP 2020* would not convert agricultural land to residential uses in such areas. [34]

As discussed in the environmental setting, the increasing value of property in rural areas can result in land use conflicts in agricultural areas. Maintaining parcels in large minimum sizes no longer protects

[34] Land use amendment requests that proposed changing agricultural land use designations to residential ones were not recommended by the CAC as part of *Draft GP 2020*. Such requests are considered in ***Chapter 5.0 Alternatives.***

agricultural resources as effectively as in the past as such parcels have become attractive places to live for an increasing number of people that can afford them. In addition, parcelization has occurred both on the urban fringe and in the midst of agricultural areas which has resulted in residential use being the primary use of the land.[35] In some areas, County zoning also permits small residential lots to be clustered together, surrounded by large agricultural areas. This type of development withdraws some land from production, exposes a large perimeter area to conflicts, and can threaten the interior areas.[36]

Competition also occurs between urban and agricultural uses along the boundaries of the USAs.[37] Rapid urban growth produces pressures on agricultural lands that tend to discourage new agricultural investment and uses, raises the price of land making purchase for farming unrealistic, and increases the likelihood of conversion to a non-agricultural use.[38] Conversion of agricultural land to non-agricultural uses is further discussed in ***Section 4.8 Agricultural and Timber Resources.***

Complaints from residents about noise, odors, flies, spraying, etc attendant to adjacent agricultural practices have discouraged and sometimes prevented farmers from managing their operations in an efficient and economic manner.[39] Not only do residents complain about aspects of farming operations, but residential areas often directly affect the operations. For example, residential sites can become a sanctuary for pests which could damage adjacent crops.[40]

Goal **LU-9** and its implementing policies provide for the protection of lands suitable for or currently in agricultural production as a guiding principle of the *Draft GP 2020*. Accordingly, the Land Use, Agricultural Resources, and Public Facilities and Services Elements establish policies that would limit land use conflicts between residential and agricultural uses by reducing the intrusion of residential uses into agricultural areas, stabilizing the urban fringe, and supporting the needs and practices of agriculture as the highest priority in areas designated for agricultural use. In addition, land use conflicts would be mitigated by the continued application of the Right to Farm Ordinance contained in the Sonoma County Code.

Right to Farm (RTF) ordinances are intended to reduce land use conflicts between agricultural and residential neighbors. Such ordinances are not regulatory mechanisms but rather informational tools whereby new residents, especially those from urban areas unfamiliar with rural living, are educated

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35 *Agricultural Resources Element, Sonoma County General Plan 2020 Public Hearing Draft*, Sonoma County PRMD, October 2004.

36 *Agricultural Resources Element, Sonoma County General Plan 2020 Public Hearing Draft*, Sonoma County PRMD, October 2004.

37 *Agricultural Resources Element, Sonoma County General Plan 2020 Public Hearing Draft*, Sonoma County PRMD, October 2004.

38 *Agricultural Resources Element, Sonoma County General Plan 2020 Public Hearing Draft*, Sonoma County PRMD, October 2004.

39 *Agricultural Resources Element, Sonoma County General Plan 2020 Public Hearing Draft*, Sonoma County PRMD, October 2004

40 *Agricultural Resources Element, Sonoma County General Plan 2020 Public Hearing Draft*, Sonoma County PRMD, October 2004

about the realities of modern farming. A RTF ordinance reduces the opposition of urban neighbors to agricultural operations as a nuisance generator and in doing so, makes residents less inclined to complain or file lawsuits over common nuisances such as sprays, dusts, odors, and noise. As a result, the normal activities of farmers and ranchers are thereby protected.

The Sonoma County Right to Farm Ordinance, contained in the Sonoma County Code, would support the policies of the *Draft GP 2020* in reducing agricultural and residential land use conflicts. Since 1999, this ordinance requires the disclosure of potential nuisances from agricultural operations to affected parties in annual tax bills, at issuance of building permits, and at close of escrow for existing home sales. In addition, it requires the developer builder / purchaser sign and file the disclosure notice with the County Recorder's Office. Such a filing assures the disclosure is attached to the property deed and transmitted to future buyers during the title search process.

The ordinance provides that a legal and properly conducted agricultural operation will not be considered a nuisance under the Sonoma County Code. The ordinance further reduces the potential for land use conflicts through asserting (both to county government and its residents) the importance of preserving agriculture as a policy matter, by providing a factual basis from which county government can respond to complaints, and by providing a framework for discussion between farmers and residential neighbors. All of these effects would, in general, be expected to prevent minor complaints from becoming lawsuits and promote a more peaceful coexistence between agricultural and residential neighbors.

The Sonoma County RTF ordinance informs those directly affected and the community at large about the importance of maintaining a productive agricultural sector in the face of urban growth.[41] Furthermore, it provides information about the consequences of residing near agricultural operations that generate noise, dust, odor, traffic and other negative effects. Buyers can then weigh these consequences against other factors such as the price of the home or the importance of rural aesthetics.

However, a RTF ordinance is a limited answer to the problem of conflict and incompatible land uses at the urban edge. It does not prevent lawsuits even if the practice in question is normally accepted. A comprehensive solution depends upon more active measures. These include the planning and design of urban development sensitive to agricultural operations as well as appropriate modifications in farm practices at the urban edge. The *Draft GP 2020* contains such measures implemented by the policies of the Agricultural Resources, Land Use, and Public Facilities and Services Elements

Goal **AR-4** of the Agricultural Resources Element would seek to allow farmers to manage their operations in an efficient economic manner through the implementation of policies designed to mitigate conflicts between agricultural and nonagricultural uses in designated agricultural production areas.

To implement Goal **AR-4**, Policies **AR-4a**, and **AR-4b** would continue to apply agricultural zoning districts to agricultural lands while formally recognizing that the primary use of any parcel within the three agricultural land use categories would be agricultural production and related processing, support services, and visitor serving uses. In addition, residential uses in these areas would recognize that the primary use of the land may create agricultural "nuisance" situations, such as flies, noise, odors, and spraying of chemicals. The continued implementation of Policy **AR-4d** would reduce the likelihood

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41 *County Right-to-Farm Ordinances in California: An Assessment of Impact and Effectiveness*, Matthew Wacker et al., University of California Agricultural Issues Center, May 2001.

of nuisance complaints through the application of the provisions of the Right to Farm Ordinance (see earlier discussion) to all lands designated within agricultural land use categories. Additionally, Policy **AR-4e** would continue to enforce provisions of existing state nuisance law (California Civil Code Section 3482.5).

Policy **AR-4c** would continue to reduce the land use conflicts and protect agricultural operations by establishing an agricultural setback that would maintain a physical separation of 100 to 200 feet between the agricultural land use and a residential use adjacent to an agricultural land use category.

If developed, Policy **AR-4f** could reduce land use conflicts by preventing residential intrusion into agricultural areas through the preparation of specific measures (to be considered by the Board of Supervisors) that would carry out voluntary purchase or transfer of development rights from agricultural areas to designated nonagricultural areas.

Policy **AR-4g** would continue to reduce land use conflicts between existing agricultural operations and proposed new ones by requiring that any anticipated conflicts be mitigated by the newer use or application. This would reduce land use conflicts between agricultural uses or between existing agricultural uses and proposed agricultural processing or visitor-serving uses.

Policies contained in the *Draft GP 2020* would reduce agricultural and urban land use conflicts by limiting the intrusion of residential uses into agricultural areas. This would be accomplished through the implementation of policies designed to promote compact urban development, limit the extension of urban services, maintain viable agricultural parcel sizes, and stabilize the urban fringe.

Policies **PF-1d** and **PF-1e** would avoid wastewater extension of public sewer services outside of either a LAFCo adopted sphere of influence (SOI) or an urban service area (USA) thereby establishing a boundary beyond which only uses compatible with preserving agriculture and open space resources are allowed. Policies **LU-3a** through **LU-3d** would continue to locate future growth within the cities and unincorporated USAs in a compact manner. Policies **AR-3a** through **AR-3d** would continue to reduce intrusion of residential uses into agricultural areas by limiting the amount of subdivision of new parcels and requiring units to be clustered. For instance, subdivision of lands located within the Land Intensive Agriculture (LIA) category would be restricted to parcels of 20 acres in size or greater. Allowing the clustering of small parcels would have the benefit of leaving larger economically viable agricultural parcels. Furthermore, the policy limits the number of small lots to minimize the potential for land use conflicts. Finally, policies **AR-2a** through **AR-2e** would continue to help stabilize agricultural use at the urban fringe by using transfer or purchase of development rights to limit residential intrusion and through consultation with LAFCo and the agricultural community regarding SOI and USA boundary changes.

In conclusion, development and population growth in the unincorporated areas consistent with the *Draft GP 2020* may increase land use conflicts and incompatibility in the County. However, policies of the *Draft GP 2020* and the RTF ordinance would address incompatibility issues between agricultural and urban / residential uses and continue to minimize the frequency at which nuisance complaints become lawsuits. While these policies would reduce such conflicts, complaints about existing agricultural operations from existing and new residents would likely continue. Further, new conflicts over the expansion of agricultural operations would also be likely. Therefore, this would be a significant impact.

Mitigation Measure 4.1-2 No mitigation available beyond the *Draft GP 2020* policies discussed in the impact analysis above.

Significance After Mitigation This would be a significant unavoidable impact. (**SU**)

Impact 4.1-3 Incompatible Land Uses in the Rural Area

Land uses and development consistent with the Draft GP 2020 would result in changes in land use type, density, and scale within rural areas and generate land use incompatibilities. While policies and programs contained in the Draft GP 2020 would reduce such incompatibilities, this would be a significant impact. ***(S)***

Since the preparation of the existing *General Plan*, the County has seen an increase in the construction of relatively larger structures including agriculture-related uses such as processing facilities (e.g., wineries), tasting rooms, and other visitor-serving uses in the rural areas. [42] As described in **Exhibit 4.1-4,** implementation of the *Draft GP 2020* could result in land use incompatibilities resulting from the introduction of new land uses of greater scale and / or increased density that would generate noise, exceed local transportation infrastructure capacities, be incompatible with existing agricultural operations, or visually degrade the rural character of Sonoma County. Adverse visual changes to the rural character are discussed in ***Section 4.11 Visual Resources***. While such conflicts could occur from projected residential and commercial development, such changes would primarily result from the development of agricultural processing and visitor-serving uses.

Goals **AR-5** and **AR-6** of the Agricultural Resources Element would promote the development of new agricultural processing facilities (e.g., wineries), support services (e.g., vendors of farm supplies), and visitor-serving uses (e.g., tasting rooms) in rural agrarian areas as value added support to agricultural production. Development of these uses is discussed in greater detail in *Impact 4.8-2 Agricultural Processing and Support Uses* and *Impact 4.8-3 Agricultural Tourism.*

While the development of agricultural processing and visitor-serving uses would have many beneficial economic impacts and would protect against future loss of the county's agricultural base, these types of development result in land use conflicts. Such development could generate increased noise levels, increased truck and tourist traffic, pedestrian / bicyclist and vehicle conflicts, be at a greater intensity of use than that of surrounding areas, and / or require the modification of existing agricultural practices (e.g., to accommodate new visitor-serving uses). Therefore, projected agricultural processing and visitor-serving development could be incompatible with existing rural residential development, agricultural operations, and other land uses.

The *Draft GP 2020* contains policies and programs that would reduce these land use conflicts. Policies **AR-5a** through **AR-5g** and **AR-6a** through **AR-6h** of the Agricultural Resources Element would limit the size, location, and density of agricultural processing and visitor-serving uses.

If developed, adopted, and implemented, **Noise Program 2: Adopt a Noise Ordinance** and Policies **NE-1c**, **NE-1h**, **NE-1k**, and **NE-1m** would reduce noise impacts through the development and incorporation of noise standards into the zoning code as well as through potential acoustical monitoring of discretionary projects.

Policies **LU-4b** through **LU-4d** and **CT-5e** would continue to require that infrastructure improvements (e.g., traffic mitigations) be completed prior to, or in conjunction with, new development to meet the County's level-of-service criteria. This would reduce traffic impacts associated with the introduction

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[42] *Rural Character Design Standards*, CAC Memo, Lisa Posternak, Sonoma County PRMD, December 19, 2003.

of new land uses. Policies **AR-5g** and **AR-6f** would regulate the density of agricultural processing and visitor-serving uses if the concentration of such uses would result in traffic levels that exceed the Circulation and Transit Element's objectives for level of service on a site-specific and cumulative basis. Policies **CT-2s**, **CT-2y** and **CT-2z** would reduce conflicts between pedestrians, bicyclists and vehicles by assuring development compatibility with bicyclists and pedestrians and by providing bicycle and pedestrian walkways. Policy **CT-3e** would reduce safety problems that could arise from such development by requiring proposed projects to implement safety improvements as a condition of approval for such projects.

The *Draft GP 2020* also contains policies specific to individual Planning Areas that would reduce land use conflicts from such development as well as commercial and industrial uses in the rural areas. For example in the Sonoma Coast / Gualala Basin Planning Area, Policies **LU-12a**, and **LU-12d** through **LU-12f** would maintain low development densities in rural areas while generally restricting the location of commercial uses to locations within the unincorporated USAs. Policy **LU-12k**, would avoid the location of recreation and visitor-serving and resource related commercial and industrial uses in close proximity to one another.

Implementation of the above policies and programs and mitigation measures would reduce land use conflicts but would not fully prevent future complaints in rural areas. Therefore this would be a significant impact.

Mitigation Measure 4.1-3 No mitigation available beyond the *Draft GP 2020* policies discussed in the impact analysis above.

Significance After Mitigation This would be a significant unavoidable impact. (**SU**)

Impact 4.1-4 Affordable Housing

Development of affordable housing projects consistent with the Draft GP 2020 may be incompatible with established land uses adjacent to the proposed locations. This would be a less-than-significant impact. ***(LTS)***

As described in the environmental setting, Objective **HE-3.2** of the Housing Element would provide sites for an additional 500 affordable housing units for very low- or low-income households on parcels in Urban Service Areas designated on the land use maps. These projects could result in land use conflicts as some of the proposed sites would have the potential for incompatibility between existing land uses and residential development. While it is acknowledged that development of affordable housing would be of substantial public benefit, preliminary review of the proposed sites identified potential adverse environmental impacts. [43]

Of the ten proposed sites, three (A2, A6, and A8) would be located in close proximity (within 100 feet) of heavy industrial uses. Two sites, A1 and A6, would be located within 100 feet of the 65 dB CNEL contour at Sonoma County Airport and from a significant stationary noise source, respectively. [44]

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[43] *Affordable Housing Combining District*, CAC Memo, Denise Peter, Sonoma County PRMD, December 4, 2003.

[44] *Affordable Housing Combining District*, CAC Memo, Denise Peter, Sonoma County PRMD, December 4, 2003.

The location of these sites within the commercial and industrial areas could result in incompatibilities between residents and manufacturing and similar uses. Although housing in these locations would offer the potential benefits of workers living in close proximity to jobs, siting, and design of this housing could raise noise, traffic safety, and other problems for residents. Careful design control at the project level would be important in order to reduce these conflicts.

The *Draft GP 2020* contains a number of policies that would reduce such impacts. Policies **NE-1b** and **NE-1g** would enforce State Noise Insulation Standards and avoid noise sensitive land use development in noise impacted areas unless effective measures are included to reduce noise levels. Policy **AT-3g** identifies appropriate mitigations that could be undertaken in the event noise standards from airport operations are exceeded including purchases assurances and acoustical treatments.

While analysis of site-specific impacts is beyond the scope of this EIR and would be evaluated as part of a separate environmental review for the individual project, it is important to note that if a proposed site were found to be unacceptable during such review, alternate sites better suited to residential use would be available as the proposed sites represent approximately 133 percent of the amount of land needed to accommodate the goal of 500 units (i.e., at 20 units per acre). As a result, at a programmatic level of analysis, the policies of the *Draft GP 2020* would be adequate to reduce potential impacts to a less-than-significant level.

Mitigation Measure 4.1-4 None required.

4.2 TRANSPORTATION

4.2 TRANSPORTATION

Transportation – Environmental Setting

Sonoma County has a variety of transportation systems, including roads, public transit, a railroad, bicycle and pedestrian facilities. These are described below, including existing travel characteristics, in the following sections.

HIGHWAY AND ROADWAY SYSTEM

The County owns and maintains 1,388 centerline [1] miles of roadways. This number has decreased slightly since the existing *General Plan* was prepared in the late 1980s, primarily due to annexations (e.g., Windsor), and in lesser part due to road abandonment or relinquishment. The reconstruction value of this infrastructure was estimated at $1.4 billion in 2001. [2] The California State Department of Transportation (Caltrans) owns and maintains more than 237 centerline miles of highway, with more than three-quarters of it in the rural portions of the county. The State highways are among the most heavily traveled routes (e.g., US 101), and because of this, carry half or more of the daily vehicle miles traveled (VMT) in Sonoma County.

Freeways

Freeways are primarily through highways for carrying large volumes of interurban, regional and interstate traffic, although they may carry considerable local traffic in large urbanized areas. Freeways are designed to separate two or more travel lanes with a median, to prohibit access from abutting property and to limit access from cross streets by providing grade separations. Access to a restricted number of cross streets may be provided at grade-separated interchanges. Acceleration and deceleration lanes are provided at interchanges. The desired minimum spacing between interchanges is one mile in urban areas, and two miles in rural areas. Auxiliary lanes may be provided from one interchange to the next in densely developed urban areas with closely spaced interchanges, or where a considerable amount of traffic travels only between two interchanges.

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1 Centerline miles are the number of unduplicated route miles of street or highway, ignoring the number of lanes.

2 Sonoma County Transportation Authority (SCTA), 2001 Countywide Transportation Plan for Sonoma County, Adopted September 10, 2001, page 23. Estimate is based on data from the County of Sonoma.

Primary Arterials

Arterials are major through highways that carry large volumes of traffic over long distances. Although they are principally intended to serve intercity travel, they may also provide routes of regional significance in less heavily traveled corridors and some local traffic in larger urban areas. Arterials are intended to serve a through-traffic function and not to provide access to property. The number of lanes of traffic may vary from two to four or more. Continuous or intersection-turn lanes may be provided. Right-of-way widths [3] may vary from 56 to 84 feet.

Secondary Arterials

Secondary arterials in general serve the same function as primary arterials but either carry a lesser volume of traffic or carry a higher proportion of local traffic over shorter distances. Within urban areas, these arterials may connect locations with large-scale traffic generators. Although access to abutting land is permitted, it is secondary to the traffic function of the arterial.

Major Collectors

This class of highways primarily serves internal traffic within a sub-county local area and carries this traffic to the arterial system. Major collector highways do not ordinarily carry a high proportion of long through trips and are not, of necessity, continuous for great lengths. In urban areas, collectors may carry traffic volumes in excess of 10,000 vehicles per day, although in rural areas volumes are considerably less.

Minor Collectors

This class of highways serves the same function as major collectors, but occurs primarily in rural areas where traffic volumes are lower but the length of trips and the roadway are usually longer.

Local Roads

The sole function of these roadways is primarily to provide access to adjacent land. These highways make up a large percentage of the County's roadway network but carry a small proportion of the total vehicle miles of travel.

CONDITION OF ROADS

Physically, the county road system suffers from a number of problems:

- Restricted maintenance budgets over the past 25 years have resulted in poor pavement conditions. Sonoma County's roads average a Pavement Condition Index (PCI) of 46, whereas a PCI of 80 is considered optimum. [4] This is the lowest of any county in the Bay Area, and the county has one of the largest deferred maintenance backlogs in the Bay Area.

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[3] Right of way is the publicly owned land for a street or highway, including parking lanes, bike lanes, sidewalks, drainage features (e.g., curb and gutter), lighting, landscaping, and safety area (e.g., guardrail).

[4] Metropolitan Transportation Commission. *Bay Are Transportation: State of the System 2002*, page 67.

- Many county roads lack standard shoulders or pedestrian walking areas to enhance the safety and pleasure of walking and cycling.

- Roads (including state highways and freeways) were subject to serious flooding problems in the 1990s.

- Portions of some county roads do not meet current safe sight stopping distance standards.

EXISTING TRAVEL CHARACTERISTICS

This section describes existing travel and transportation characteristics in Sonoma County, based on several sources of information. Trips are normally categorized into several purposes for analytical reasons. Vehicle occupancies are important, because they relate to how many vehicles are needed to move a given number of people around. In order to evaluate ridesharing and transit, trips are usually first calculated in terms of person-trips; i.e. two people driving together to work would be one vehicle trip, but two person trips.

Bay Area Travel Survey 2000

The Bay Area Travel Survey (BATS) 2000 included approximately 1,000 Sonoma County households and was conducted by the Metropolitan Transportation Commission (MTC), which is the regional transportation planning agency for the nine-county Bay Area. Among the key findings were:

- Approximately 16.8 percent of daily commute (to work) trips are made in the AM peak hour (7:30 – 8:30 AM), and 14.4 percent in the PM peak hour (4:30 – 5:30 PM). This represents a "flattening" of the peak hour; this percentage has dropped since the last survey was conducted in 1990 as more trips spread to the "shoulders" of the peak hours;

- Of non-work trips, 2.6 percent of non-work trips between home and "attraction" were by transit, but between two non-home locations was only 0.9 percent;

- Use of alternative travel modes (i.e., those other than driving alone) for inter-county commute trips tends to be higher than for within-county trips. Approximately 8.2 percent of inter-county trips are by transit; 10.1 percent are by carpool;

- Approximately 1 in every 8 trips (considering all purposes) involves a vehicle trip to another county on a weekday; and

- Travel times and average vehicle occupancy for trips varies by purpose, as shown in **Exhibit 4.2-1**.

Exhibit 4.2-1
Travel Times and Vehicle Occupancy

Trip Purpose (between)	*Mean Travel Time minutes*	*Median Travel Time Minutes*	*Average Vehicle Occupancy (AVO) persons/vehicle*
Home - Work	24.2	17.1	1.09
Home - Other (non-work)	16.8	12.2	1.39
Other - Other	15.6	10.6	1.18

Source: Bay Area Travel Survey, 2000. Vehicles are private vehicles (i.e., excluding buses).

The mean is the arithmetic average; the median represents the point where half of the respondents indicate a shorter time, and half indicated a longer time. Because of a small number of people who make very long trips, the mean is usually greater than the median. Vehicle occupancy rates have declined somewhat since the existing *General Plan* for all three trip purposes.

Census 2000

The federal Census 2000 included a detailed long form sample of approximately one in every six Sonoma County households. The Census asks questions about home-to-work trips only, and found that 74.7 percent of workers drove alone for their commute; 12.6 percent carpooled; 2.4 percent used public transit; 3.9 percent bicycled or walked; and 5.4 percent worked at home. These *mode shares* are fairly stable since 1990, although the bicycle / walk mode has dropped slightly, and the work-at-home share has increased slightly.

- The mean (average) travel time to work is less than 27 minutes, with only 18 percent reporting a commute of 45 minutes or more.

- The mean (average) number of vehicles available per household was 1.9, the same as in 1990, with fewer than six percent of households reporting no vehicle available to them.

- Fewer than 20 percent (19.6 percent) of Sonoma County workers commute to jobs outside the county, a small decrease since 1980. However, of these *out commuters*, 47 percent work in Marin County and 21 percent in San Francisco, both of which are served by the highly congested US 101 corridor. The actual number, as well as the percentage, of trips to San Francisco has dropped since the 1990 Census. The number of residents commuting to Marin has increased by more than 19 percent since 1990.

- The number of "in-commuters" (who work in Sonoma County but live in other counties) has risen 50 percent between the 1990 and 2000 censuses, from 9,326 to 14,000 workers.[5] Marin supplies more workers than any other county (nearly 3,500), although there was little increase in this figure since 1990. The greatest increase was found in the east-west oriented commute from Solano County, where the in-commuters grew by 111 percent (a numerical increase of more than

[5] Totals exclude workers report from a commute that would not be possible on a daily basis using ground modes, e.g., someone reporting a home location as Los Angeles or Hawaii.

1,200 workers). Other counties which, in 2000, supplied more than a thousand workers include: Contra Costa (1,037); Lake (1,415); Mendocino (1,023); and Napa (2,146).

SONOMA COUNTY TRAVEL MODEL

Sonoma County travel demand has been estimated for 2000 using the TRANPLAN travel model, measured by the number of person-trips made on an average weekday and during the weekday peak period. [6] Demand estimates are further stratified by trip purpose and by mode, as shown in **Exhibit 4.2-2**. Modeling encompassed 372 traffic analysis zones within Sonoma County and 18 external zones, including seven in Marin, two in San Francisco and the Peninsula, six in the East Bay, and three in areas north of Sonoma County, for a total of 400 zones. Model validation was based on an extensive set of traffic counts available from the Sonoma County Public Works Department, Caltrans, and the cities within Sonoma County.

The model considers both travel supply and demand. Land use data from the General Plan update and ABAG *Projections 2002* data are used to determine the travel demand in a given year. For each traffic analysis zone, information is provided on the number of residential units (single family, multi-family, senior, and mobile home). Non-residential data include square footage of office, industrial, institutional, and retail uses. It also includes hotel/motel rooms, schools, and parks. The supply of transportation services is input in the form of a *network*, which includes the capacity of each available highway segment, the number of lanes, average speed, and capacity of each segment.

The model then connects homes with activities (or *attractors*) using the widely used gravity trip distribution method. The gravity model considers not only how attractive a zone is as a potential destination, but also how long it takes to get to the destination under congested travel conditions. Households are presumed to prefer destinations that are closer to them rather than farther away, all other things being equal. The model next considers the choice of travel mode (auto versus transit), and then the auto trips are assigned to the quickest (shortest time path) in the network, considering congestion.

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6 Travel demand estimates were prepared for roadway segments rather than intersections due to the large land area covered by the modeling exercise.

Exhibit 4.2-2
2000 Estimated Person Trips, by Purpose

Trip Purpose	*Number of Person Trips*	*Percent of Total*
Home-based work (commute)	430,000	23.3
Home-based non-work	1,098,000	59.5
Non-home based	318,000	17.2
Total	***1,846,000***	***100.0***

Source: Dowling Associates, Sonoma County Travel Model 2002; values are rounded.

Less than one-quarter of all weekday trips are for commute purposes (shown as home-based work trips above). Although modest in number, commute trips have a disproportionate impact on the transportation system's performance for several reasons. They tend to be longer trips than the others; they tend to be concentrated in a few hours of the day (7-9 AM and 4-6 PM); and they tend to result in more vehicle trips per person than other trip types. For these reasons, commute trips are generally emphasized in transportation planning studies.

As of December 31, 2001, there were more than 410,000 autos, trucks, vans, pickups, and RVs registered in Sonoma County. Motor vehicle ownership in the county tends to be somewhat higher than the Bay Area average. The Sonoma County average number of vehicles per household is 2.38, while the Bay Area average is 2.28. The average number of persons per vehicle is lower in Sonoma County at 1.14, compared to the Bay Area average of 1.28. [7] The higher auto ownership rates reflect the county's heavy dependency on personal vehicles for transportation as a result of dispersed land uses, an extensive road network, and the rural nature of much of the county. There are also more persons per household in Sonoma County relative to the other Bay Area counties, also contributing to more vehicles per household.

EXISTING TRAFFIC VOLUMES

Exhibit 4.2-3 shows the average daily traffic (ADT) on county roadways, i.e., the total number of vehicles on a roadway during a 24-hour period on an average weekday during the year. **Exhibits 4.2-4** and **4.2-5** show the AM and PM peak hour traffic volumes on a typical weekday in 2001-2003. Peak hour volumes are typically between eight and 12 percent of the daily volume, although may be more (or less) depending on the type of trips served, whether they act as congestion relievers on other routes, and other factors.

A description of traffic congestion conditions is provided below, in the section titled, *Existing Congestion Locations*.

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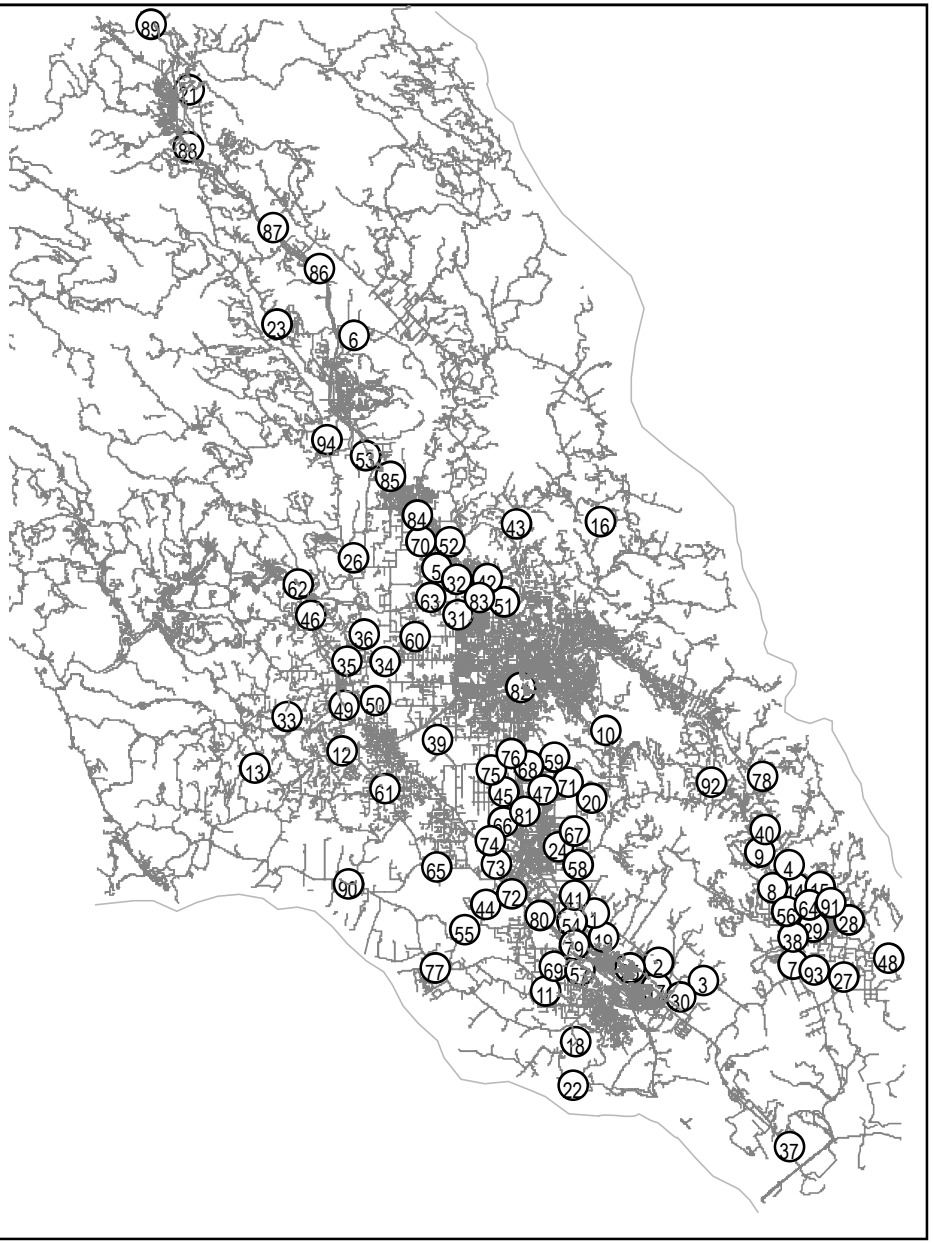
7 Metropolitan Transportation Commission "data mart" website, www.mtc.ca.gov, derived from various sources. Date of information late 2001/early 2002. Data includes vans, RVs, and trucks, but excludes trailers.

Exhibit 4.2-3
Sonoma County Average Daily Traffic (ADT) Volumes - 2001

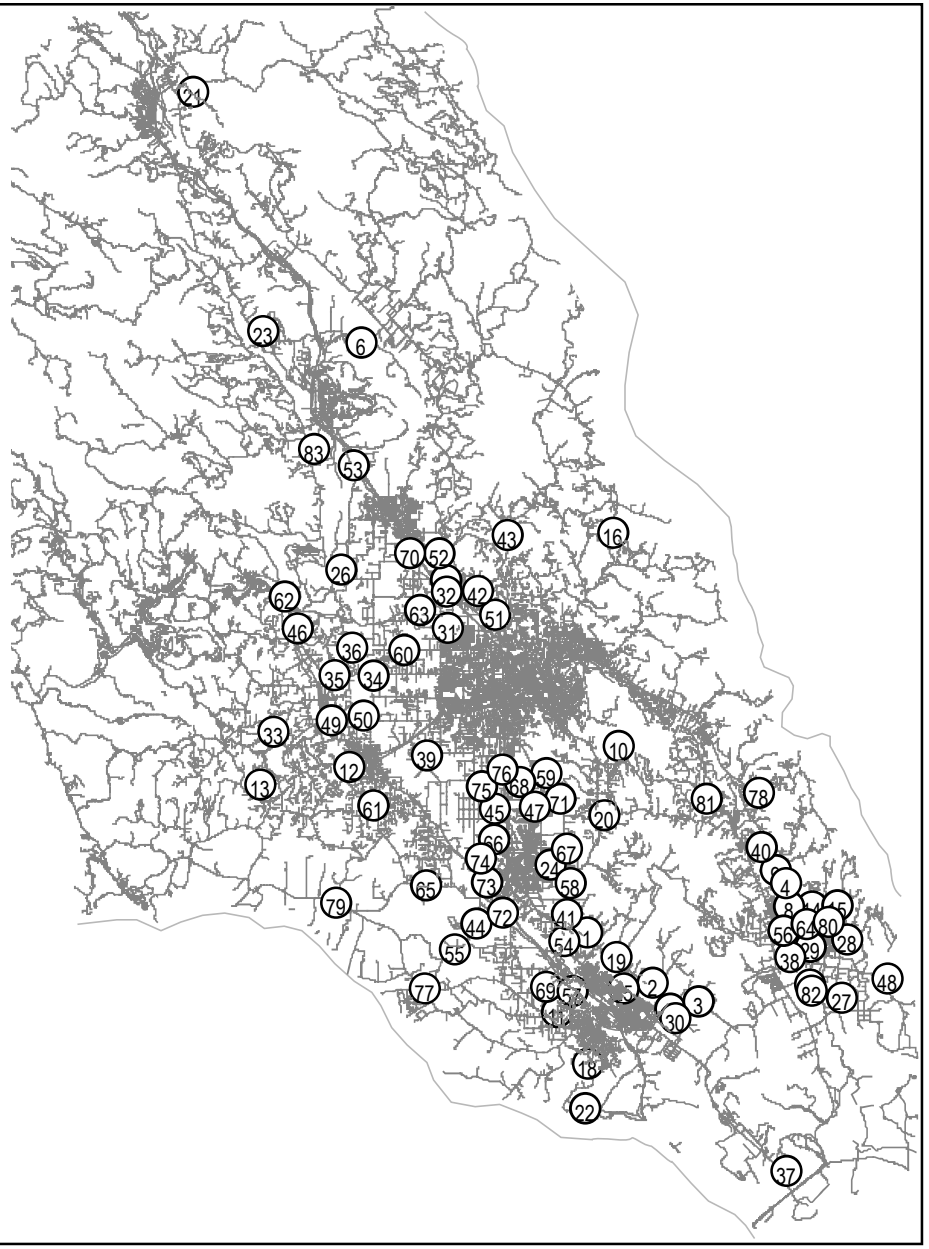
#	Name	ADT
1	Adobe Rd. W/ Corona Rd.	13,500
2	Adobe Rd. E/ E. Washington St.	13,600
3	Adobe Rd. E/ Frates Rd.	15,600
4	Agua Caliente Rd. E/ Arnold Dr.	3,700
5	Airport Blvd. E/ Regional Pkwy.	13,000
6	Alexander Valley Rd. W/ Lytton Station Rd.	3,900
7	Arnold Dr. N/ Watmaugh Rd.	16,200
8	Arnold Dr. N/ Verano Ave.	17,400
9	Arnold Dr. N/ Agua Caliente Rd.	12,300
10	Bennett Valley Rd. W/ Grange	8,000
11	Bodega Ave. W/ Thompson Ln.	7,600
12	Bodega Hwy. W/ Watertrough	10,200
13	Bohemian Hwy. N/ Freestone Flat	2,000
14	Boyes Blvd. W/ Railroad Ave.	5,000
15	Boyes Blvd. E/ Riverside Rd.	7,700
16	Calistoga Rd. S/ Porter Creek	5,000
17	Casa Grande Avenue S/ Adobe	2,300
18	Chileno Valley Rd. W/ Spring Hill	1,300
19	Corona Rd. S/ Adobe Rd.	4,900
20	Crane Canyon Rd. E/ Petaluma Hill Rd.	5,900
21	Crocker Rd. W/ River Rd.	3,300
22	D St. S/ San Antonio Rd.	4,400
23	Dry Creek Rd. N/ Lambert Bridge	2,800
24	East Cotati Ave. W/ Petaluma Hill	8,400
25	East Washington St. S/ Adobe	6,700
26	Eastside Rd. N/ Trenton-Healdsburg Rd.	1,600
27	Eighth St. East N/ S.H. 12/ 121	1,600
28	Eighth St. East S/ East Napa Rd.	3,500
29	Fifth St. West N/ Leveroni Rd.	10,200
30	Frates Rd. S/ Adobe Rd.	8,700
31	Fulton Rd. S/ River Rd.	17,700
32	Fulton Rd. N/ River Rd.	15,400
33	Graton Rd. W/ Green Hill Rd.	3,600
34	Guerneville Rd. E/ Frei Rd.	12,000
35	Guerneville Rd. E/ Vine Hill Rd.	9,300
36	Laguna Rd. N/ Guerneville Rd.	2,700
37	Lakeville Rd. N/ Hwy. 37	16,200
38	Leveroni Rd. E/ Arnold Dr.	8,700
39	LLano Rd. N/ Ludwig Ave.	6,400
40	Madrone Rd. W/ S.H. 12	5,100
41	Main St. S/ Adobe Rd.	11,200
42	Mark West Springs Rd. E/ Hwy 101	18,900
43	Mark West Springs Rd. W/ Porter Creek Rd.	8,100
44	Mecham Rd. S/ Dump	2,400
45	Millbrae Ave. E/ Stony Point Rd.	4,200
46	Mirabel Rd. S/ Trenton Rd.	7,500
47	Mountain View E/ Santa Rosa Ave.	4,00
48	Napa Rd. E/ Burndale Rd.	13,100
49	Occidental Rd. E/ Mill Station Rd.	5,800
50	Occidental Rd. W/ Sanford Rd.	11,400
51	Old Redwood Hwy. S/ Ursiline Rd.	12,500
52	Old Redwood Hwy. N/ Fulton Rd.	11,000
53	Old Redwood Hwy. N/ Eastside	6,600
54	Old Redwood Hwy. N/ Ely Rd.	19,500
55	Pepper Rd. E/ Walker Rd.	3,600
56	Petaluma Ave. E./ Arnold Dr.	5,900
57	Petaluma Blvd. North N/ Skillman	21,300
58	Petaluma Hill Rd. N/ Roberts	15,900
59	Pataluma Hill Rd. N/ Snyder Ln.	17,800
60	Piner Rd. E/ Willowside Rd.	2,400
61	Pleasant Hill Rd. S/ Watertrough	2,600
62	River Rd. W/ Mirabel Rd.	15,300
63	River Rd. W/ Fulton Rd.	14,100
64	Riverside Dr. N/ S.H. 12	12,000
65	Roblar Rd. E/ Canfield Rd.	1,600
66	Rohnert Park Exp. E/ Stony Point	10,000
67	Rohnert Park Exp. W/ Petaluma Hill Rd.	6,600
68	Santa Rosa Ave. N/ Mountain View	18,200
69	Skillman Ln. E/ Thompson Ln.	3,500
70	Skylane Blvd. N/ Airport Blvd.	4,900
71	Snyder Ln. S/ Petaluma Hill Rd.	9,500
72	Stony Point Rd. S/ Mecham Rd.	11,000
73	Stony Point Rd. N/ Roblar Rd.	14,800
74	Stony Point Rd. N/ S.H. 116	11,500
75	Stony Point Rd. N/ Scenic Ave.	17,00
76	Todd Rd. E/ Stony Point Rd.	6,800
77	Tomales Rd. W/ Bodega Ave.	3,100
78	Trinity Rd. E/ S.H. 12	1,000
79	US 101 S/ Petaluma Blvd. South	78,000
80	Us 101 at Cotati Grade	90,000
81	US 101 S/ Todd Rd.	95,000
82	US 101 S/ Hwy. 12	114,000
83	US 101 S/ River Rd.	82,000
84	US 101 S/ Shiloh Rd.	64,000
85	US 101 S/ Healdsburg	37,500
86	US 101 N/ Independence Ln.	22,300
87	US 101 N/ Hwy. 128	19,700
88	US 101 S/ South Cloverdale Exit	19,600
89	US 101 at Mendocino County Line	12,600
90	Valley Ford Rd. E/ Gericke Rd.	4,100
91	Verano Ave. W/ S.H. 12	11,000
92	Warm Springs N/ Sonoma Mt. Rd.	3,600
93	Watmaugh Rd. E/ Arnold Dr.	3,100
94	Westside Rd. N/ Felta Rd.	2,700



Source: Dowling Associates, Inc., December 2003

Exhibit 4.2-4
Sonoma County Weekday AM Peak Hour Traffic Volumes - 2001

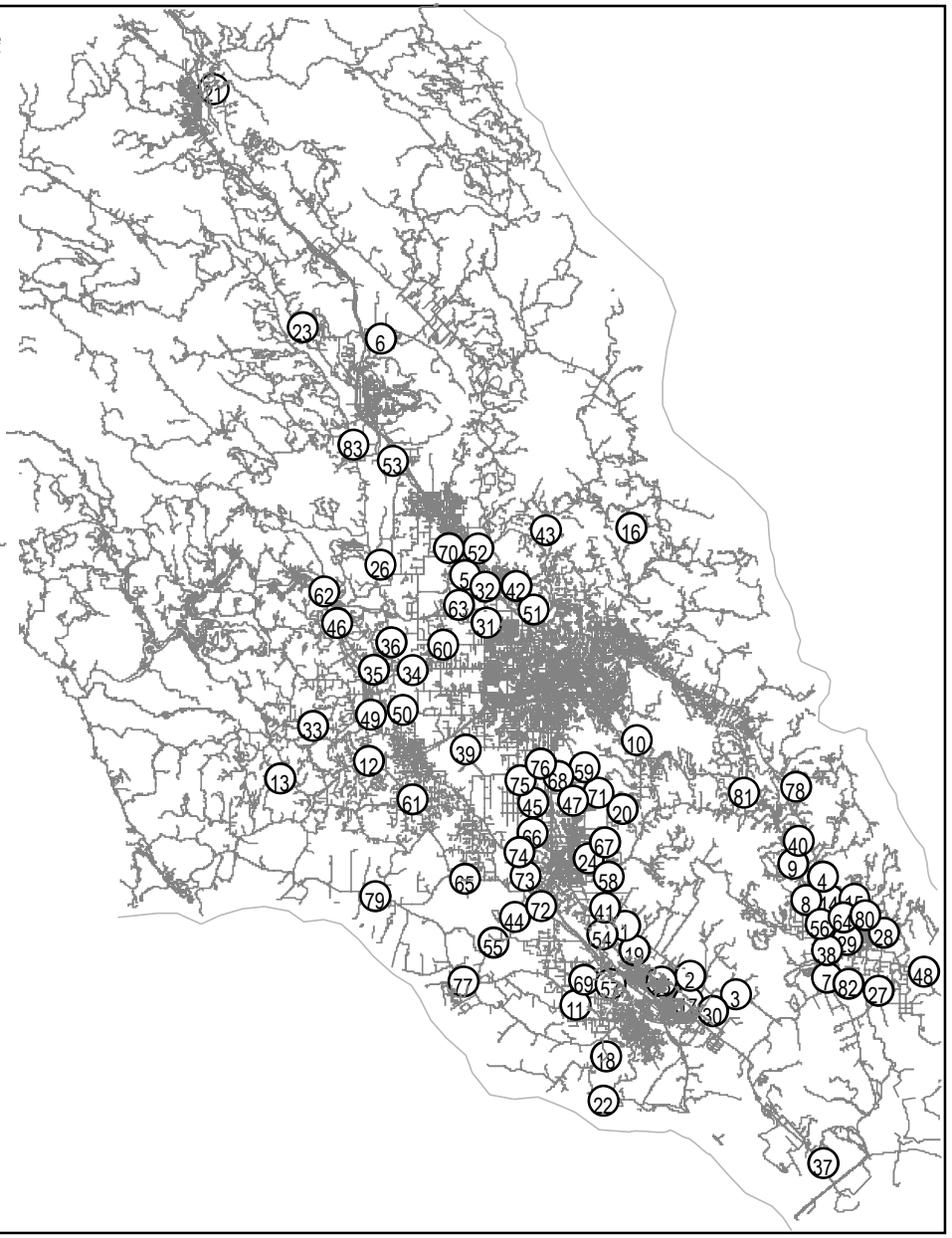
#	Name	Volume
1	Adobe Rd. W/ Corona Rd.	1,030
2	Adobe Rd. E/ E. Washington St.	1,210
3	Adobe Rd. E/ Frates Rd.	1,160
4	Agua Caliente Rd. E/ Arnold Dr.	360
5	Airport Blvd. E/ Regional Pkwy.	1,160
6	Alexander Valley Rd. W/ Lytton Station Rd.	270
7	Arnold Dr. N/ Watmaugh Rd.	1,160
8	Arnold Dr. N/ Verano Ave.	1,350
9	Arnold Dr. N/ Agua Caliente Rd.	903
10	Bennett Valley Rd. W/ Grange	600
11	Bodega Ave. W/ Thompson Ln.	510
12	Bodega Hwy. W/ Watertrough	730
13	Bohemian Hwy. N/ Freestone Flat	140
14	Boyes Blvd. W/ Railroad Ave.	340
15	Boyes Blvd. E/ Riverside Rd.	580
16	Calistoga Rd. S/ Porter Creek	360
17	Casa Grande Avenue S/ Adobe	290
18	Chileno Valley Rd. W/ Spring Hill	110
19	Corona Rd. S/ Adobe Rd.	350
20	Crane Canyon Rd. E/ Petaluma Hill Rd.	430
21	Crocker Rd. W/ River Rd.	200
22	D St. S/ San Antonio Rd.	350
23	Dry Creek Rd. N/ Lambert Bridge	180
24	East Cotati Ave. W/ Petaluma Hill	560
25	East Washington St. S/ Adobe	540
26	Eastside Rd. N/ Trenton-Healdsburg Rd.	190
27	Eighth St. East N/ S.H. 12/ 121	120
28	Eighth St. East S/ East Napa Rd.	270
29	Fifth St. West N/ Leveroni Rd.	670
30	Frates Rd. S/ Adobe Rd.	670
31	Fulton Rd. S/ River Rd.	1,180
32	Fulton Rd. N/ River Rd.	1,060
33	Graton Rd. W/ Green Hill Rd.	270
34	Guerneville Rd. E/ Frei Rd.	1,030
35	Guerneville Rd. E/ Vine Hill Rd.	700
36	Laguna Rd. N/ Guerneville Rd.	260
37	Lakeville Rd. N/ Hwy. 37	1,130
38	Leveroni Rd. E/ Arnold Dr.	600
39	LLano Rd. N/ Ludwig Ave.	480
40	Madrone Rd. W/ S.H. 12	400
41	Main St. S/ Adobe Rd.	920
42	Mark West Springs Rd. E/ Hwy 101	1,300
43	Mark West Springs Rd. W/ Porter Creek Rd.	540
44	Mecham Rd. S/ Dump	220
45	Millbrae Ave. E/ Stony Point Rd.	240
46	Mirabel Rd. S/ Trenton Rd.	520
47	Mountain View E/ Santa Rosa Ave.	270
48	Napa Rd. E/ Burndale Rd.	930
49	Occidental Rd. E/ Mill Station Rd.	440
50	Occidental Rd. W/ Sanford Rd.	760
51	Old Redwood Hwy. S/ Ursiline Rd.	940
52	Old Redwood Hwy. N/ Fulton Rd.	880
53	Old Redwood Hwy. N/ Eastside	400
54	Old Redwood Hwy. N/ Ely Rd.	1,660
55	Pepper Rd. E/ Walker Rd.	330
56	Petaluma Ave. E./ Arnold Dr.	480
57	Petaluma Blvd. North N/ Skillman	1,290
58	Petaluma Hill Rd. N/ Roberts	970
59	Pataluma Hill Rd. N/ Snyder Ln.	1,100
60	Piner Rd. E/ Willowside Rd.	170
61	Pleasant Hill Rd. S/ Watertrough	220
62	River Rd. W/ Mirabel Rd.	1,100
63	River Rd. W/ Fulton Rd.	970
64	Riverside Dr. N/ S.H. 12	890
65	Roblar Rd. E/ Canfield Rd.	120
66	Rohnert Park Exp. E/ Stony Point	550
67	Rohnert Park Exp. W/ Petaluma Hill Rd.	500
68	Santa Rosa Ave. N/ Mountain View	1,100
69	Skillman Ln. E/ Thompson Ln.	300
70	Skylane Blvd. N/ Airport Blvd.	480
71	Snyder Ln. S/ Petaluma Hill Rd.	640
72	Stony Point Rd. S/ Mecham Rd.	970
73	Stony Point Rd. N/ Roblar Rd.	1,290
74	Stony Point Rd. N/ S.H. 116	870
75	Stony Point Rd. N/ Scenic Ave.	1,410
76	Todd Rd. E/ Stony Point Rd.	530
77	Tomales Rd. W/ Bodega Ave.	230
78	Trinity Rd. E/ S.H. 12	80
79	Valley Ford Rd. E/ Gericke Rd.	280
80	Verano Ave. W/ S.H. 12	680
81	Warm Springs N/ Sonoma Mt. Rd.	280
82	Watmaugh Rd. E/ Arnold Dr.	230
83	Westside Rd. N/ Felta Rd.	200



Source: Dowling Associates, Inc., December 2003

Exhibit 4.2-5
Sonoma County Weekday PM Peak Hour Traffic Volumes - 2001

#	Name	Volume
1	Adobe Rd. W/ Corona Rd.	1,420
2	Adobe Rd. E/ E. Washington St.	1,250
3	Adobe Rd. E/ Frates Rd.	1,350
4	Agua Caliente Rd. E/ Arnold Dr.	360
5	Airport Blvd. E/ Regional Pkwy.	1,490
6	Alexander Valley Rd. W/ Lytton Station Rd.	420
7	Arnold Dr. N/ Watmaugh Rd.	1,400
8	Arnold Dr. N/ Verano Ave.	1,630
9	Arnold Dr. N/ Agua Caliente Rd.	1,160
10	Bennett Valley Rd. W/ Grange	1,000
11	Bodega Ave. W/ Thompson Ln.	670
12	Bodega Hwy. W/ Watertrough	900
13	Bohemian Hwy. N/ Freestone Flat	190
14	Boyes Blvd. W/ Railroad Ave.	450
15	Boyes Blvd. E/ Riverside Rd.	710
16	Calistoga Rd. S/ Porter Creek	500
17	Casa Grande Avenue S/ Adobe	210
18	Chileno Valley Rd. W/ Spring Hill	170
19	Corona Rd. S/ Adobe Rd.	600
20	Crane Canyon Rd. E/ Petaluma Hill Rd.	820
21	Crocker Rd. W/ River Rd.	300
22	D St. S/ San Antonio Rd.	560
23	Dry Creek Rd. N/ Lambert Bridge	290
24	East Cotati Ave. W/ Petaluma Hill	830
25	East Washington St. S/ Adobe	560
26	Eastside Rd. N/ Trenton-Healdsburg Rd.	220
27	Eighth St. East N/ S.H. 12/ 121	180
28	Eighth St. East S/ East Napa Rd.	360
29	Fifth St. West N/ Leveroni Rd.	880
30	Frates Rd. S/ Adobe Rd.	820
31	Fulton Rd. S/ River Rd.	1,850
32	Fulton Rd. N/ River Rd.	1,560
33	Graton Rd. W/ Green Hill Rd.	340
34	Guerneville Rd. E/ Frei Rd.	1,130
35	Guerneville Rd. E/ Vine Hill Rd.	920
36	Laguna Rd. N/ Guerneville Rd.	280
37	Lakeville Rd. N/ Hwy. 37	1,920
38	Leveroni Rd. E/ Arnold Dr.	810
39	LLano Rd. N/ Ludwig Ave.	740
40	Madrone Rd. W/ S.H. 12	470
41	Main St. S/ Adobe Rd.	1,070
42	Mark West Springs Rd. E/ Hwy 101	1,630
43	Mark West Springs Rd. W/ Porter Creek Rd.	730
44	Mecham Rd. S/ Dump	260
45	Millbrae Ave. E/ Stony Point Rd.	520
46	Mirabel Rd. S/ Trenton Rd.	700
47	Mountain View E/ Santa Rosa Ave.	450
48	Napa Rd. E/ Burndale Rd.	1,330
49	Occidental Rd. E/ Mill Station Rd.	580
50	Occidental Rd. W/ Sanford Rd.	1,310
51	Old Redwood Hwy. S/ Ursiline Rd.	1,620
52	Old Redwood Hwy. N/ Fulton Rd.	1,090
53	Old Redwood Hwy. N/ Eastside	620
54	Old Redwood Hwy. N/ Ely Rd.	1,990
55	Pepper Rd. E/ Walker Rd.	350
56	Petaluma Ave. E./ Arnold Dr.	510
57	Petaluma Blvd. North N/ Skillman	1,880
58	Petaluma Hill Rd. N/ Roberts	1,800
59	Pataluma Hill Rd. N/ Snyder Ln.	1,960
60	Piner Rd. E/ Willowside Rd.	300
61	Pleasant Hill Rd. S/ Watertrough	240
62	River Rd. W/ Mirabel Rd.	1.360
63	River Rd. W/ Fulton Rd.	1,160
64	Riverside Dr. N/ S.H. 12	1,060
65	Roblar Rd. E/ Canfield Rd.	150
66	Rohnert Park Exp. E/ Stony Point	1,670
67	Rohnert Park Exp. W/ Petaluma Hill Rd.	730
68	Santa Rosa Ave. N/ Mountain View	2,110
69	Skillman Ln. E/ Thompson Ln.	340
70	Skylane Blvd. N/ Airport Blvd.	510
71	Snyder Ln. S/ Petaluma Hill Rd.	1,050
72	Stony Point Rd. S/ Mecham Rd.	1,180
73	Stony Point Rd. N/ Roblar Rd.	1,470
74	Stony Point Rd. N/ S.H. 116	1,200
75	Stony Point Rd. N/ Scenic Ave.	1,790
76	Todd Rd. E/ Stony Point Rd.	670
77	Tomales Rd. W/ Bodega Ave.	380
78	Trinity Rd. E/ S.H. 12	90
79	Valley Ford Rd. E/ Gericke Rd.	370
80	Verano Ave. W/ S.H. 12	970
81	Warm Springs N/ Sonoma Mt. Rd.	400
82	Watmaugh Rd. E/ Arnold Dr.	300
83	Westside Rd. N/ Felta Rd.	260



Source: Dowling Associates, Inc., December 2003

LEVEL OF SERVICE CONCEPT

The concept of levels of service uses qualitative measures that characterize operational conditions within a traffic stream and their perception by motorists and passengers. The descriptions of individual levels of service characterize these conditions in terms of such factors as travel speed (and thus travel time), freedom to maneuver, traffic interruptions, and comfort and convenience. Six levels of service are defined for each type of facility for which analysis procedures are available. The analysis is usually done for peak period driving conditions. "A" represents the best possible service; "F" represents the worst. The characteristics of traffic flow for these various levels of service are summarized in **Exhibit 4.2-6**. Level of service "D" is defined as the stage approaching unstable traffic flow, where speeds and maneuverability are restricted. Although there is more than one way to calculate level of service on highways, the one used here focuses on travel speed as the primary measure of effectiveness in determining the level of service for drivers and their passengers.

Exhibit 4.2-6
Level of Service Thresholds

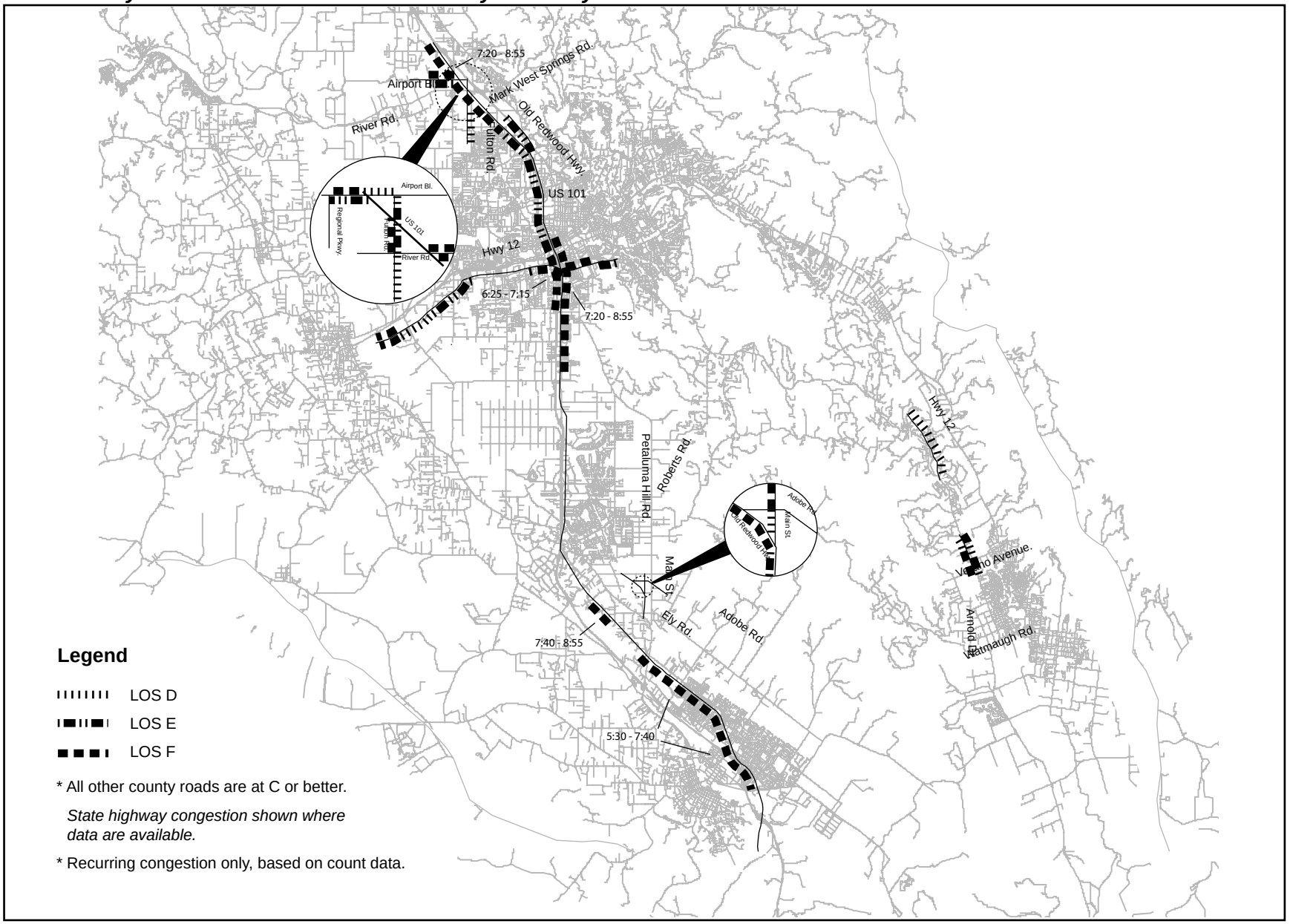
Level of Service	*Freeway*	*Arterial Class I*	*Arterial Class II*	*Arterial Class III*	*Rural-Suburban*	*Rural Arterial Class A*	*Rural Arterial Class B*	*Rural Arterial Class C*	*Rural Arterial Class D*
Range of Free Flow Speed (mph)	---	45 to 35	35 to 30	35 to 25	30 to 45	55 to 45	45 to 35	35 to 30	35 to 25
Typical Free Flow Speed (mph)	65 [a]	40	33	27	Varies	50	40	33	27
A	-	≥ 35	≥ 30	≥ 25	≥ 47	≥ 47	≥ 38	≥ 31	≥ 26
B	≥ 50	≥ 28	≥ 24	≥ 19	≥ 43	≥ 43	≥ 34	≥ 28	≥ 23
C	≥ 47	≥ 22	≥ 18	≥ 13	≥ 35	≥ 35	≥ 28	≥ 23	≥ 19
D	≥ 42	≥ 17	≥ 14	≥ 9	≥ 31	≥ 31	≥ 23	≥ 20	≥ 16
E	≥ 30	≥ 13	≥ 10	≥ 7	≥ 23	≥ 23	≥ 18	≥ 15	≥ 12
F	< 30	< 13	< 10	< 7	< 23	< 23	< 18	< 15	< 12

[a] Freeway design speed

Source: Dowling Associates and Sonoma County Transportation Authority, "Congestion Management Program 1995 Update," December 18, 1995; and input from David Wallace, senior engineer, Sonoma County Transportation and Public Works Department

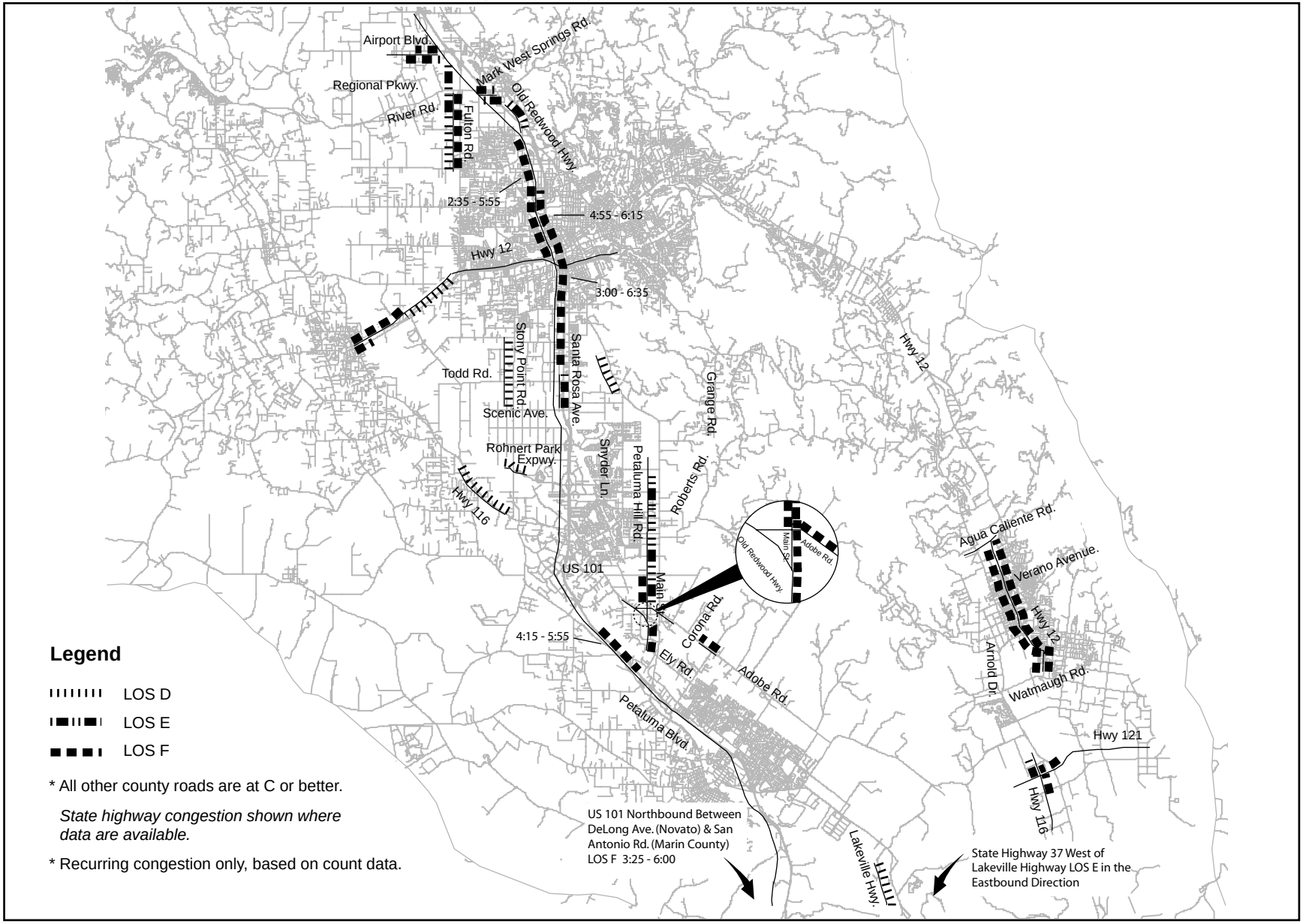
Exhibits 4.2-7 and **4.2-8** show estimated existing traffic congestion at selected points on major roadway segments where the level of service is likely to be at a D, E, or F level of service for the morning and evening peak hour of travel on an average weekday. On average weekdays, the morning peak hour generally occurs between 7 and 9 AM, and the PM peak hour between 4 and 6 PM; most commonly these two peak hours are 7:30-8:30 AM and 4:30-5:30 PM, although there are exceptions (e.g., roads serving schools may experience peak traffic between 3 and 4 PM). Incidents (collisions, stalls, special events) and recreational traffic on weekends are exceptions to this, but do not recur as often or with as great regularity.

Exhibit 4.2-7
AM Weekday Peak Levels of Service on County Roadways - 2001



Source: Dowling Associates, Inc., December 2003

Exhibit 4.2-8
PM Weekday Peak Levels of Service on County Roadways - 2001



Source: Dowling Associates, Inc., December 2003

EXISTING CONGESTION LOCATIONS

US 101 is the county's principal freeway and the primary north-south trunk highway linking the county to Marin and San Francisco to the south and Mendocino County to the north. US 101 is a typical rural freeway constructed to comparatively low standards in the 1950s (compared to existing practice) in order to reduce costs. Much of the freeway is at-grade, with two lane overpasses that use hook [8] on and off-ramps. The median width permits future expansion of the freeway to six lanes, as was completed in southern Santa Rosa between Wilfred Avenue and State Highway 12 in November 2002. Because the model was validated to year 2000 traffic conditions, this improvement was not included in the base year (2000) model, but is included in the 2020 model runs. The highway is currently four lanes for most of its length and does not meet freeway standards at the southern border of the county (frequently known as the Marin-Sonoma Narrows). [9]

Freeways

Caltrans freeway congestion monitoring data for 2000 indicates that the following sections of US 101 experience recurring congestion on weekdays, as shown in **Exhibit 4.2-9**. State Highway 12, the only other freeway in Sonoma County, experiences recurring congestion mainly near US 101 and its two end points in Santa Rosa (Fulton Road and Farmers Lane); for that reason, it is not regularly monitored by Caltrans. Due to budget constraints, Caltrans does not currently monitor freeway-to-freeway travel times (speeds).

Overall, Caltrans estimated that in the year 2000, there were 4,300 vehicle-hours of delay each weekday on Sonoma County freeways, [10] with 23 directional miles of congestion. This is up from an estimated 500 vehicle-hours in 1993. At a value of time of $12/vehicle-hour, this represents approximately $13 million dollars per year of delay-related costs for weekday freeway congestion alone.

Weekend/holiday traffic congestion problems in Cloverdale have largely been eliminated by the Cloverdale Bypass, which opened in the early 1990s. Weekend congestion used to affect US 101 between Rohnert Park and Santa Rosa, but has largely been eliminated by the widening project that opened late in 2002. Weekend congestion has begun to occur between Rohnert Park and Petaluma, however, in peak summer months.

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8 'Hook ramps' are ramps that exit (or enter) the freeway from a paralleling street, using a ramp curved at (approximately) a 90-degree angle. Because hook ramps are often forced into tight situations, they frequently have less than desirable geometrics. The radius of curved approaching the intersection should exceed 30 mph and a tangent of at least 150 feet should be provided between the last curve on the ramp and the ramp terminal.

9 This section, from north of Atherton Avenue in Novato to south of the Petaluma Boulevard south ramps, is classified as an expressway. It lacks access control, i.e., intersections and private property driveways access directly onto 101 at several locations.

10 The exhibit totals up to more than this, because it includes some congestion in Marin County north of Novato.

Exhibit 4.2-9
Year 2000 Weekday Congestion Locations on US 101 Ranked by Delay

Rank in County	*US 101 Segment*	*Direction*	*Time Period*	*Delay (vehicle-hours)*
1	Old Redwood Highway to Kastania Rd	Southbound	5:30-7:40 AM	1,110/day
2	Hopper Ave to Highway 12	Southbound	2:35-5:55 PM	950/day
3	South Santa Rosa Ave to Highway 12[a]	Northbound	3:00-6:35 PM	790/day
4	DeLong Ave (Novato) to San Antonio Rd (Marin County)	Northbound	3:25-6:00 PM	540/day
5 (tie)	College Ave to Hearn Ave	Northbound	7:10-9:15 AM	410/day
5 (tie)	South Santa Rosa Ave -Third St (Santa Rosa)[a]	Northbound	7:10-9:15 AM	410/day
7	Shiloh Rd to River Rd	Southbound	7:20-8:55 AM	330/day
8	Cotati Grade	Northbound	4:10-5:55 PM	130/day
9	Highway 12 to Steele Ln	Northbound	4:55-6:15 PM	100/day
10	Near Pepper Rd on-ramp	Southbound	7:40-8:55 AM	50/day

a Measurements taken prior to widening, which opened November 2002.

Source: Caltrans, District 4 Office of Highway Operations. *Information Memorandum, Year 2000 Bay Area Freeway Congestion Data*, Tables 4A and 4B, June 28, 2001. Congestion is defined as areas where speeds drop below 35 mph for at least 15 minutes on a typical weekday.

State Highway 12 links Sebastopol, Santa Rosa, the Sonoma Valley, and Napa County. It also provides an important connection to the Interstate 80 corridor, including for interstate trucks. Within Santa Rosa, between Fulton Road on the west to Farmers Lane on the east, State Highway 12 is developed to freeway standards. Since 1989, a freeway interchange was added at Stony Point Road, and new viaducts built from E Street easterly to Farmers Lane. A partial freeway interchange (i.e., for westbound traffic) at Farmers Lane was recently completed.

The two lane sections in Sebastopol and in the Sonoma Valley are severely congested on both weekdays and weekends. The congestion is particularly bad during summer months, because of a variety of uses (e.g., wineries, special events, the Infineon Raceway, etc.) that tend to attract large numbers of day and overnight visitors. Although Arnold Drive provides an alternative route for much of the Sonoma Valley, most visitor traffic tends to stay on the state highway. State Highway 12 is also congested at its western terminus in Sebastopol, where it joins State Highway 116.

Main Street (Penngrove) suffers considerable peak period weekday traffic congestion due to drivers avoiding congestion on US 101, and new development in northeast Petaluma and east Rohnert Park. Arnold Drive, River Road, Old Redwood Highway, Bodega Highway, Lakeville Highway, and Petaluma Hill Road have heavy weekday traffic. Todd Road, Llano Road, Crane Canyon Road have congested conditions on weekdays and many roads within incorporated cities have severe congestion.

While some other local roads may need safety or physical improvements, they have adequate levels of service.

Petrified Forest Road suffers from some weekend delays, because it is two lanes with few passing opportunities, and there are a moderate number of heavy vehicles that slow other vehicles on the mountainous grades. This route is a popular connection between northern Napa County and Sonoma County.

The roadways shown in **Exhibit 4.2-10** were performing at Level of Service D or worse during peak hours, indicating congestion at certain peak times of the day.

Weekend congestion affects State Highway 116 which connects the coastal city of Jenner (at Highway 1), Forestville, Sebastopol, Petaluma, and the Sonoma Valley. Highway 116 is a two-lane road with varying widths. Congestion is most severe on weekends due to recreational traffic, particularly in Guerneville and Sebastopol. Since the adoption of the existing *General Plan*, Caltrans has added passing lanes in some areas between Sebastopol and US 101 in Cotati, and also split the highway along two one-way "couplets" south of downtown Sebastopol.

Other State highways with substantial weekend traffic are State Highway 121 (between Highway 37 and the Napa County line), Highway 37, and Highway 1. There are relatively few quantitative measures available for measuring the extent of weekend traffic congestion.

Highway 1 north of Jenner experiences heavy weekend traffic as a result of steep, winding grades; the presence of heavy vehicles (including RVs); presence of coastal development (e.g., Sea Ranch, Gualala) and tourist attractions (e.g., beaches). There are many "sightseeing" trips using this scenic road. River Road, Alexander Valley Road, Dutcher Creek Road, Bohemian Highway, Westside Road, Fort Ross Road, and Lakeville Road also experience weekend congestion from visitor traffic.

Exhibit 4.2-10
Existing Recurring Weekday Congestion Areas on the County Road System

Roadway Segment	Peak Hour Level of Service	
	AM	PM
Arnold Dr north of Highway 121	---	F (SB)*
Adobe Rd east of Corona Rd	---	E (WB)*
Airport Blvd east of Regional Parkway	D-F (WB)* E (EB)*	F (EB & WB)*
Fulton Rd *south of River Rd* *north of River Rd*	 D (NB)* E (NB) & F (SB)	 F (NB)* & D (SB) F (SB)*
Lakeville Highway north of Highway 37	---	D (SB)
Main St (Penngrove) south of Adobe Rd	D (SB)	F (NB)
Mark West Springs Rd east of US 101 to Old Redwood Highway	F (EB & WB)	E (EB & WB)
Old Redwood Highway *north of Ely Rd* *south of Mark West Springs Rd* *Adobe Rd to Main St (Penngrove)*	 E (SB) E (SB)	 F (NB) E (NB)
Petaluma Hill Rd – Adobe Rd. to north of Roberts Rd	---	E (NB)
Rohnert Park Expwy east of Stony Point Rd	---	D (WB)
Santa Rosa Ave north of Mountain View Ave	---	F (NB)
Stony Point Rd north of Scenic Ave	---	D (NB)

Traffic directions indicated in parentheses, e.g., NB is northbound. Blank entry means road operates at a LOS C or better. * Indicates poor level of service due to backups from a single intersection, e.g., all-way stop-controlled intersection.

Source: Dowling Associates, based on traffic counts taken between 2001 and 2003.

TRANSIT SERVICES

Sonoma County is served by a variety of transit operators; they can be conveniently grouped into municipal services, countywide service, and regional transit. Sonoma County Transit and Golden Gate Transit are the two major transit systems serving the county.

Municipal transit services are provided by the cities of Petaluma, Sonoma (Care-A-Van), Santa Rosa, Sebastopol, Healdsburg, and Cloverdale (jitney). The City of Rohnert Park also contracts with Sonoma County transit for local bus service in its city. Most of these systems, with the significant exception of Santa Rosa, operate a few small vehicles over a very limited route system, providing

service mostly to the transit dependent (i.e. those without access to a car). Several new transit services have been instituted since the existing *General Plan*:

- Two new Sonoma-Marin services, the Routes 71 and 75 between the Piner Road Transit Terminal in Santa Rosa, and San Rafael

- New Sonoma-San Francisco route, the Route 90, between the Sonoma Valley and the San Francisco Financial District.

- New and expanded park-and-ride lots. A list of the existing park and ride lots is shown in **Exhibit 4.2-11**.

Current weekday daily transit ridership on Sonoma County Transit (SCT) is approximately 6,000 boarding passengers per day. [11] Weekday ridership in fall 1984 was 3,500 passengers, representing a 71 percent increase in 16 years. Sonoma County Transit ridership has been increasing steadily since service began in July of 1980. Its routes and frequency of service during peak hours on weekdays are shown in **Exhibit 4.2-12**. SCT passenger demand tends to be spread throughout the day, without the heavy commuter component that GGT serves. Therefore, its peak hour service is not as frequent. Most SCT riders do not have a car available for their trip, and a 1987 passenger profile survey indicated that half of riders were 24 years old or younger, and 13 percent were 60 years old or over.

In FY 2000 / 2001, Golden Gate Transit (GGT) carried approximately 3,600 to 3,700 boarding riders to, from, and within Sonoma County on an average weekday. This represents a 12 percent decline in ridership since 1984. [12] Of this total, approximately 25 percent ride to Marin County, and the remainder ride to San Francisco. [13] Since 1996, the decline has been most precipitous in the Sonoma-San Francisco market, while it has been relatively stable in the Sonoma - Marin market.

Total transit ridership for the two systems combined is thus approximately 9,600 boarding trips/day. This represents approximately 0.5 percent of all trips made on an average weekday, although the percentage of commuter trips made by transit is higher.

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11 Derived from information presented in Sonoma County Transit (2001). *Short Range Transit Plan FY 2001 Interim Update*, by Dowling Associates.

12 Ridership in the Fall of 1984 averaged between 4,100 and 4,200 riders per weekday.

13 Some of the Marin riders may be transferring to other buses that then proceed to San Francisco. There is no data to easily estimate this number, and the number is likely to be small. Actual bus ridership is higher for individual routes, because the large number of Marin-San Francisco trips has been excluded here.

Exhibit 4.2-11
Park and Ride Lots

City	Location	Transit	Spaces	Bikes	Lighting
Boyes Hot Springs	Highway 12 at Thomson Ave	GGT SCT	10	No	Yes
Cloverdale	Asti Rd and Citrus Fair Dr	SCT	90	Yes	Yes
Cotati	St Joseph Way at Highway 116 / Old Redwood Highway & US 101	GGT SCT	182	Yes	Yes
Cotati	Redwood Dr and Highway 116	GGT SCT	83	No	Yes
Fulton	River Rd and US 101	SCT	20	No	Yes
Geyserville	Highway 128 and Remmel Rd	SCT	16	No	Yes
Guerneville	Highway 116 at Mill St	SCT	60	Yes	Yes
Healdsburg	Healdsburg Ave at Grant Ave, near US 101	SCT	70	Yes	Yes
Occidental	Bohemian Highway and Graton Rd	SCT	25	Yes	Yes
Petaluma	North Petaluma Blvd at Gossage Ave	GGT SCT	22	Yes	No
Petaluma	US 101 / Highway 116 at Lakeville Highway	PT GGT SCT	111	Yes	Yes
Petaluma	South Petaluma Blvd near US 101	GGT	40	No	No

City	*Location*	*Transit*	*Spaces*	*Bikes*	*Lighting*
Petaluma	Washington St and Payran St	GGT SCT	600	Yes	Yes
Penngrove	Old Redwood Highway at Main St	GGT SCT	30	Yes	Yes
Rohnert Park	Roberts Lake Rd at Golf Course Dr	GGT SCT	170	Yes	Yes
Rohnert Park	US 101 at Rohnert Park Expwy	GGT SCT	150	Yes	Yes
Santa Rosa	Piner Rd & Industrial Way; park in back	SRCB GGT SCT	214	Yes	Yes
Santa Rosa	Highway 12 at Brookwood Ave	SRCB GGT	215	Yes	Yes
Santa Rosa	North of Sonoma County Fairgrounds, under Highway 12 north	SCT GGT	179	Yes	Yes
Schellville	Petaluma Ave at Burnett St	GGT SCT	40	Yes	Yes
Sebastopol	Highway 121 and Highway 116	GGT	47	Yes	No
Windsor	Old Redwood Highway and Starr Rd	SCT	40	Yes	Yes

Transit Abbreviations: GGT = Golden Gate Transit, SCT = Sonoma County Transit, PT = Petaluma Transit, SRCB = Santa Rosa City Bus

Source: http://rideshare.511.org/park-lots

Exhibit 4.2-12
Sonoma County Intercity Transit Services- Fiscal Year 2001 / 02

Route Number(s)	*Route (service end points)*	*Frequency (Buses / Peak Hour)*	*FY 2001 Total Ridership*
10/11	Cotati-SSU	1	63,900
12/14	Rohnert Park (east-west)	1	97,000
20	Russian River	1	144,250
26	Sebastopol – SSU	1	16,050
30	Sonoma Valley	1	138,800
40	Sonoma-Petaluma	1	17,500
44	Petaluma East-Santa Rosa	1	260,550
48	Petaluma West-Santa Rosa	1	197,900
60	Cloverdale-Santa Rosa	2	348,100

Source: SCT schedules dated 8/20/01 to 1/19/02. Local services have been omitted from the above table.

In 2000, the basic fares were $1.10 cents for adults, 90 cents for students, and 55 cents for elderly and handicapped (except for Route 10 and 12, where the fares are somewhat lower because the service is considered local). The Sonoma County Transit fare structure is based on the number of zones through which a rider is traveling. Every zone boundary crossed requires an additional 30 cents to be added to the adult fare, to a maximum of $2.30. Students pay an additional 25 cents per zone, and elderly/handicapped riders 15 cents per zone. Transfers between SCT buses are free for the first fare zone. Each zone beyond this transfer zone requires payment of additional fare at the price described above. Transfers are good for two hours; transfers from other transit systems operating in the county can be used as 25 cents credit off the fare paid.

Mendocino Transit Authority (MTA) also operates an infrequent service along Highway 1 and into Santa Rosa. Route 65 operates from Mendocino, via Fort Bragg, Willits, to Santa Rosa via US 101. Route 95 operates from Point Arena to Santa Rosa via Highway 1, with stops in Bodega Bay and Sebastopol.

Golden Gate Transit (GGT) primarily provides regional inter-county transit service. GGT operated eight transit routes in 2000, some of which subsequently have been reduced due to budget cuts. The basic route offers all-day service between Santa Rosa and San Francisco (Route 80). The other routes are commuter routes which offer only peak hour and peak direction service during morning and evening commute periods. *Peak direction* is defined as toward San Francisco in the morning and from San Francisco in the afternoon. These buses offer fast, express service with relatively few stops. There are few transfers from bus to bus on this system; most people either walk or drive to a Golden Gate Transit stop. Transit ridership for these routes is shown in **Exhibit 4.2-13**.

Exhibit 4.2-13
Golden Gate Transit Services – FY 2000/01

Route Number	Route	Peak Hour Frequency (Buses/Peak)*	FY 2000 / 01 Average Weekday Ridership
71**	Santa Rosa - San Rafael Commute	2-3	100
72	Santa Rosa - San Francisco Commute	3-6	740
74	Santa Rosa - San Francisco Commute	4	870
75	Santa Rosa - Marin Civic Center Commute	2	180
76	Rohnert Park - San Francisco Commute	4-8	660
78**	Santa Rosa - San Francisco Commute	2	120
80	Santa Rosa - San Francisco Basic Service	2	960
90**	Sonoma Valley - San Francisco Commute	1	50
Total	***---***	**-**	***3,680***

Rounded values. Totals may not add due to rounding.
*Peak hour is typically 5-6 AM southbound and 4-5 PM northbound.
**Route cancelled in 2003.

RAILROAD TRANSPORTATION

During the 1980s and 1990s, rail transportation in Sonoma County underwent a number of significant changes. The branch line to Sebastopol was removed, so that today there is only a single north-south line. The Northwestern Pacific Railroad (NWPRR) had provided service to Sonoma County since the 1870s. The NWPRR was owned by the Southern Pacific Railroad, a private corporation, which filed for abandonment of the line in the early 1980s, and then sold the segment south of Novato to the Golden Gate Bridge Highway and Transportation District. The segment between Novato and Healdsburg was sold to the Northwestern Pacific Railroad Authority (NWPRA), a joint powers public agency. In 1990, Proposition 116 was passed by California voters, providing a limited amount of money for improving the NWP. The Sonoma – Marin Area Rail Transit (SMART) District was created by the Legislature in January 2003 replacing the Sonoma – Marin Area Rail Transit Commission. The NWPRA thereupon dissolved, transferring its assets to SMART. SMART is currently in the process of acquiring the southern portion of the line from the Golden Gate Bridge Highway and Transportation District. SMART is charged with implementing passenger service on the NWP from Cloverdale to San Rafael. Freight service on the NWP is under the jurisdiction of the North Coast Railroad Authority (NCRA), which owns the NWP north of Healdsburg and had freight easements on the line south of Healdsburg.

Despite the presence of the physical facility, there is no passenger or freight railroad service currently operated on this line. Rail passenger service was discontinued in the mid-1950s; with rail freight

service discontinued in the 1990s. The line re-opened briefly in 2001, but then was closed by the Federal Railroad Administration due to a failure to meet safe track standards. [14]

The NWP mainline generally parallels US 101 and Highway 37. Prior to discontinuance of freight services, the interchange of cars was made at Schellville Junction, where a connection was made to the Union Pacific (formerly Southern Pacific) Railroad. The NWP line currently continues to north of Eureka, but has suffered from poor maintenance and a decline in business mirroring the decline of the forest products industry in Mendocino and Humboldt Counties, which it was originally built to serve. In the mid-1980s, popular passenger rail excursions were briefly run on summer weekends between Willits and Eureka.

SMART has been examining various options for routes, schedules, equipment, and funding for providing passenger services using the Northwestern Pacific line in Sonoma and Marin Counties. Their plan, currently undergoing environmental review recommends a passenger rail service from Cloverdale to San Rafael, with 14 stations along the route, primarily offering commuter service, but also some mid-day trains, using self-propelled rail cars known as diesel multiple units (DMUs). Trains would initially run every 45 minutes, shortening to 30 minutes after the service is established. [15]

PEDESTRIAN AND BICYCLE TRAVEL

As noted earlier, about four percent of Sonoma County residents' commute trips are made by bicycle and walking, although for other trip purposes it is likely to be higher. A Countywide Bicycle Advisory Committee (CBAC) advises the SCTA on issues related to bicycle planning in the county. In 1997, the CBAC produced the Sonoma County Bikeways Plan, which has been incorporated into the existing *General Plan*. The purpose of the plan is to implement a countywide bike plan, with rails or designated paths that link all cities and are connected to bicycle paths within cities; to provide a safer and comfortable system for those on bikes or on foot; to enhance opportunities for tourism; and to provide a linkage from bike paths to rail stations and bus stops, including a path that follows the NWP right of way to create a north-south linkage through the county.

SMART's proposal for the NWP corridor includes implementation of a pedestrian and bicycle path connecting Marin and Sonoma Counties that would run parallel and next to the rail right-of-way.

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14 "Last Chance for the NWP?" by Dick Spotswood, *The Headlight* (publication of the Northwestern Pacific Railroad Historical Society," spring 2003.

15 Sonoma County Transportation Authority, *2001 Countywide Transportation Plan for Sonoma County*, adopted September 10, 2001, page 26.

Transportation – Regulatory Setting

COUNTY AND CITY REGULATIONS:

Local roads and streets are the responsibility of the applicable city or the County and improvements must meet the standards of the applicable jurisdiction and are subject to CEQA. Funding is directly from the jurisdiction's Capital Projects Plan and may be funded by the jurisdiction itself or through federal, state, or local funding programmed through the MTC and / or the SCTA.

STATE REGULATIONS:

The California Department of Transportation (Caltrans) is responsible for several highways under the State system in Sonoma County, Highways 1, 12, 37, 116, 121, and 128. Improvements to these roads must meet Caltrans standards and are subject to the California Environmental Quality Act (CEQA). Funding is also programmed through the regional Metropolitan Transportation Commission (MTC) and Sonoma County Transportation Authority (SCTA) comprised of representatives of the County and each of the nine cities.

FEDERAL REGULATIONS:

The only road in Sonoma County within the Federal Highway System is US 101. Improvements to US 101 must meet federal highway standards and are subject to the National Environmental Policy Act (NEPA). Funding for the improvements is programmed through the MTC and the SCTA.

Transportation – Thresholds of Significance

The transportation analysis uses criteria from the *State CEQA Guidelines* and the *Draft GP 2020.* The Initial Study determined that the proposed project would have potentially significant transportation and circulation impacts. The *State CEQA Guidelines* state that a project would have a significant transportation and circulation impact if it:

- Causes an increase in traffic that is substantial in relation to the existing traffic load and capacity of the street system (i.e., result in substantial increase in either the number of vehicle trips and/or the volume to capacity ratio on roads, or congestion at intersections);
- Exceeds, either individually or cumulatively, a level of service standard established by the County 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 safety 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;

- Result in inadequate parking capacity; or

- Conflict with adopted policies, plans, or programs supporting alternative transportation (e.g., bus turnouts and bicycle racks).

For this EIR, more specific significance criteria have been developed for the County's roadways. These criteria are discussed below. It should be noted that these criteria are more conservative than the congestion acceptability standards for specific projects contained in the *Draft GP 2020*. This latter standard would recognize that some roadways would operate at LOS D, E, or F in the future and that these LOS are acceptable due to a variety of circumstances.

FREEWAYS / PRIMARY ARTERIALS / OTHER ROADWAYS

For the purposes of identifying traffic impacts in this EIR, the County's level of service standard is LOS C or better (i.e., the transition between level of service C and D). For General Plan EIR purposes, LOS is measured using average midblock travel speed and type of roadway, as shown in **Exhibit 4.2-6** in the setting section. Average midblock travel speed includes time spent slowed or stopped due to congestion and due to traffic control devices, such as signals.

- If an existing freeway / primary arterial / other arterial roadway segment is currently (year 2001-2003) operating at an acceptable LOS (LOS A, B, or C) and deteriorates to an unacceptable operation (LOS D, E, or F), this impact is significant.

- If a freeway / primary arterial / other arterial roadway segment with existing traffic volumes is operating at an unacceptable LOS (D, E, or F) and there is a decrease in the calculated average travel speed of at least 1.0 miles per hour (mph) for freeways, rural arterials (including rural-suburban arterials), and other types of arterials this impact is significant.

- If the predicted future peak hour travel speed is less than 10 mph, or cannot be reliably predicted, then an increase in volume-to-capacity (v/c) ratio of more than 0.03 is significant.

TRANSIT SIGNIFICANCE CRITERIA

Transit impacts would be significant if the project:

- Induced substantial growth or concentration of population beyond the capacity of existing or planned public transit facilities;

- Increased demand for public transit service to such a degree that accepted service standards are not maintained; or

- Reduced availability of public transit to users, or interfered with existing transit users.

Transportation – Impacts and Mitigation Measures

INTRODUCTION

The Circulation and Transit Element of the *Draft GP 2020* includes a number of roadway and other circulation improvements. Project funding would come primarily from development fees and local, State and federal sources. Funding for all of the projects has not been identified.

Funds for highway capital improvements come from a variety of sources. For state highways, money is allocated through a number of formulas and programs, but the primary factor is the county's population as a share of total state population. Funds are derived principally from the sales and gallonage taxes on gasoline. The gallonage (i.e., per gallon) tax has not increased since the early 1990s, and thus has been dropping in inflation-adjusted dollars. Because the state has declared a fiscal emergency, some of the funds earmarked for transportation purposes are presently being used for other needs. For local roads, the County relies primarily on subventions from the State, which can be used for maintenance or improvements. In the past few decades, maintenance needs have meant that few road improvements could be made. On occasion, federal funds have been earmarked for local road projects (e.g., Stony Point Road improvements), but this is the exception rather than the rule.

Another source of local funding is the recently approved Measure M. In November 2004 county voters approved a one-quarter of one percent increase in the County sales tax for local transportation projects. [16] The increase in the sales tax will remain in effect for 20 years. The money will be spent on projects consistent with the approved Expenditure Plan. [17] It is expected that the sales tax will generate $470 million (in 2004 dollars) over the 20-year period. One-fifth of the money generated from this tax (estimated at $94 million) will go to maintain streets in the county and cities; the same share will go to fund safety projects and fix bottlenecks; 40 percent (estimated at $188 million) will be used for US 101 improvements; 19 percent (estimated at $89 million) will for transit, rail, bicycle and pedestrian projects; and one percent for administration.

The following circulation improvements are planned to be in place by year 2020:

- US Highway 101 – six lanes from Town of Windsor south to the Marin County line.

  High-occupancy vehicle (HOV) lanes would be added in both directions to the existing freeway, with a few of the interchanges being modified. The HOV lanes would be effective during peak commute hours, in both directions, similar to the manner they operate today on a five mile portion of the freeway in south Santa Rosa. The Sonoma County Transportation Authority has identified widening of the freeway in six discrete projects: the first, between Wilfred Avenue in Rohnert Park and Highway 12 in Santa Rosa, was opened to traffic in November 2002. The second project, from Highway 12 to north of Steele Lane in Santa Rosa, is a funded project (approximately $77.5 million) but has been delayed due to the State's current budget problems.

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16 This is known as the Measure M Traffic Relief Act for Sonoma County. Information obtained from the Supplemental Voter Information Pamphlet compiled by the Registrar of Voters.

17 *Traffic Relief Act for Sonoma County Expenditure Plan, Sonoma County Transportation Authority*, Approved June 28, 2004.

The third project, from north of Rohnert Park Expressway to Wilfred Avenue in Rohnert Park, is also funded ($47.8 million) but has likewise been delayed.

There are three unfunded projects, which are costlier than the projects listed above: from Steele Lane north to Windsor River Road in Windsor ($100 million); from Old Redwood Highway (Penngrove) to Rohnert Park Expressway ($99 million); and from Highway 37 (Novato) to Old Redwood Highway ($200 million). All costs are planning-level estimates and are subject to further refinement. [18] By borrowing against future State and federal highway tax dollars, the SCTA hopes that all projects (except the Marin-Sonoma Narrows, the last project in the list above) can be completed and opened to traffic by 2012.

- New and improved interchanges or underpasses at the following locations along US 101:

  - East Washington Street
  - Rainer Avenue or Corona Road (new)
  - Old Redwood Highway North (north Petaluma / Penngrove)
  - West Railroad Avenue (new ramp(s))
  - Wilfred Avenue
  - Hearn Avenue
  - Bellevue Avenue (new)
  - Baker Avenue
  - Mendocino / Hopper Avenue
  - River – Mark West Springs Road
  - Airport Boulevard
  - Shiloh Road
  - Arata Lane
  - Todd Road
  - Mill Street (Healdsburg)
  - Dry Creek Road
  - Fulton Road

  A new interchange is also proposed at the existing at-grade intersection of Highway 12 at Fulton Road.

- Old Redwood Highway – four lanes from Town of Windsor to the City of Santa Rosa
- Airport Boulevard – six lanes from US 101 to the Aviation Boulevard (the remaining portion of Airport Boulevard to four lanes
- Brickway extension to River Road
- Fulton Road – four lanes from Old Redwood Highway to the City of Santa Rosa
- Mark West Springs Road – three lanes where necessary from Old Redwood Highway to a point two miles east of Riebli Road
- Mark West Springs Road – four lanes from Old Redwood Highway to US 101
- River Road – four lanes from US 101 to Laughlin Road
- Highway 12

  - Four lanes from the City of Santa Rosa to Llano Road

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18 *MTC Draft Transportation 2030 Plan for the San Francisco Bay Area*, November 2004, page 120. Excludes cost of interchange improvements.

  - Three lanes from Llano Road to the City of Sebastopol
  - Three lanes from the City of Santa Rosa to Aqua Caliente Road; from Agua Caliente Road to the City of Sonoma three lanes where necessary
  - Three lanes where necessary from the City of Sebastopol to Jonive Road

- Stony Point Road – four lanes from the City of Santa Rosa to the City of Petaluma
- Santa Rosa Avenue – four lanes from Todd Road to Mountain View Road
- Highway 116 – three lanes from the City of Sebastopol to the City of Cotati
- Petaluma Hill Road – three lanes where necessary
- Re-align intersection of Petaluma Hill Road and East Railroad Avenue (soft sweeper)
- Bodway Extension four lanes from the City of Rohnert Park to East Railroad Avenue
- Railroad Avenue – three lanes where necessary from US 101 to Petaluma Hill Road
- Adobe Road – three lanes where necessary from Old Redwood Highway to Frates Road
- Old Redwood Highway – four lanes from Railroad Avenue to the City of Petaluma
- Corona Road – three lanes where necessary from Adobe Road to the City of Petaluma
- Ely Road – three lanes where necessary form Old Redwood Highway to the City of Petaluma
- Lakeville Highway – four lanes from the City of Petaluma Hill Road to Highway 37
- Highway 37 – four lanes from County line to Highway 121
- Arnold Drive – three lanes where necessary from Madrone Road to Petaluma Avenue
- Madrone Road – three lanes where necessary from Highway 12 to Arnold Drive
- Aqua Caliente Road – three lanes where necessary from Highway 12 to Arnold Drive
- Verano Avenue – three lanes where necessary from Highway 12 to Arnold Drive
- Petaluma Avenue – three lanes where necessary from the City of Sonoma to Arnold Drive

All projects on numbered state highways would require concurrence with Caltrans, although they could be funded with local funds (or a combination of state and local funds).

- Traffic calming:

  - Community of Jenner
  - Community of Bodega Bay
  - Community of Bodega
  - Community of Freestone
  - Community of Occidental
  - Community of Geyserville
  - Community of Monte Rio
  - Lower Russian River communities
  - Community of Forestville
  - Community of Graton
  - Community of Penngrove on Main Street, Petaluma Hill from Railroad Avenue to Adobe road, and Adobe Road from Old Redwood Highway to Sonoma Mountain Road
  - The entire length of Warm Springs Road
  - Community of Glen Ellen on Arnold Drive from Highway 12 to Madrone Road

Traffic calming is designed to control speed, discourage through traffic, divert, or eliminate traffic. Such measures could include (but are not limited to):

- Modern roundabouts
- Traffic chokers or chicanes
- Speed humps
- Rumble strips

- Increased enforcement
- Use of T-intersections
- Channelization or medians
- Traffic diverters
- Street closures or culs-de-sac
- Commercial vehicle prohibitions or establishing truck routes
- Turn prohibitions (part-time or full-time)

Design features can also help with traffic calming, such as reduced lane width, street trees, pedestrian warning devices, properly located signals, enforceable speed limits, signal timing, and bike lanes.

Other Improvements:

- Port Sonoma Ferry Terminal (ferry service to San Francisco)
- SMART rail system
- Transit routes per Figure CT-2 of the Circulation and Transit Element

TRAFFIC MODEL

As discussed in the setting section above, to identify potential levels of traffic impacts, a traffic analysis was performed using a computer-based traffic model. Part of the value of the model is that it allows land uses to be related to travel demand, and can predict changes that might not be immediately obvious.

Based on the results of the traffic model, roadway operations under conditions of the *Draft GP 2020* are presented in ***Appendix 7.6 Transportation***. **Exhibit 4.2-14** shows those roadways that would have a significant impact in 2020 based on adoption and implementation of the *Draft GP 2020*, assuming that all of planned improvements are constructed and that growth in the incorporated cities is consistent with their current General Plans.

The reader should note that there are several different valid methods for determining level of service, including intersection delay, average roadway traffic speed, and other criteria. The *Draft GP 2020* and this EIR have generally focused on average roadway segment speed as the most important performance measure. A segment is a section of roadway that is typically at least a mile, and sometimes several miles long. Model-forecasted traffic volumes, along with the capacity of the roadway segment, are used to predict the average travel speed along the segment, including delays associated with any traffic control (such as signals). This technique requires less data than would an intersection-by-intersection analysis, and is appropriate for analyzing a large roadway network (like Sonoma County's) over a long period of time. It is therefore widely used for countywide traffic studies. It has the disadvantage of not always identifying intersection-related delays that may not meet the County standard of D or better (i.e., less than 55 seconds of average control delay per vehicle). Intersections where less than desirable level of service are likely to occur have been identified in consultation with County Transportation and Public Works staff and are described below in the impacts section.

Exhibit 4.2-14
Significant Impacts to Roadways under the Draft GP 2020

Roadway	*Baseline LOS [a,b,c]*	*2020 LOS [b]*	*Time Period*	*Direction*
Adobe Rd				
west of Corona Rd	C	D	PM	W
east of Frates Rd	A	E	PM	E
Arnold Dr				
north of Watmaugh Rd	B	E	AM	S
north of Verano Ave	C/B	F/E	AM/PM	N/S
Guerneville Rd east of Frei Rd	A	D	AM	E
Main St (Penngrove) south of Adobe Rd	B/B	D	Both	N (AM) S (PM)
Petaluma Blvd N. north of Skillman Ln	C	E	PM	N
Petaluma Hill Rd				
north of Roberts Rd	A/D	F	Both	N
north of Snyder Ln	A/D	F	Both	N
north of Snyder Ln	B	F	PM	S
Rohnert Park Expwy east of Stony Point Rd	D	F	PM	W
Highway 12				
south of Warm Springs Rd	nd	E	AM	N
south of Pythian Rd	nd	E	AM	N
north of Agua Calienta	nd	E	AM	N
north of Boyes Blvd	nd/D	F	Both	Both
south of Verano Rd	nd/F	F	Both	Both
Highway 37				
west of Lakeville Hwy	E	F	PM	E
Between Lakeville Hwy and Hwy 121	nd/B	D	AM	Both
Between Lakeville Hwy and Hwy 121	B	E	PM	E
Highway 116				
east of Adobe Rd	nd/B	F	AM/PM	W/E
west of Stony Point Rd	nd	E	AM	E
US 101				
Between Hwy 116 and Rohnert Park Expwy	D	E	PM	N
north of Wilfred Ave	D/F	D/E	Both	Both
south of Hwy 12	F/F	D/E	AM	Both
south of River Rd	C	D	AM	N
north of Windsor River Rd	A/B	D	Both	S (AM) N (PM)
Highway 121				
south of Hwy 116	C	E	PM	S

[a] Baseline LOS is for the time period noted in the column marked Time Period.

[b] if two letters are shown, they are the AM / PM LOS (e.g., B/C means LOS B in the AM and LOS C in the PM)

[c] nd = no data (no traffic count at this location or time period)

Source: Dowling Associates, 2004

Travel within Sonoma County is affected by residential and work locations and by regional activity centers. Daily travel patterns are also influenced by work trips to and from Marin, Solano, Contra Costa, and San Francisco counties. In addition, the increasing impact of work trips to jobs located in Sonoma County and its cities, particularly Santa Rosa affects the direction of commute trips. For example, the traffic model predicts that the existing predominant southbound traffic flow in the morning (northbound in the evening) that occurs south of Rohnert Park in the US 101 corridor would begin to reverse. The predominant commute movements would be northbound in the morning and southbound in the evening commute hours. This is a result of the increasing importance of Santa Rosa as an employment center. This change is reflected in the results of the traffic model presented in ***Appendix 7.6 Transportation*** and in **Exhibit 4.2-14**.

This section of the EIR focuses on those portions of the transportation system that with the implementation of the *Draft GP 2020* would exceed the significance criteria discussed above. It is acknowledged that future land uses in the unincorporated portion of Sonoma County along with growth in the nine cities would result in increased travel demand. A general discussion of projected transportation conditions in 2020 is provided in the *Draft GP 2020*. [19] With implementation of the *Draft GP 2020* many of the existing highway conditions described in the setting section above (e.g., see **Exhibits 4.2-9** and **4.2-10**) would worsen. While land uses and development consistent with the *Draft GP 2020* would result in increases in traffic countywide in many instances this would not result in exceeding the County's acceptable level of service standards.

As discussed above, the Circulation and Transit Element of the *Draft GP 2020* includes a number of roadway and other circulation improvements. It is acknowledged that some of the improvements may not be in place by 2020. Clearly if certain circulation improvements were not completed future conditions could be worse than described in this section. It would however, be too speculative to try and forecast which improvements may not be completed. This EIR does, however, provide an analysis of future conditions if only transportation projects that are committed and substantially underway (including having environmental clearance and identified funding) were completed by 2020. This analysis is provided in the discussion of the No Project Alternative in ***Chapter 5.0 Alternatives***. **Exhibit 5.0-4** shows those roadways that would have a significant impact in 2020 based on adoption and implementation of the No Project Alternative. In short, there would be many more deficient roadway segments with the No Project Alternative than with the *Draft GP 2020*.

Impact 4.2-1 Congestion on Local County and City Roadway Segments

Land uses and development consistent with the Draft GP 2020, the cities, and implementation of proposed transportation improvements would result in unacceptable LOS along several local city and county roadways. This would be a significant impact. ***(S)***

Exhibit 4.2-14 indicates that implementation of the *Draft GP 2020* would result in unacceptable level of service on seven county roadway segments. Each of these is discussed below.

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[19] See section 2.2 (Projected Transportation Conditions in 2020) of the Circulation and Transit Element of the *Sonoma County General Plan 2020 Public Review Draft.*

Adobe Road, west of Corona Road and east of Frates Road

Land Uses and development consistent with the *Draft GP 2020* and implementation of proposed transportation improvements would result in unacceptable LOS along Adobe Road, west of Corona Road and east of Frates Road.

Exhibit 4.2-14 shows that Adobe Road west of Corona Road operates at LOS C during the PM peak hour under Baseline conditions. East of Frates Road, Adobe Road operates at LOS A during the PM peak hour under Baseline conditions. Land uses and development consistent with the *Draft GP 2020* and implementation of proposed transportation improvements would result in LOS D in the PM peak in the westbound direction along Adobe Road west of Corona Road and LOS E in the eastbound direction east of Frates Road. Roadway LOS along Adobe Road would therefore change from acceptable LOS under Baseline conditions to unacceptable LOS with the *Draft GP 2020*. This would be a significant impact.

Despite transportation improvements in parallel corridors (US 101, SMART), congestion would persist along this road segment, in part due to continued development in Petaluma, the eastside of Rohnert Park, and Solano County. Much of the existing LOS deficiency on this roadway is due to an existing all-way stop at Adobe Road and Corona Road, and due to traffic calming improvements in Penngrove.

Adobe Road is classified as a rural major collector road. Policy **CT-3h** would call for rural major collector roads to serve as routes intended to carry the internal traffic of a local area from that local road to the arterial road system and provide access to property. Policy **CT-1b** would call for focusing commute and through traffic onto US 101. Policy **CT-1f** would call for each jurisdiction to take responsibility for accommodating future traffic within its jurisdiction rather than relying upon roadways in the unincorporated areas.

While these policies would help reduce congestion on Adobe Road, they would not be sufficient to reduce traffic levels to a less-than-significant level. Additional improvements are available, such as widening to four lanes and / or additional turn lanes and signals at the intersections with Corona Road and Frates Road. However, the widening of Adobe Road to four lanes may not be feasible for several reasons, including lack of community support, lack of funding, unwanted traffic and other environmental impacts, and a desire to promote traffic calming in the downtown Penngrove community. Intersection improvements may reduce congestion to some degree, but they would have to be designed to be consistent with the desire to divert through traffic flow onto Frates Road, Lakeville Highway, and US 101.

Mitigation Measure 4.2-1(a) Revise Policy **CT-6l** of the Circulation and Transit Element (Rohnert Park / Cotati Planning Area) as follows:

> **Policy CT-6l:** Utilize the County traffic model as a foundation to prepare a detailed operational analysis of roads and streets in the Penngrove community, to identify specific traffic calming improvements within the community, and to route traffic to the Highway 101 and rail corridor. As part of this study, consider expanding the area designated for traffic calming to include the remainder of Adobe Road from Sonoma Mountain Road to Frates Road. <u>Also consider improvements to the intersections of Adobe / Corona Roads and Adobe / Frates Roads that would reduce congestion along Adobe Road where consistent with the designated road classifications.</u> Develop a phasing mechanism for these improvements that provides for completion of traffic calming improvements on designated roadways in the community prior to improvement of other roads that accommodate through traffic.

Significance After Mitigation While the recommended mitigation measure and other policies and programs of the *Draft GP 2020* would reduce these impacts related to Circulation and Transit, this would remain a significant unavoidable impact. [20] **(SU)**

Responsibility and Monitoring The Sonoma County Transportation and Public Works Department would be responsible to implement Mitigation Measure 4.2-1(a). The Board of Supervisors would be responsible for adopting the revised policy as part of the *GP 2020*.

Arnold Drive north of Watmaugh Road and north of Verano Avenue

Land uses and development consistent with the *Draft GP 2020* and implementation of proposed transportation improvements would result in unacceptable LOS along Arnold Drive north of Watmaugh Road and north of Verano Avenue.

Exhibit 4.2-14 shows that Arnold Drive north of Watmaugh Road currently operates at LOS B during the AM peak hour southbound under Baseline conditions. North of Verano, it is LOS C in the AM peak hour northbound and LOS B in the PM peak southbound. Land uses and development consistent with the *Draft GP 2020* and implementation of proposed transportation improvements would result in LOS E in the AM peak in the southbound direction along this roadway. North of Verano Avenue, it would operate at LOS F in the AM peak in the northbound direction, and LOS E in the PM peak in the southbound direction. Roadway LOS along Arnold Drive would therefore change from acceptable LOS under Baseline conditions to unacceptable LOS with the *Draft GP 2020*. This would be a significant impact.

Verano Avenue carries high traffic volumes over long distances in the Sonoma Valley. It is one of only two routes (along with Highway 12) to do so. Congestion would persist or worsen along this road segment, in part due to continued development in Sonoma Valley and Solano County.

Arnold Drive is classified as an urban principal arterial between Petaluma Avenue and Madrone Road, and a rural principal arterial between Highway 116 and Petaluma Avenue. Policy **CT-3g** would call for urban and rural principal arterials to carry large volumes of intercity traffic and place priority of the flow of traffic rather than on access to property.

While these policies would help reduce congestion on Arnold Drive, they would not be sufficient to reduce traffic levels to a less-than-significant level. Additional improvements are available, such as widening to four lanes and / or additional turn lanes and signals at various intersections. However, the widening of Arnold Drive to four lanes may not be feasible for several reasons, including lack of community support, lack of funding, unwanted traffic and other environmental impacts, and right-of-way constraints.

Mitigation Measure 4.2-1(b) Add a new policy to the Circulation and Transit Element (Sonoma Valley Planning Area) as follows:

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[20] It would be the responsibly of County of Sonoma decision-makers (Planning Commission and Board of Supervisors) to determine if a specific mitigation measure is not feasible. To determine that the mitigation is not feasible the decision makers would need to make a finding that "specific economic, legal, social, technological or other considerations, including considerations for the provision of employment opportunities for highly trained workers, make infeasible the mitigation". See State CEQA Guidelines section 15091(a)(3).

> **Policy CT-6xx**: Consider intersection improvements such as signalization and left turn lanes at various intersections along Arnold Drive to reduce congestion, provided that the improvements are consistent with the designated road classifications.

Significance After Mitigation While the recommended mitigation measure and other policies and programs of the *Draft GP 2020* would reduce these impacts related to Circulation and Transit to some degree, this would remain a significant unavoidable impact. (**SU**)

Responsibility and Monitoring The Sonoma County Transportation and Public Works Department would be responsible for implementing Mitigation Measure 4.2-1(b) based on traffic engineering studies. The Board of Supervisors would be responsible for adopting the policy as part of the *GP 2020*.

Guerneville Road, east of Frei Road

Land uses and development consistent with the *Draft GP 2020* and implementation of proposed transportation improvements would result in unacceptable LOS along Guerneville Road, east of Frei Road.

Exhibit 4.2-14 shows that Guerneville Road operates at LOS A during the AM peak hour under Baseline conditions, and at LOS D with land uses and development consistent with the *Draft GP 2020*. Land uses and development consistent with the *Draft GP 2020* and implementation of proposed transportation improvements would result in LOS D in the AM peak in the eastbound direction along Guerneville Road east of Frei Road. Roadway LOS along this portion of Guerneville Road would therefore change from acceptable LOS under Baseline conditions to unacceptable LOS with the *Draft GP 2020*. This would be a significant impact.

Despite transportation improvements in parallel corridors (such as Highway 12), congestion would persist along this road segment, in part due to continuing jobs growth in Santa Rosa that would affect this important commuter route.

Guerneville Road is classified as a rural principal arterial. Policy **CT-3g** would call for urban and rural principal arterials to carry large volumes of intercity traffic and place priority of the flow of traffic rather than on access to property.

While these policies would help reduce congestion on Guerneville Road, they would not be sufficient to reduce traffic levels to a less-than-significant level. Additional improvements are available, such as widening to four lanes and / or increased access management. However, the widening of Guerneville Road to four lanes may not be feasible for several reasons, including lack of community support, lack of funding, unwanted traffic and other environmental impacts, and right-of-way constraints.

Mitigation Measure 4.2-1(c) Add a new policy to the Circulation and Transit Element (Russian River Planning Area) as follows:

> **Policy CT-6yy**: Consider increased access management along Guerneville Road between Highway 116 and the Santa Rosa city limits to preserve through-traffic carrying capacity, provided that the improvements are consistent with the designated road classifications.

Significance After Mitigation While the recommended mitigation measure and other policies and programs of the *Draft GP 2020* would reduce these impacts related to Circulation and Transit by some degree, this would remain a significant unavoidable impact. (**SU**)

Responsibility and Monitoring The Sonoma County Transportation and Public Works Department would be responsible for implementing improvements and PRMD would be responsible for site plan and policies to address access management. The Board of Supervisors would be responsible for adopting the policy as part of the *GP 2020*.

Main Street between Old Redwood Highway and Adobe Road, through the community of Penngrove

Land uses and development consistent with the *Draft GP 2020* and implementation of proposed transportation improvements would result in unacceptable LOS along Main Street in Penngrove.

Exhibit 4.2-14 shows that Main Street south of Adobe Road operates at LOS B northbound during AM peak and southbound during the PM peak - currently the "reverse peak" under Baseline conditions. Land uses and development consistent with the *Draft GP 2020* and implementation of proposed transportation improvements would result in LOS D in both the AM and PM peaks (northbound in the morning and southbound in the evening). Roadway LOS along Main Street would therefore change from acceptable LOS under Baseline conditions to unacceptable LOS with the *Draft GP 2020*. This would be a significant impact.

Despite transportation improvements in parallel corridors (US 101, SMART), congestion would persist along this road, in part due to continued development in Petaluma, the eastside of Rohnert Park, and Santa Rosa. Job growth causes the current reverse of peak direction flow to increase to the point where it equals, or exceeds, the current traffic volumes under the Baseline.

Main Street is classified as a rural major collector road. Policy **CT-3h** would call for rural major collector roads to serve as routes intended to carry the internal traffic of a local area from that local road to the arterial road system and provide access to property. Policy **CT-1b** would call for focusing commute and through traffic onto US 101. Policy **CT-1f** would call for each jurisdiction to take responsibility for accommodating future traffic within its jurisdiction rather than relying upon roadways in the unincorporated areas. Policy **CT-6l** would call for using the County Traffic Model as a foundation for preparing a detailed operating analysis of roads in the Penngrove community. Policy **CT-6m** would request the cooperation of Santa Rosa, Cotati, and Petaluma in funding traffic calming and capacity improvements in this area. Policy **CT-6n** would call for considering traffic calming measures on local streets in Penngrove. Policy **CT-6o** would call for evaluating the feasibility of closure of Petaluma Hill Road and diversion of traffic from the Petaluma Hill Road corridor near Railroad Avenue to US 101.

While these policies would help reduce congestion on Main Street, they would not be sufficient to reduce traffic levels to a less-than-significant level. Additional improvements are available, such as constructing a bypass around Penngrove, widening Main Street to four lanes, and / or turning lane intersection improvements and signal modifications. However, these improvements may not be feasible for several reasons, including lack of community support, lack of funding, and unwanted traffic and other environmental impacts. Traffic calming measures are included in the *Draft GP 2020* Circulation and Transit Element.

Mitigation Measure 4.2-1(d) No Mitigation available beyond the *Draft GP 2020* policies discussed in the impact analysis above.

Significance After Mitigation While the policies and programs of the *Draft GP 2020* would reduce these impacts related to Circulation and Transit by some degree, this would remain a significant unavoidable impact. (**SU**)

Petaluma Boulevard north of Skillman Lane

Land uses and development consistent with the *Draft GP 2020* and implementation of proposed transportation improvements would result in unacceptable LOS along Petaluma Boulevard North, north of Skillman Lane. This would be a significant impact.

Exhibit 4.2-14 shows that Petaluma Boulevard north of Skillman Lane operates at LOS C northbound during the PM peak under Baseline conditions. Land uses and development consistent with the *Draft GP 2020* and implementation of proposed transportation improvements would result in LOS E in the PM peak (northbound in the evening). Roadway LOS on Petaluma Boulevard would therefore change from acceptable LOS under Baseline conditions to unacceptable LOS with the *Draft GP 2020*. This would be a significant impact.

Despite transportation improvements in parallel corridors (US 101, SMART), congestion would persist along this road segment, in part due to continued development in Petaluma and continued congestion on US 101 despite widening.

Petaluma Boulevard North is classified as an urban principal arterial. Policy **CT-1b** would call for focusing commute and through traffic onto US 101. Policy **CT-1f** would call for each jurisdiction to take responsibility for accommodating future traffic within its jurisdiction rather than relying upon roadways in the unincorporated areas. Policy **CT-6s** would seek collaboration with the City of Petaluma in establishing a traffic and circulation plan to ameliorate the adverse impact of county and city traffic on rural roads in the county area adjacent to the city.

While these policies would help reduce congestion on Petaluma Boulevard North, they would not be sufficient to reduce traffic levels to a less-than-significant level. Additional improvements are available, such as signalization, turning lanes and pockets, and access management.

Mitigation Measure 4.2-1(e) Recommended mitigation would include signalization and turning lane intersection improvements, lengthening turning pockets, access management, and signal modifications.

Significance After Mitigation Intersection improvements would aid in mitigating traffic impacts, but would be unlikely to reduce the impact to the roadway to a less-than-significant level (i.e., return the roadway to an acceptable LOS under the *Draft GP 2020*). This would be a significant unavoidable impact. (**SU**)

Responsibility and Monitoring The Sonoma County Transportation and Public Works Department in consultation with the City of Petaluma (area is within city sphere of influence) would be responsible to implement the improvements.

Petaluma Hill Road from Adobe Road to the Santa Rosa City Limits

Land uses and development consistent with the *Draft GP 2020* and implementation of proposed transportation improvements would result in unacceptable LOS along Petaluma Hill Road from Adobe Road to the Santa Rosa city limits.

Exhibit 4.2-14 shows that Petaluma Hill Road operations vary, but are generally LOS A or B in the AM, and LOS D in the PM. Land uses and development consistent with the *Draft GP 2020* and implementation of proposed transportation improvements would result in LOS F along several roadway segments between East Railroad Avenue and north of Snyder Lane. This congestion would

affect both the AM and PM peaks. Congestion is generally more prevalent in the northbound direction, but would also occur in the southbound direction north of Snyder Lane. Certain portions of Petaluma Hill Road operating at an acceptable LOS under Baseline conditions therefore would change to an unacceptable LOS with the *Draft GP 2020*. ***Appendix 7.6 Transportation*** indicates that other portions of Petaluma Hill Road operating at an unacceptable LOS under Baseline conditions would have a decrease in the average travel speed of at least 1.0 mile per hour with the *Draft GP 2020*. These would be significant impacts.

Despite transportation improvements in parallel corridors (US 101, SMART), congestion would persist along this road segment, in part due to continued development in Petaluma, the eastside of Rohnert Park, and Santa Rosa. Job growth causes the current reverse of peak direction flow to increase to the point where it equals, or exceeds, the current traffic volumes under the Baseline.

Petaluma Hill Road is classified as a rural major collector road from Adobe Road (Main Street) to East Railroad Avenue. Policy **CT-3h** would call for rural major collector roads to serve as routes intended to carry the internal traffic of a local area from that local road to the arterial road system and provide access to property. From East Railroad Avenue to the Santa Rosa city limits, it is classified as a rural minor arterial. Policy **CT-3g** would call for urban and rural principal arterials to carry large volumes of intercity traffic and place priority of the flow of traffic rather than on access to property. Policy **CT-1b** would call for focusing commute and through traffic onto US 101. Policy **CT-1f** would call for each jurisdiction to take responsibility for accommodating future traffic within its jurisdiction rather than relying upon roadways in the unincorporated areas.

Policy **CT-6l** would call for using the County Traffic Model as a foundation for preparing a detailed operating analysis of roads in the Penngrove community. Policy **CT-6m** would request the cooperation of Santa Rosa, Cotati, and Petaluma in funding traffic calming and capacity improvements in this area. Policy **CT-6n** would call for considering traffic calming measures on local streets in Penngrove. Policy **CT-6o** would call for evaluating the feasibility of closure of Petaluma Hill Road and diversion of traffic from the Petaluma Hill Road corridor near Railroad Avenue to US 101.

While these policies would help reduce congestion on Petaluma Hill Road, they would not be sufficient to reduce traffic levels to a less-than-significant level. Additional improvements are available, such as, widening Petaluma Hill Road to four lanes, intersection improvements and restrictions, turning lanes, and signals. However, these improvements may not be feasible for several reasons, including lack of community support, lack of funding, and unwanted traffic and other environmental impacts.

Mitigation Measure 4.2-1(f) Add a new policy to the Circulation and Transit Element (Rohnert Park/Cotati Planning Area) as follows:

> **Policy CT-6zz**: Consider intersection improvements and restrictions, turning lanes, and signalization along Petaluma Hill Road to reduce congestion, provided that the improvements are consistent with the designated road classifications.

Significance After Mitigation While the recommended mitigation measure and other policies and programs of the *Draft GP 2020* would reduce these impacts to some degree, this would remain a significant unavoidable impact. (**SU**)

Responsibility and Monitoring The Sonoma County Transportation and Public Works Department would be responsible to implement the improvements. The Board of Supervisors would be responsible for adopting the policy as part of the *GP 2020*.

Rohnert Park Expressway from Stony Point Road to the Rohnert Park City Limits

Land uses and development consistent with the *Draft GP 2020* and implementation of proposed transportation improvements would result in unacceptable LOS along Rohnert Park Expressway from Stony Point Road to the Rohnert Park city limits. This would be a significant impact.

Exhibit 4.2-14 shows that the existing Baseline LOS on this two-lane roadway is D. Land uses and development consistent with the *Draft GP 2020* and implementation of proposed transportation improvements would result in LOS F in the PM peak in the westbound direction. ***Appendix 7.6 Transportation*** indicates that this portion of Rohnert Park Expressway operating at an unacceptable LOS under Baseline conditions would have a decrease in the average travel speed of at least 1.0 mile per hour with the *Draft GP 2020*. This would be a significant impact.

Traffic growth occurs as a result of development in the area (including the proposed Federated Indians of Graton Rancheria casino complex), and due to widening of Stony Point Road.

Rohnert Park Expressway outside city limits is classified as a rural minor arterial. Policy **CT-3g** would call for urban and rural minor arterials to carry large volumes of intercity traffic and place priority of the flow of traffic rather than on access to property. Policy **CT-6o** would call for working with the City of Rohnert Park to enhance east/west traffic flow through these cities to US 101 and the SMART rail corridor. Policy **CT-1f** would call for each jurisdiction to take responsibility for accommodating future traffic within its jurisdiction rather than relying upon roadways in the unincorporated areas.

While these policies would help reduce congestion on Rohnert Park Expressway west of the city limits, they would not be sufficient to reduce traffic levels to a less-than-significant level. Additional improvements are available, such as widening Rohnert Park Expressway to four lanes and additional turning lanes at Stony Point Road. However, the widening of the Expressway to four lanes may not be feasible for several reasons, including lack of community support and lack of funding. Negotiations are currently underway concerning appropriate improvements to be paid for if the proposed casino is built, which could provide for funding. However, this funding is not certain.

Mitigation Measure 4.2-1(g) Add a new policy to the Circulation and Transit Element (Rohnert Park/Cotati Planning Area) as follows:

> **Policy CT-6aaa**: Consider additional turning lanes at the intersection of Rohnert Park Expressway and Stony Point Road to reduce congestion on the Rohnert Park Expressway.

Significance After Mitigation While the recommended mitigation measure and other policies and programs of the *Draft GP 2020* would reduce these impacts by some degree, this would remain a significant unavoidable impact. **(SU)**

Responsibility and Monitoring The Sonoma County Transportation and Public Works Department in consultation with City of Rohnert Park (roadway is within Rohnert Park sphere of influence) would be responsible to implement the improvements. The Board of Supervisors would be responsible for adopting the policy as part of the *GP 2020*.

Traffic in the Cities

Traffic congestion within the cities of Sonoma County would result from the combination of land uses and development consistent with *Draft GP 2020* and the General Plans of the cities. The major

roadways within the cities that would experience severe congestion on one or more segments (LOS E or F) are listed below:

Cloverdale: Cloverdale Blvd.

Healdsburg: Healdsburg Avenue near US 101 interchanges.

Windsor: Old Redwood Highway west of US101, Starr Road.

Santa Rosa: South Santa Rosa Avenue, Farmers Lane, Dutton Road near Highway 12, Stony Point / Marlow Road corridor, College Avenue near US 101, Fountaingrove Parkway, Bicentennial Drive, Santa Rosa Avenue, Fulton Road, and Cleveland Avenue.

Rohnert Park: Snyder Lane, Rohnert Park Expressway, Commerce Boulevard, Southwest Boulevard., and Golf Course Drive.

Cotati: Old Redwood Highway, East Cotati Avenue, and West Sierra Avenue.

Sebastopol: Highway 12, Gravenstein Highway, Ragle Road, Pleasant Hill Road.

Petaluma: Lakeville Highway, Magnolia Street, Skillman Lane, Petaluma Boulevard North, Frates Rd, East Washington, and Old Redwood Highway.

Sonoma: Highway 12, Spain Street, and Third Street West.

Without additional study, it is not possible to determine the extent to which the future congestion of city and county roadways would be the result of future land use and development within one jurisdiction or another. In recognition of this, the *Draft GP 2020* includes Section 6 "Goals, Objectives, and Policies for Phasing and Funding of Improvements" of the Circulation and Transit Element. This section sets forth a goal, objectives, and policies which would provide for joint City and County funding of future improvements based upon the appropriate "fair share" contributions of each jurisdiction. Without such studies, policies and programs, as well as the cooperation of the cities, it is not feasible for the County to mitigate traffic congestion within city limits.

Mitigation Measure 4.2-1(h) No additional mitigation is available.

Significance After Mitigation This would be a significant unavoidable impact. (**SU**)

Impact 4.2-2 Congestion on State Highways

*Land uses and development consistent with the Draft GP 2020 and implementation of proposed transportation improvements would result in unacceptable LOS along several locations on State Highways. This would be a significant impact. **(S)***

Exhibit 4.2-14 indicates that implementation of the *Draft GP 2020* would result in unacceptable level of service along several locations on State Highways in Sonoma County. Each of these is discussed below.

Highway 12 in Several Locations, Primarily in the Sonoma Valley.

Land uses and development consistent with the *Draft GP 2020* and implementation of proposed transportation improvements would result in unacceptable LOS along several locations of Highway 12.

Exhibit 4.2-14 shows that the existing Baseline LOS on this two-lane road varies from D to F. Land uses and development consistent with the *Draft GP 2020* and implementation of proposed transportation improvements would result in the AM peak northbound, from north of Agua Caliente Road to south of Pythian Road to be LOS E; from north of Boyes Boulevard to south of Verano Road would be LOS F in both directions and both weekday peak periods. ***Appendix 7.6 Transportation*** indicates that portions of Highway 12 operating at an unacceptable LOS under Baseline conditions would have a decrease in the average travel speed of at least 1.0 mile per hour with the *Draft GP 2020*. This would be a significant impact.

Traffic growth occurs as a result of development in the Sonoma Valley, Santa Rosa, and Solano County, including special generator and tourism oriented traffic; to a lesser degree, it also would occur as a result of continued congestion in the US 101 corridor.

Highway 12 is classified as a rural principal arterial from the Santa Rosa city limits south (east) to Agua Caliente Road, and an urban principal arterial from Agua Caliente Road to the Sonoma town limits. Policy **CT-3g** would call for urban and rural principal arterials to carry large volumes of intercity traffic and place priority on the flow of traffic rather than on access to property. Policy **CT-6u** would require the development of parcels fronting Highway 12 between Sonoma and West Thomsen Avenue to dedicate right-of-way for planned improvements under certain conditions. Policy **CT-6w** would call for continuing utilization of the "Traffic Sensitive" designation and zoning district to reduce project traffic impacts on Highway 12. Policy **CT-6x** would call for considering cumulative weekend traffic impacts in the review of discretionary projects throughout the Sonoma Valley Planning Area. Policy **CT-6y** would call for coordinating with the City of Sonoma to improve and maintain Highway 12 as the east/west route connecting the City of Santa Rosa and Sonoma Valley.

While these policies would help reduce congestion on Highway 12, they would not be sufficient to reduce traffic levels to a less-than-significant level. Additional improvements are available, such as widening to four lanes in some segments and / or signalization, turning lanes, passing lanes, and other traffic management. However, the widening of Highway 12 to four lanes may not be feasible for several reasons, including lack of community support, lack of funding, unwanted traffic and other environmental impacts, and right-of-way constraints. In addition, improvements require the approval of Caltrans and are not within the jurisdiction of Sonoma County.

Mitigation Measure 4.2-2 (a) Add a new policy to the Circulation and Transit Element (Russian River, Santa Rosa, and Sonoma Valley Planning Areas) as follows:

> **Policy CT-6bbb**: Work with Caltrans in considering signalization, turning lanes, passing lanes, and other traffic management improvements along Highway 12 to reduce congestion, provided that the improvements are consistent with the designated road classifications.

Significance After Mitigation While the recommended mitigation measure and other policies and programs of the *Draft GP 2020* would reduce these impacts by some degree, this would remain a significant unavoidable impact. (**SU**)

Responsibility and Monitoring Caltrans, in cooperation with Sonoma County Transportation and Public Works Department and PRMD would be responsible to implement these improvements. The Board of Supervisors would be responsible for adopting the policy as part of the *GP 2020*.

Highway 37 in Several Locations.

Land uses and development consistent with the *Draft GP 2020* and implementation of proposed transportation improvements would result in unacceptable LOS along portions of Highway 37.

Exhibit 4.2-14 shows that the existing Baseline LOS on Highway 37 is LOS E west of Lakeville Highway, and, where data are available, LOS B between Lakeville Highway and Highway 121. With land uses and development consistent with the *Draft GP 2020* and implementation of proposed transportation improvements the PM peak eastbound, west of Lakeville Highway would be LOS E; between Lakeville Highway and Highway 121 would be LOS D in the AM peak (in both directions), and LOS E in the PM in the eastbound direction. Therefore certain portions of Highway 37 operating at an acceptable LOS under Baseline conditions would change to an unacceptable LOS with the *Draft GP 2020*. ***Appendix 7.6 Transportation*** indicates that other portions of Highway 37 operating at an unacceptable LOS under Baseline conditions would have a decrease in the average travel speed of at least 1.0 mile per hour with the *Draft GP 2020*. These would be significant impacts.

Traffic growth occurs as a result of development in the Sonoma Valley and Solano County, including special generator and tourism-oriented traffic, and through traffic between the North Bay and Sacramento. A large percentage of traffic on this route (which is 6.1 miles long within Sonoma County) is through traffic (i.e., has neither an origin nor destination in Sonoma County).

Highway 37 is classified as a rural principal arterial in its entirety from the Marin to the Solano County line. It is a divided expressway from the Marin County line to Highway 121, where the *Draft GP 2020* would provide for widening to four lanes to the Solano County line (at the Petaluma River Bridge). Policy **CT-3g** would call for urban and rural minor arterials to carry large volumes of intercity traffic and to place priority of the flow of traffic rather than on access to property.

Widening Highway 37 to four through lanes is included in the Circulation and Transit Element proposed transportation network to mitigate impacts.

While these policies would help reduce congestion on Highway 37, they would not be sufficient to reduce traffic levels to a less-than-significant level. Additional improvements are available, such as grade separation structures at Lakeville Highway and Highway 121, turning lanes, access control, and other traffic management. However, the grade separation structures may not be feasible for several reasons, including the considerable expense and lack of funding and other environmental impacts such as wetlands. In addition, improvements require the approval of Caltrans and are not within the jurisdiction of Sonoma County.

Mitigation Measure 4.2-2(b) Add a new policy to the Circulation and Transit Element (Petaluma and Sonoma Valley Planning Areas) as follows:

> **Policy CT-6ccc**: Work with Caltrans in considering turning lanes, access controls, and other traffic management improvements along Highway 37 to reduce congestion, provided that the improvements are consistent with the designated road classifications.

Significance After Mitigation While the recommended mitigation measure and other policies and programs of the *Draft GP 2020* would reduce these impacts by some degree, this would remain a significant unavoidable impact. (**SU**)

Responsibility and Monitoring Caltrans, in coordination with Sonoma County PRMD would be responsible to implement these improvements. The Board of Supervisors would be responsible for adopting the policy as part of the *GP 2020*.

Highway 116 east of Adobe Road (Petaluma Planning Area) and west of Stony Point Road (Rohnert Park – Cotati Planning Area).

Land uses and development consistent with the *Draft GP 2020* and implementation of proposed transportation improvements would result in unacceptable LOS along portions of Highway 116.This would be a significant impact.

Exhibit 4.2-14 shows that the existing Baseline LOS is LOS B in the PM east of Adobe Road (no data are available in the AM peak). West of Stony Point Road, the Baseline LOS is not available. Land uses and development consistent with the *Draft GP 2020* and implementation of proposed transportation improvements would result in LOS F in the AM westbound, and PM eastbound. West of Stony Point Road, LOS E would occur in the AM peak eastbound. Roadway LOS on Highway 116 would change from acceptable LOS under Baseline conditions to unacceptable LOS with the *Draft GP 2020*. This would be a significant impact.

Traffic growth occurs as a result of continuing congestion on US 101, growth in western Sonoma and Solano County.

Highway 116 is classified as a rural principal arterial in its entirety from its junction with Highway 1 near Jenner to the southern Sonoma Valley. It is a two-lane road in nearly its entirety, although there are passing lanes between Sebastopol and Cotati, and a short section of four lanes in west Cotati near US 101. Policy **CT-3g** would call for urban and rural minor arterials to carry large volumes of intercity traffic and place priority on the flow of traffic rather than on access to property.

While these policies would help reduce congestion on Highway 116, they would not be sufficient to reduce traffic levels to a less-than-significant level. Additional improvements are available, such as widening Highway 116 to four lanes, or passing lanes and turning lanes. However, widening Highway 116 may not be feasible for several reasons, including the lack of community support, lack of funding, unwanted traffic, and other environmental impacts. In addition, improvements require the approval of Caltrans and are not within the jurisdiction of Sonoma County.

Mitigation Measure 4.2-2(c) Add a new policy to the Circulation and Transit Element (Sebastopol, Russian River, Santa Rosa, Petaluma and Sonoma Valley Planning Areas) as follows:

> **Policy CT-6ddd**: Work with Caltrans in considering passing and turning lanes along Highway 116 to reduce congestion, provided that the improvements are consistent with the designated road classifications.

Significance After Mitigation While the recommended mitigation measure and other policies and programs of the *Draft GP 2020* would reduce these impacts by some degree, this would remain a significant unavoidable impact. (**SU**)

Responsibility and Monitoring Caltrans would be responsible to implement these improvements. The Board of Supervisors would be responsible for adopting the policy as part of the *GP 2020*.

Highway 121 south of Highway 116 in the southern Sonoma Valley.

Land uses and development consistent with the *Draft GP 2020* and implementation of proposed transportation improvements would result in unacceptable LOS along a portion of Highway 121. This would be a significant impact.

Exhibit 4.2-14 shows that the existing Baseline LOS is LOS C in the PM peak at this location. Traffic growth occurs as a result of development in Sonoma Valley and Solano County. Land uses and development consistent with the *Draft GP 2020* and implementation of proposed transportation improvements would result in LOS E in the PM peak southbound direction on this portion of Highway 121. Roadway LOS there would change from acceptable LOS under Baseline conditions to unacceptable LOS with the *Draft GP 2020*. This would be a significant impact.

Highway 121 is classified as a rural principal arterial in its entirety from its junction with Highway 37 to through its junction with Highway 116 near Schellville to the Napa County line. This highway carries a large amount of through traffic (neither an origin nor destination in Sonoma County), and is highly affected by growth in tourism (it is aptly named the Carneros Highway for the world-renowned wine producing region through which it runs), and special events (e.g., Infineon Raceway, wineries). Except for passing lanes near the Napa/Sonoma County line, Highway 121 is two lanes along its entirety. Policy **CT-3g** would call for urban and rural minor arterials to carry large volumes of intercity traffic and place priority of the flow of traffic rather than on access to property.

While these policies would help reduce congestion on Highway 121, they would not be sufficient to reduce traffic levels to a less-than-significant level. Additional improvements are available, such as widening Highway 121 to four lanes in some segments, intersection improvements at the intersection of Highways 116 and 121, and passing lanes and access management. However, the widening of Highway 121 to four lanes may not be feasible for several reasons, including lack of community support, lack of funding, unwanted traffic, and other environmental impacts. In addition, improvements require the approval of Caltrans and are not within the jurisdiction of Sonoma County.

Mitigation Measure 4.2-2(d) Add a new policy to the Circulation and Transit Element (Sonoma Valley Planning Area) as follows:

> **Policy CT-6eee**: Work with Caltrans in considering intersection improvements at Highways 116 and 121 and passing lanes, and access management along Highway 121 to reduce congestion, provided that the improvements are consistent with the designated road classifications.

Significance After Mitigation While the recommended mitigation measure and other policies and programs of the *Draft GP 2020* would reduce these impacts to some degree, this would remain a significant unavoidable impact. (**SU**)

Responsibility and Monitoring Caltrans, in cooperation with Sonoma County PRMD for access management and land use issues would be responsible to implement these improvements. The Board of Supervisors would be responsible for adopting the policy as part of the *GP 2020*.

Impact 4.2-3 Congestion on Portions of US 101 in Several Areas between Cotati to north of Windsor

Land uses and development consistent with the Draft GP 2020 and implementation of proposed transportation improvements would result in unacceptable LOS along portions of US 101. This would be a significant impact. ***(S)***

US 101 carries nearly one-third of all vehicle-miles traveled in Sonoma County on a weekday. **Exhibit 4.2-14** shows that the existing Baseline LOS for portions of US 101 as follows:

- LOS D, Highway 116 (Cotati) to Rohnert Park Expressway (PM northbound direction)
- LOS D/F north of Wilfred Avenue (AM and PM in northbound and southbound direction)
- LOS F south of Highway 12 (AM in northbound and southbound direction)
- LOS C south of River Road (AM in northbound direction)
- LOS A southbound AM, and B northbound PM, north of Windsor River Road

Note these service levels reflect conditions in 2000-2001, prior to the widening of US 101 between Wilfred Avenue (Rohnert Park) and Highway 12 (Santa Rosa). Also, backups from other downstream bottlenecks may cause the LOS south of River Road to be F at certain times under existing conditions.

Land uses and development consistent with the *Draft GP 2020* and implementation of proposed transportation improvements would result in LOS D or E on portions of US 101. These include:

- Between Highway 116 (Cotati) and the Rohnert Park Expressway (LOS E in the PM northbound)
- North of Wilfred Avenue, in both directions and both peaks, LOS D or E
- South of Highway 12, LOS D northbound and LOS E southbound, in the AM peak
- South of River Road, LOS D in the AM northbound (travel toward the Airport Industrial area)
- North of Windsor River Road, southbound in the AM and northbound in the PM (no widening proposed in this area)

Portions of US 101 north of Santa Rosa operating at an acceptable LOS under Baseline conditions would change to an unacceptable LOS with the *Draft GP 2020*. ***Appendix 7.6 Transportation*** indicates that portions of US 101 south of Santa Rosa operating at an unacceptable LOS under Baseline conditions would have a decrease in the average travel speed of at least 1.0 mile per hour with the *Draft GP 2020*. These would be significant impacts.

Traffic congestion persists despite widening US 101, because the increase in trips generated by new development exceed the new capacity provided (the lanes would be reserved for high occupancy vehicles, so effectively increase capacity during peak hours by 20 to 30 percent, which is less than the growth in trips between 2000 and 2020).

US 101 is classified as a freeway in its entirety from the Marin County to the Mendocino County line. Policy **CT-3f** would call for the designation and design of freeways, in conjunction with SCTA and Caltrans, as limited access highways that carry large volumes of interurban, regional, and interstate traffic, and carry local traffic in urban areas. Furthermore, planned additional travel lanes should allow for HOV and transit use during peak commute periods.

While these policies would help reduce congestion on US 101, they would not be sufficient to reduce traffic levels to a less-than-significant level. Additional improvements are available, such as widening US 101 to eight lanes in some segments, and / or to implement management actions such as ramp metering, auxiliary lanes, the Bay Area Traffic Operations System (TOS), and the Freeway Service Patrol. Policies of the *Draft GP 2020* to increase transit and TDM would also help reduce congestion.

However, the widening of US 101 to eight lanes may not be feasible for several reasons, including lack of community support, lack of funding, unwanted traffic, right-of-way constraints, limited space at overpasses, and other environmental impacts. In addition, improvements require the approval of Caltrans and are not within the jurisdiction of Sonoma County.

Mitigation Measure 4.2-3(a) Revise Policy CT-3f of the Circulation and Transit Element as follows:

> **Policy CT-3f**: In conjunction with SCTA and Caltrans, designate and design freeways as limited access highways that carry large volumes of interurban, regional, and interstate traffic, and carry local traffic in urban areas. The following policies apply to designated freeways:
>
> Sub policy items 1-4 do not change
>
> (5) Consider additional traffic management actions such as ramp metering, auxiliary lanes, the Bay Area Traffic Operations System, and the Freeway Service Patrol.

Significance After Mitigation While the recommended mitigation measure and other policies and programs of the *Draft GP 2020* would reduce these impacts by some degree, this would remain a significant unavoidable impact. (**SU**)

Responsibility and Monitoring Caltrans, with the Metropolitan Transportation Commission, the Sonoma County Transportation Authority, and PRMD would be responsible to implement the improvements. For transit services, Golden Gate Transit and Sonoma County Transit would be responsible for bus services, and the SMART District for possible rail transit services. The Board of Supervisors would be responsible for adopting the revised policy as part of the *GP 2020*.

Impact 4.2-4 Congestion at Key Intersections throughout the County

Land uses and development consistent with the Draft GP 2020 and implementation of proposed transportation improvements would result in unacceptable LOS at several key intersections. This would be a significant impact. ***(S)***

Traffic modeling conducted for this EIR determined that congestion on county roadway segments would increase significantly as a result of future land uses and development in the unincorporated county and the cities. These impacts are discussed in detail earlier in this section. While the traffic model did not identify specific LOS for intersections, the model's data combined with projections by County Transportation and Public Works Department staff, identified key intersections in the unincorporated area that would most likely experience significant congestion (LOS D or worse). These intersections are:

In the Santa Rosa Planning Area:

- Sebastopol Road and West Avenue (PM)
- Stony Point Road at Todd Road (PM)

In the Rohnert Park / Cotati Planning Area (Penngrove):

- Adobe Road at Petaluma Hill Road (AM and PM)

In the Petaluma Planning Area:

- Adobe Road at Frates Road (AM)
- Adobe Road at Corona Road (PM)

In the Sonoma Valley Planning Area:

- Napa Road at 8th Street East (PM)
- Highway 121 at Highway 116 (PM)

In addition to these key intersections, significant congestion would also be likely at many other intersections in the unincorporated area. For example, intersection traffic would also likely be congested along the roadways identified as LOS D or worse under *Impact 4.2-1 Congestion on County Roadway Segments*. Detailed intersection impacts are best quantified during the review of project traffic analyses.

The *Draft GP 2020* contains a number of objectives and policies that would reduce congestion at intersections. Objective **CT-3.2** would call for maintaining the level of service at LOS D or better at roadway intersections. Objective **CT-3.3** would allow a lower LOS to be acceptable if warranted by local environmental or community values, or by an overriding public benefit. Objective **CT-5.3** would call for the use of appropriate funding strategies for maintenance of acceptable LOS. These objectives would be implemented by several policies. Policy **CT-3a** would establish the appropriate standard for service acceptability. Policies **CT-5e** and **CT-5f** would establish funding and mitigation requirements for land uses and development projects that impact the LOS levels. However, new land uses and development in the county unincorporated area would be responsible only for their fair share of congestion impacts. Much of the congestion will continue to be the result of existing land uses and future development within the cities. Therefore, these objectives and policies would not reduce intersection congestion to a less-than-significant level.

In light of the likelihood of significant congestion at intersections and the uncertainty about the specific levels of congestion at each intersection, this would be a significant impact. The following mitigation would therefore be required.

Mitigation Measure 4.2-4(a) Mitigation measures may include changing the timing of the signal controller; adding or modifying signal phases; and / or re-striping, lengthening, or constructing new lanes. In some areas, right of way is constrained, or intersections are in environmentally sensitive areas, limiting the ability to construct new lanes. Specific mitigation measures would be selected as individual projects are planned.

Significance After Mitigation Because of uncertainties associated with the extent of intersection improvements, this would be a significant unavoidable impact. (**SU**)

Responsibility and Monitoring County DTPW, in cooperation with Sonoma County PRMD for access management and land use issues would be responsible to implement these improvements.

TRANSIT

Impact 4.2-5 Increased Demand for Transit Services

*Implementation of the Draft GP 2020 would result in increased demand for transit services. Implementation of policies included in the Draft GP 2020 would result in improvements in transit services. This would be a less-than-significant impact. **(LTS)***

Implementation of the *Draft GP 2020* would result in additional residential and non-residential land use development. A portion of the people associated with the additional development would use public transit. Thus, the demand for transit service would increase. Furthermore, one of the strategies of the *Draft GP 2020* to solving the congestion problem on the roadway network is the development of an effective transit system.

The *Draft GP 2020* contains a number of goals and policies that would improve transit service in Sonoma County. Goal **CT-4** and policies **CT-4a** and **CT-4c** would promote the reduction of future congestion along the US 101 by developing the SMART project. Policy **CT-1d** would call for the County to work with cities to provide jobs, housing, and shopping along the SMART Rail Corridor in order to reduce the need for automobile travel. Policy **CT-1e** would support the development, implementation, and operation of a commuter rail system and continuous north-south pedestrian and bicycle path along the SMART corridor, including funding necessary to support a multi-modal feeder system. Policy **CT-1j** would support a sales tax or similar local funding mechanism to pay for the major regional circulation and transit system improvements, such as the commuter rail system. Policy **CT-1k** would result in a subregional traffic mitigation fund for road and transit improvements. Goal **CT-2** would promote an increase in opportunities for transit systems, pedestrians, bicycling and other alternative transportation modes to reduce the demand for automobile travel. Policies **CT-2a** through **CT-2aa** would strive to increase the opportunities for use of transit systems, as well alternative modes to the single occupant vehicle.

To the extent that the County has jurisdiction and involvement in decision making, implementation of the *Draft GP 2020* policies would increase transit service and therefore reduce transit impacts to a less-than-significant level. However, many transit services and improvements are decided by special districts such as SMART and not the County. Lack of funding could affect the ability of the transit service providers to increase transit service. In that event, as discussed above, transit service will not keep pace with demand.

Mitigation Measure 4.2-5 None required.

Impact 4.2-6 Air Traffic Safety

*Land uses and development consistent with the Draft GP 2020 could be subject to safety risks from air traffic at the county's six airports. However, existing regulations and policies contained in the Draft GP 2020 would reduce this to a less-than-significant impact. **(LTS)***

Implementation of the *Draft GP 2020* would not result in the development of any new airports nor any changes to the locations of Sonoma County's six existing airports. General aviation air operations would be expected to increase above current levels, particularly at the Sonoma County Airport. While commercial air operations would be expected to increase at the Sonoma County Airport, such an increase would not exceed levels that are currently permitted nor would it exceed the peak levels of service that have occurred in the past. Current and projected levels of air operations at Sonoma County's airports are discussed in greater detail in *Impact 4.4-5 Airport Noise*.

Sonoma County's six airports would continue to be subject to the regulations of the Airport Land Use Commission (ALUC) as well as the existing and proposed policies in the General Plan Air Transportation Element (ATE). Land uses within the ALUC designated referral areas that surround each airport would continue to be subject to the policies and standards set forth in the ALUC's adopted *Comprehensive Airport Land Use Plan*. These regulations, as well as the policies of the ATE, would provide protection for the future operations of the airports as well as providing for the safety and compatibility of land uses around the airports.

Since future land uses and development involving residential, commercial, industrial, and public uses would continue to be subject to these regulations and policies, this would be a less-than-significant impact.

Mitigation Measure 4.2-6 None required.

Impact 4.2-7 Conflict with Alternative Transportation

Land uses and development consistent with the Draft GP 2020 could conflict with adopted plans, policies, and programs supporting alternative transportation modes, such as bicycle, pedestrian, rail, and other modes of travel. However, proposed policies in the Draft GP 2020 would reduce this to a less-than-significant impact. ***(LTS)***

Section 65089(b) (A) of the Government Code requires that general plans contain "trip reduction and travel demand element that promotes alternative transportation methods, including but not limited to carpools, vanpools, transit, bicycles, and park-and-ride lots; improvements in the balance between jobs and housing; and other strategies, including but not limited to, flexible work hours, telecommuting, and parking management programs." The Circulation and Transit Element of the *Draft GP 2020* includes provisions for increasing transportation alternatives to automobile use. In addition, the Open Space and Resource Conservation Element of the *Draft GP 2020* includes a previously adopted Bikeways Plan establishing the County's Goals, Objectives, Policies and standards supporting bicycle travel for both transportation and recreational purposes. Also, the Metropolitan Transportation Commission, the regional transportation agency for planning and allocating funding, adopted a Regional Transportation Plan that coordinates regional transportation systems and improvements. All future development projects occurring through the provisions of the *Draft GP 2020* would adhere to the County and regional policies, plan, and programs in place to support alternative modes of transportation. Adherence to these provisions would reduce potential impacts to below a level of significance.

Mitigation Measure 4.2-7 None required.

Impact 4.2-8 Lack of Parking Capacity or Emergency Access

Land uses and development consistent with the Draft GP 2020 could result in safety hazards or lack of emergency services due to inadequate parking and / or insufficient access for emergency vehicles. However, existing regulations and proposed policies in the Draft GP 2020 would reduce this to a less-than-significant impact. ***(LTS)***

Residential, commercial, industrial, and public uses, as well as some agricultural uses, may draw substantial numbers of visitors, customers, and employees that need adequate parking space not only to allow the use to function, but also to assure that people don't park in unsafe locations, especially close to through traffic. At the same time, sufficient space needs to be available for emergency services and vehicles to access these uses in the event of health and safety emergencies.

The existing Zoning Code, as well as policies contained in the *Draft GP 2020*, would reduce the likelihood that land uses and development would result in inadequate parking or emergency access. Proposed projects are currently subject to the Parking Standards in the Zoning Code that establish the level of parking necessary to accommodate various uses and to avoid the potential for occupants of these uses to park in unsafe locations. Similarly, proposed land uses and development are subject to review by both Sonoma County and local district fire and emergency service agencies in order to assure adequate access is provided. Policies contained in the *Draft GP 2020*, such as **PS-3e** and **PS-3f** would assure that emergency service providers continue to be involved in this project review function as well as future evaluation and updates of applicable code provisions.

Since future land uses and development involving all land uses would continue to be subject to these regulations and policies, this would be a less-than-significant impact.

Mitigation Measure 4.2-8 None required.

Impact 4.2-9 Safety Risk from Transportation System Design

Land uses and development consistent with the Draft GP 2020 could result in an increase in safety hazards associated with transportation design features or with incompatible uses of the road system. However, existing regulations and proposed policies in the Draft GP 2020 would reduce this to a less-than-significant impact. ***(LTS)***

As the County and State road and transit systems are developed and improved, design factors often come into play in response to environmental concerns, neighborhood compatibility, agricultural operations, traffic volumes, access, geologic and slope constraints, etc. The primary overriding factor in all of these design issues is public safety. The County and State both follow roadway design standards that provide for roadway safety. The County Bikeways Plan provides standards to accommodate bicycle travel. Sonoma County would continue to use the American Association of State Highway Transportation Officials (AASHTO) road classification system and guidelines for geometric design (Objective **CT-3.4**) under the *Draft GP 2020*. These guidelines allow for flexibility to accommodate all of the above factors, but in all cases provide for public safety. Compliance with these guidelines would reduce the likelihood that safety hazards would occur due to design features. Similarly, the design guidelines would allow for issues such as roadway use by farm vehicles to occur in a safe manner in concert with other traffic use of the roadway.

In addition, the *Draft GP 2020* would include other policies that address transportation system safety. Policies **CT-3c** and **CT-3d** include provisions for traffic safety as part of the implementation of traffic calming measures or local community design guidelines. Policy **CT-3e** gives priority to safety improvements on roadways whenever safety problems arise. Policies **CT-2v** and **CT-2w** provide for urban and community design that prioritizes pedestrian safety.

Since future transportation improvements would continue to be subject to these regulations and policies, this would be a less-than-significant impact.

Mitigation Measure 4.2-9 None required.

4.3 AIR QUALITY

Air Quality – Environmental Setting

This section addresses the current air quality setting in Sonoma County, as well as the federal and State regulations as they apply in the county. Air quality impacts are most closely related to the *Open Space and Resource Conservation* and the *Circulation and Transit* elements of the *Draft GP 2020.*

AIR POLLUTION CLIMATOLOGY

Sonoma County has complex geography and climates. The coastal mountain ranges from several valleys with varying climate regimes. This section discusses the climatology of the sub-regional air basins within the county: the Cotati / Petaluma Valleys, Sonoma Valley, and Alexander Valley.

Cotati / Petaluma Valleys

The Cotati Valley to the north and Petaluma Valley to the south create a wide basin stretching from Santa Rosa to San Pablo Bay. These valleys are bordered on the east by the Sonoma Mountains. To the west is a series of low hills and the Estero Lowlands, a relatively flat area surrounding Estero Americano, which is the southern boundary of the county at that point. The region from the Estero Lowlands to San Pablo Bay is known as the Petaluma Gap. This low-level gap in the coastal hills is a major source of marine air flow into the county and the northern Bay Area.

Wind patterns in the Petaluma and Cotati Valleys are strongly influenced by the Petaluma Gap, with winds predominantly from the west. As marine air travels through the Petaluma Gap, it creates northward and southward air currents moving into the Cotati and Petaluma Valleys. The southward path continues into San Pablo Bay and through the Carquinez Strait. Because of this pattern, the prevailing wind direction in Santa Rosa is from the southwest while the prevailing wind direction in Petaluma is from the northwest.

The air pollution potential (i.e., the limitation of the atmosphere's ability to transport and dilute pollutants) is low in the Petaluma Valley because of the influence of the Petaluma Gap. Pollution potential is higher in the Cotati Valley, which is less well ventilated and has natural barriers to air flow to the north and east.

Sonoma Valley

The Sonoma Valley is a long, narrow valley running north-south between the Sonoma Mountains on the west and the taller Mayacamas Mountains to the east. Sheltered from winds flowing through the Petaluma Gap, the Sonoma Valley winds are lighter than in the western portions of the county and tend to be from the south during the day and from the north during the night.

The air pollution potential of the Sonoma Valley is high. Prevailing wind can transport locally and regionally generated pollutants northward into the narrow valley, which often traps and concentrations the pollutants under stable conditions. The local upslope (southerly) and downslope (northerly) flows set up by the surrounding mountains may also recirculate pollutants.

Alexander Valley

Alexander Valley is a relatively narrow valley aligned northwest to southeast, bound on the west by the coastal mountains and on the east by the Mayacamas Mountains. Although Alexander Valley is part of a different watershed, there is little terrain separating the Alexander Valley from the Cotati Valley to the south. While the Alexander Valley is ventilated by marine air moving up the Russian River valley, it is also influenced by wind flows traveling northward from the heavily-populated Cotati Valley.

The air pollution potential of the Alexander Valley is high. As an interior valley surrounded by high mountains it has frequent light winds and, like all of California, is subject to periods of high atmospheric stability. Although lightly developed with few industries, it is downwind of the Cotati Valley under certain wind conditions and is affected by pollutants transported into the local air basin.

AIR POLLUTANTS OF CONCERN IN SONOMA COUNTY

The State and federal ambient air quality standards cover a wide variety of pollutants. Only a few of these pollutants are problems in Sonoma County, due to either the extent of emissions or the climate of the region. Following is a description of problem pollutants in Sonoma County.

Ozone

Ground level ozone, often referred to as smog, is not emitted directly, but is formed in the atmosphere through complex chemical reactions between nitrogen oxides (NO_x) and reactive organic gases (ROG) in the presence of sunlight. The principal sources of NO_x and ROG, often termed ozone precursors, are combustion processes (e.g., by automobiles and aircraft) and evaporation of solvents, paints, and fuels. Motor vehicles are the single largest source of ozone precursor's emissions in Sonoma County. Exposure to ozone can cause eye irritation, aggravate respiratory diseases, and damage lung tissue, as well as harm vegetation and reduce visibility.

Ozone concentrations in the Bay Area and southern North Coast Air Basin have shown no strong trends over the last ten years. There is considerable year-to-year variation in levels due to the influence of weather.

Particulate Matter (PM_{10} and $PM_{2.5}$)

Particulates are solid or liquid particles, including smoke, dust, aerosols, and metallic oxides that are small enough to remain suspended in the air for a long period of time. PM_{10} is particulate matter less than ten microns in diameter. $PM_{2.5}$ is particulate matter less than 2.5 microns in diameter. There are many sources of particulate matter emissions, including combustion, industrial processes, grading and construction, farming operations, wind blown dust, and motor vehicles. Of the particulate matter emissions associated with motor vehicle use, some are tailpipe and tire wear emissions, but greater quantities are generated by re-suspended road dust. Consequently, improvements in motor vehicle engines and fuels have not reduced particulate matter emissions as significantly as they have reduced emissions of other pollutants.

Wood burning is a significant source of particulate matter, particularly during episodes when levels of particulate concentrations are highest as on a still and cold night. Wood smoke carries other pollutants, including carbon monoxide, nitrogen dioxide, and volatile organic compounds that include dioxin, benzene, and formaldehyde.

Health effects of particulate matter vary depending on a number of factors, including the type and size of the particle. Research has shown a correlation between highly inhalable particulate matter (PM_{10}) concentrations and increased mortality rates. Elevated levels can also aggravate chronic respiratory illness such as bronchitis and asthma. Fine particulate matter ($PM_{2.5}$) is a concern because it can bypass the body's natural filtration system more easily than larger particles, and can lodge deep in the lungs. The largest emission sources for PM_{10} consist of construction and farming operations, entrained road dust, and wind blown dust. The major sources of $PM_{2.5}$ are combustion of fuels and smoke. Both PM_{10} and $PM_{2.5}$ are also created as secondary pollutants in the atmosphere through chemical and photochemical processes.

Particulate matter concentrations in the Bay Area and southern North Coast Air Basin have shown no strong overall trends over the last ten years. While many stationary sources of particulate matter such as factories and mills have either closed or been controlled, area sources such as vehicle traffic and residential wood-burning have been increasing, off-setting the reductions in the stationary emissions.

Diesel Exhaust

In 1998, after a ten year scientific assessment process, the Air Resources Board identified particulate matter from diesel-fueled engines as a toxic air contaminant (TAC). The state of California has begun a program of identifying and reducing risks associated with particulate matter emissions from diesel-fueled vehicles. The program consists of new regulatory standards for all new on-road, off-road and stationary diesel-fueled engines and vehicles, new retrofit requirements for existing on-road, off-road and stationary diesel-fueled engines and vehicles, and new diesel fuel regulations to reduce the sulfur content of diesel fuel as required by advanced diesel emission control systems.

The need to separate residential uses from sources of diesel can be in conflict with the need to locate housing near bus service. The design, layout and orientation of high-density housing needs to minimize exposure of residents to diesel exhaust. This apparent conflict is likely to be reduced in the future as bus systems switch to cleaner diesels or alternatively fueled vehicles.

Diesel particulate is a relatively inert pollutant (i.e., is not modified in the atmosphere). It is a localized pollutant in that the highest concentrations are found near the source and concentration decreases with distance from the source. The regulation of diesel exhaust from trucks and buses is achieved at the State and federal levels. At the local level, appropriate policies that would site residences, schools, day care centers and other sensitive receptors away from major sources of diesel exhaust (e.g., truck haul routes, warehouses, and distribution centers) can greatly reduce exposures and health risks. Local transit and school districts are now mandated in California to purchase buses with lower emissions.

Wood Smoke

Wood smoke has long been identified as a significant source of pollutants in urban and suburban areas. Wood smoke contributes to particulate matter and carbon monoxide concentrations, reduces visibility, and contains numerous Toxic Air Contaminants. The particles are composed of organic vapors, carbon, and minerals that are not properly burned in the early phases of a fire. Present State controls on this source include the adoption of emission standards for wood stoves and fireplace inserts. Within the San Francisco Bay Air Basin some jurisdictions have adopted local woodsmoke ordinances, based on the Bay Area Air Quality Management District (BAAQMD) model wood burning ordinance. The Northern Sonoma County Air Pollution Control District's Regulation IV prohibits the installation of conventional fireplaces in new construction and remodels, and requires

that any wood-burning devices be certified. Wood smoke regulation is likely to increase with the recent adoption of $PM_{2.5}$ State and federal standards.

Toxic Air Contaminants

Toxic air contaminants (TACs) are another group of pollutants of concern. Unlike criteria pollutants, no safe levels of exposure to TACs can be established. There are many different types of TACs, with varying degrees of toxicity. Sources of TACs include industrial processes (e.g., petroleum refining and chrome plating operations), commercial operations (e.g., gasoline stations and dry cleaners), and motor vehicle exhaust. Public exposure to TACs can result from emissions resulting from normal operations, as well as accidental releases of hazardous materials during upset conditions. The health effects of TACs include cancer, birth defects, neurological damage, and death.

Other Air Quality Issues

Other air quality issues of concern in the Sonoma County include nuisance impacts of odors and dust. Objectionable odors may be associated with a variety of pollutants and operations. Common sources of odors include concentrated animal operations, wastewater treatment plants, landfills, composting facilities, and industrial plants. Similarly, nuisance dust may be generated by a variety of sources including mining, agriculture, grading, and construction. Odors rarely have direct health impacts, but they can be very unpleasant and can lead to anger and concern over possible health effects among the public.

Northeastern Sonoma County contains geothermal resources that are a potential source of an odorous substance, hydrogen sulfide. Rule 455 of the rules and regulations of the Northern Sonoma County Air Pollution Control District contain specific limitations on emissions of hydrogen sulfide from geothermal power plants. The adoption of this regulation and the general decline in geothermal production at the Geyser geothermal field has greatly reduced the potential for odor problems from this source.

AMBIENT AIR QUALITY STANDARDS

The federal and California ambient air quality standards for important pollutants are summarized in **Exhibit 4.3.1**. These standards were developed independently with differing purposes and methods, although both processes attempt to avoid health-related effects. As a result, the federal and State standards differ in some cases. In general, the State standards are more stringent. This is particularly true for ozone and PM_{10}.

Exhibit 4.3-1
Federal and State Ambient Air Quality Standards

Pollutant	*Averaging Time*	*Federal Primary Standard*	*State Standard*
Ozone	1-Hour	0.12 ppm	0.09 ppm
	8-Hour	0.08 ppm	--
Carbon Monoxide	8-Hour	9.0 ppm	9.0 ppm
	1-Hour	35.0 ppm	20.0 ppm
Nitrogen Dioxide	Annual	0.05 ppm	--
	1-Hour	--	0.25 ppm
Sulfur Dioxide	Annual	0.03 ppm	--
	24-Hour	0.14 ppm	0.04 ppm
	1-Hour	--	0.5 ppm
PM_{10}	Annual	50 ug/m^3	20 ug/m^3
	24-Hour	150 ug/m^3	50 ug/m^3
$PM_{2.5}$	Annual	15 ug/m^3	12 ug/m^3
	24-Hour	65 ug/m^3	--
Lead	30-Day Avg.	--	1.5 ug/m^3
	Month Avg.	1.5 ug/m^3	--

ppm = parts per pillion
ug/m^3 = Micrograms per Cubic Meter

Source: *California Air Quality Standards*, California Air Resources Board, July 9, 2003.

SONOMA COUNTY EXISTING AIR QUALITY

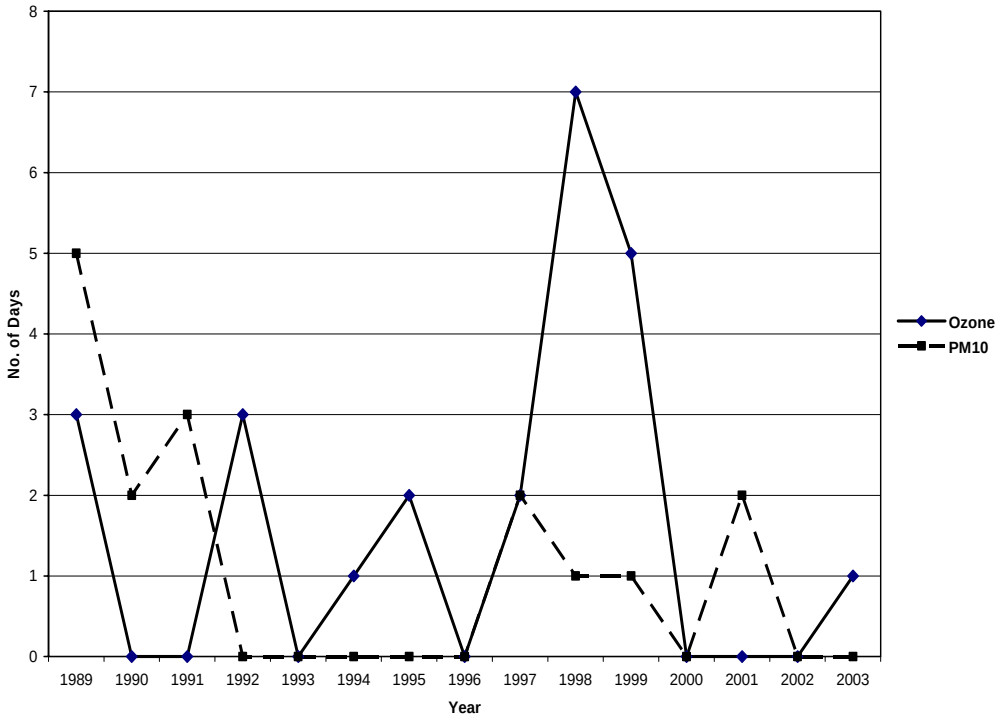
The two air quality monitoring sites in Sonoma County are located in Healdsburg and Santa Rosa. Multiple pollutants are monitored in Santa Rosa while the monitoring site in Healdsburg measures a single pollutant, ozone. **Exhibit 4.3-2** below summarizes violations of air quality standards in Sonoma County for the five-year period 1999-2003. **Exhibit 4.3-3** shows graphically the total number of violations of the most stringent ambient standards for Sonoma County monitoring sites from 1989 to 2001.

Exhibit 4.3-2
Air Quality Data Summary for Sonoma County, 1999-2003

Pollutant	***Standard***	***Location***	***Days Standard Exceeded In:***				
			1999	***2000***	***2001***	***2002***	***2003***
Ozone	Federal 1-Hour	Santa Rosa Healdsburg	0 0	0 0	0 0	0 0	0 0
Ozone	State 1-Hour	Santa Rosa Healdsburg	1 4	0 0	0 0	0 0	1 0
Ozone	Federal 8-Hour	Santa Rosa Healdsburg	0 2	0 0	0 0	0 0	0 0
PM10	Federal 24-Hour	Santa Rosa	0	0	0	0	0
PM10	State 24-Hour	Santa Rosa	1	0	2	2	0
PM2.5	Federal 24-Hour	Santa Rosa	0	0	1	0	0
Carbon Monoxide	State / Federal 8-Hour	Santa Rosa	0	0	0	0	0
Nitrogen Dioxide	State 1-Hour	Santa Rosa	0	0	0	0	0

Source: Air Resources Board, Aerometric Data Analysis and Management (ADAM), 2004.

Exhibit 4.3-3
Days Exceeding State Air Quality Standards, 1989 - 2003



Source: Air Resources Board, Aerometric Data Analysis and Management (ADAM), 2002.

SENSITIVE RECEPTORS AND POLLUTION SOURCES

Sensitive receptors are facilities where sensitive receptor population groups (i.e., children, the elderly, the acutely ill, and the chronically ill) are likely to be located. These land uses include residences, schools, retirement homes, convalescent homes, hospitals, and medical clinics. Such sensitive receptors are located in all areas of the county.

The emissions inventory for Sonoma County shows that the single largest source of ozone precursors is motor vehicle travel. Other major sources are solvent evaporation, industrial sources, and combustion of fuels. Major sources of particulate matter are road dust, residential wood burning, unpaved road travel, construction activities and mineral extraction and processing.

The air districts maintain inventories of sources of toxic air contaminants (TACs). The current inventory identifies numerous dry cleaners and gasoline stations as the most common sources of TACs in the county. Almost all of these sources are located within the jurisdiction of the cities of Santa Rosa, Petaluma, Rohnert Park, Sebastopol, Sonoma and Windsor. Other sources of TACs include mineral processing plants, sewage treatment facilities, and geothermal power plants.

Since identification, quantification, and control of TAC emissions began in the late 1980s, emissions of these pollutants have been steadily declining.

Air Quality – Regulatory Setting

COUNTY AND REGIONAL REGULATIONS

The county is part of two distinct air basins and air districts (see **Exhibit 4.3-4** Air Quality Management Basins / Districts). The boundary between the air basins / districts runs roughly from the southwest corner of the county at Estero Americano, northeasterly to the northeast corner of Sonoma County at its boundary with Lake and Napa County. The boundary between the two basins / districts crosses US 101 between Windsor and Healdsburg.

The northwestern portions of the county are part of the North Coast Air Basin, consisting of Del Norte, Humboldt, Trinity, Mendocino, and northern Sonoma County. This portion of the county is within the Northern Sonoma County Air Pollution Control District (NSCAPCD). The NSCAPCD is primarily rural and mountainous, containing only two urbanized areas-Healdsburg and Cloverdale). Southern Sonoma County is part of the nine-county San Francisco Bay Air Basin and the Bay Area Air Quality Management District (BAAQMD).

The BAAQMD and NSCAPCD are local air quality agencies responsible for preparing regional air quality plans under the state and federal Clean Air Acts. In addition to planning responsibilities, the local air district has permitting authority over stationary sources of pollutants. Authority over mobile sources of pollutants resides with the California Air Resources Board.

As noted previously, the NSCAPCD has adopted regulations prohibiting installation of conventional fireplaces in new construction and remodels and requiring that wood burning devices meet certain standards. Recently Sonoma County adopted a similar ordinance for the portion of the County within the BAAQMD.

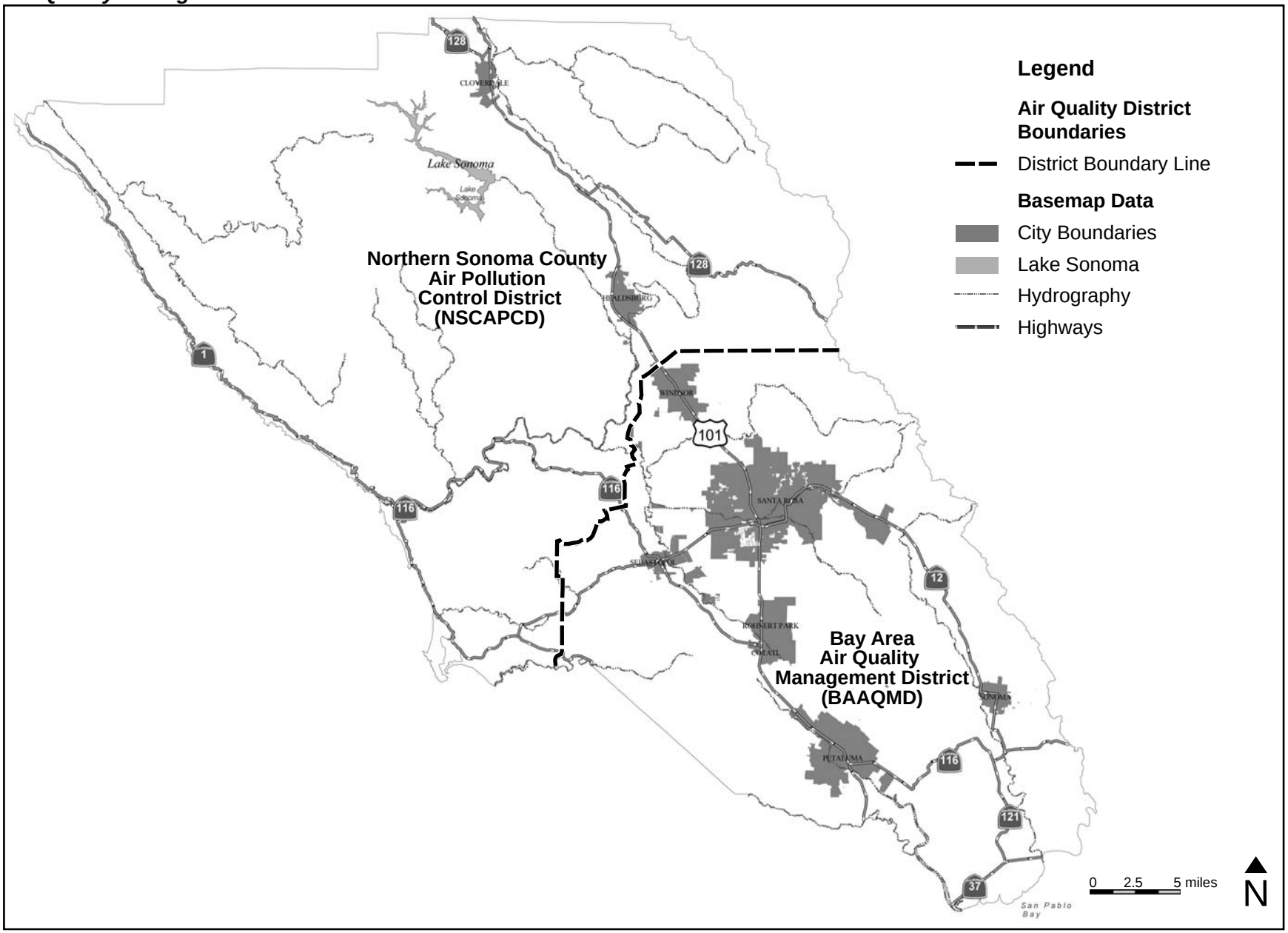
The BAAQMD implemented a new monitoring system that begun in December, 2003. Along with *Spare the Air Days*, usually declared in summer, *Spare the Air Tonight* nights are also declared. Generally most of these nights are declared during the December through February period, when the highest wintertime pollution occurs on cold windless nights.

A *Spare the Air Day* is a day forecast to have ozone levels high enough to exceed federal health-based standards. An advisory is issued the day before this is expected to occur. Area residents are asked to modify their behavior to help minimize pollution, and people who are sensitive to unhealthy air are advised to limit their time outdoors, particularly in the afternoon hours.

Smart Growth

The BAAQMD, together with five other regional agencies, has recently embarked on a program to encourage compact, in-fill development near public transit. The program promotes high-density development with transit orientation, termed *smart growth*, as a means of combating the increasing use of automobiles in the region and thus improve air quality by reducing ozone precursors and particulate matter re-suspension.

Exhibit 4.3-4
Air Quality Management Basins / Districts



Source: Sonoma County PRMD, 2005

STATE REGULATIONS

The State has its own air quality standards and air pollution planning programs. In 1988 the California legislature passed the California Clean Air Act, which required air districts to develop air quality plans to meet State standards. In general, the California Clean Air Act required the reduction of air pollutants by five percent or more per year or the implementation of "all feasible measures" to meet the state air quality standards as expeditiously as possible.

Areas that have met these State standards are considered to be *attainment areas.* Similarly, areas that have not met these standards are determined to be *nonattainment areas*. An area that is close to attaining the standard would be given a *nonattainment / transitional* designation.

The San Francisco Bay Area Air Basin was initially determined to be a state nonattainment area for carbon monoxide, ozone, and PM_{10} (e.g., solid and liquid particles of dust, soot, aerosols and other matter that are small enough to remain suspended in the air for a long period of time). The Bay Area was reclassified as an attainment area for carbon monoxide, but remains an ozone and PM_{10} nonattainment area.

The NSCAPCD portion of the county is nonattainment for the state ozone and PM_{10} standard. The ozone designation is nonattainment / transitional, denoting that the area is close to attaining the standard.

FEDERAL REGULATIONS

Air pollution control and planning began in earnest in 1967 with the passage of the Federal Clean Air Act. In 1970 the National Ambient Air Quality Standards (NAAQS) were established for six pollutants. These pollutants are commonly referred to as *criteria pollutants* because criteria documents, which establish the relationship between exposure and effects on human health, have been prepared for each contaminant. The Act required states exceeding the NAAQS to prepare air quality plans showing how the standards were to be met by 1987. The Act was amended in 1977 and in 1990 to extend the deadline for compliance. Failure to submit and implement an acceptable plan meant a state could be denied federal highway funding.

The BAAQMD portion of the county was initially classified as a federal nonattainment area for carbon monoxide and ozone. Ambient levels of carbon monoxide have been steadily declining in the Bay Area since the 1970s, and in 1998 the entire Bay Area was re-designated as an attainment area for this pollutant.

Ozone levels also have been declining since the 1970s, but in a less consistent manner. Based on monitoring data from 1990 to 1992, the Bay Area was re-designated as a federal attainment area for ozone in 1995. However, violations of the ozone standard in 1995 and 1996 caused the U.S. Environmental Protection Agency to re-designate the Bay Area back to nonattainment status, requiring preparation of an updated air quality plan. The Bay Area is considered to have attained all the NAAQS with the exception of the standard for ozone. The NSCAPCD portion of the county is classified as having attained all federal standards.

Air Quality – Significance Criteria

Appendix G of the *State CEQA Guidelines* provides that a project would have a significant air quality impact if it would:

- Conflict with or obstruct implementation of the applicable air plan;
- Violate any air quality standard or contribute substantially to an existing or projected air quality violation;
- Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard;
- Expose sensitive receptors to substantial pollutant concentrations; or
- Create objectionable odors affecting a substantial number of people.

The *State CEQA Guidelines* further states that, where available, the significance criteria established by the applicable air quality management or air pollution control district may be relied upon to make the above determinations.

The Northern Sonoma County APCD has not adopted thresholds of significance, but the Bay Area Air Quality Management District has developed thresholds of significance specifically for local plans. Inconsistency with the most recently adopted Clean Air Plan (CAP) is considered a significant impact. According to the BAAQMD, the following criteria must be satisfied for a local plan to be determined to be consistent with the CAP and not have a significant air quality impact: [1]

- The local plan demonstrates reasonable efforts to implement the Transportation Control Measures (TCMs) included in the CAP that identify cities as implementing agencies;
- The local plan must be consistent with the CAP population and Vehicle Miles Traveled (VMT) assumptions. This is demonstrated if the population growth over the planning period will not exceed the values included in the current CAP and the rate of increase in VMT is equal to or less than the rate of increase in population; and
- For local plans to have a less than significant impact with respect to potential odors and / or toxic air contaminants, buffer zones should be established around existing and proposed land uses that would emit these air pollutants.

1 Bay Area Air Quality Management District, BAAQMD CEQA Guidelines, April 1996 (Revised December 1999)

Air Quality – Impacts and Mitigation Measures

Impact 4.3-1 Increased Emissions of Ozone Precursors

*Land uses and development consistent with the Draft GP 2020 would result in increased emissions of ozone precursors resulting primarily from vehicles. The increase of emissions within the NSCAPCD would be a less-than-significant impact. However, within the jurisdiction of the BAAQMD, the increased emissions would exceed the District's Clean Air Plan (CAP) thresholds. This would be a significant impact. (**S**)*

To not have a significant impact with respect to ozone, a general plan must be shown to:

- Demonstrate reasonable efforts to implement the Transportation Control Measures (TCMs) included in the CAP that identify cities as implementing agencies; and
- Be consistent with the Clean Air Plan (CAP) population and Vehicle Miles Traveled (VMT) assumptions.

The *Draft GP 2020* relationship to each of these criteria is described below separately.

IMPLEMENTATION OF TRANSPORTATION CONTROL MEASURES

Exhibit 4.3-5 lists the *Draft GP 2020* policies that would support the Clean Air Plan Transportation Control Measures (TCMs). For each TCM a description is provided and a listing of relevant *Draft GP 2020* policies is given. The *Draft GP 2020* policies would support and implement regional TCMs.

Exhibit 4.3-5
Transportation Control Measures (TCMs) to be Supported by County General Plans

TCM	*Description*	*Relevant Draft GP 2020 Programs*
1. Expand Employee Assistance Program	Provide assistance to regional and local ridesharing organizations.	Policy **CT-1e**: Support development, implementation and operation of a commuter rail system and contiguous north-south pedestrian and bicycle path along the SMART corridor including the funding necessary to support a multi-modal feeder system. Policy **CT-2t**: Encourage measures that increase the average occupancy of vehicles including (1) vanpools or carpools, ridesharing programs for employees, preferential parking, parking subsidies for rideshare vehicles, and transportation coordinator positions, (2) preferential parking space and fees for rideshare vehicles, flexibility in parking requirements, HOV lanes on freeways, and residential parking permit restrictions around major traffic generators.

TCM	*Description*	*Relevant Draft GP 2020 Programs*
9. Improve Bicycle Access and Facilities	Establish and maintain bicycle advisory committees in all nine Bay Area Counties. Develop comprehensive bicycle plans. Encourage employers and developers to provide bicycle access and facilities. Improve and expand bicycle lane system.	Policies **OSRC-18a-18v**. Policy **CT-1e**: Support development, implementation and operation of a commuter rail system and contiguous north-south pedestrian and bicycle path along the SMART corridor including the funding necessary to support a multi-modal feeder system. Policy **CT-2z**: Implement the Sonoma County Bikeway Plan as described in the Open Space and Resource Conservation Element.
12. Improve Arterial Traffic Management	Continue ongoing local signal timing programs. Study signal preemption for buses on arterials with high volumes of bus traffic. Expand signal timing programs. Improve arterials for bus operations and encourage bicycling.	Policy **CT-1c**: Work with cities to provide locations for jobs, housing and shopping along the US 101corridor to reduce the volume of traffic on east/west corridors. Policy **CT-2c**: On transit routes, design the physical layout and geometrics of arterial and collector highways to be compatible with bus operations.
15. Local Clean Air Plans, Policies and Programs	Incorporate air quality beneficial policies and programs into local planning and development activities, with a particular focus on subdivision, zoning and site design measures that reduce the number and length of single-occupant automobile trips.	Policy **CT-1h**: Evaluate the traffic impacts of new development with respect to its contribution to housing affordability and maintaining jobs/housing balance. Policy **CT-2e**: Require major employment centers/businesses to provide facilities and Traffic Demand Management programs that support alternative transportation modes, such as bike and shower facilities, telecommuting, flexible schedules, etc.
17. Conduct Demonstration Projects	Promote demonstration projects to develop new strategies to reduce motor vehicle emissions. Projects include low emission vehicle fleets and LEV refueling infrastructure.	Policy **CT-2r**: Promote a traffic demand Management program for County Government and schools. Policy **CT-2e**: Require major employment centers/businesses to provide facilities and Traffic Demand Management programs that support alternative transportation modes, such as bike and shower facilities, telecommuting, flexible schedules, etc.

TCM	*Description*	*Relevant Draft GP 2020 Programs*
19. Pedestrian Travel	Review/revise general/specific plan policies to promote development patterns that encourage walking and circulation policies that emphasize pedestrian travel and modify zoning ordinances to include pedestrian-friendly design standards. Include pedestrian improvements in capital improvements programs. Designate a staff person as a Pedestrian Program Manager.	Policy **CT-1e**: Support development, implementation and operation of a commuter rail system and contiguous north-south pedestrian and bicycle path along the SMART corridor including the funding necessary to support a multi-modal feeder system. Policy **CT-2b**: Locate transit centers to avoid rerouting by buses, provide adequate off-street parking, and provide convenient pedestrian access from activity centers. Policy **CT-2v**: Work with school districts and private school developers to provide safe pedestrian access to public and private schools.
20. Promote Traffic Calming	Include traffic calming strategies in the transportation and land use elements of general and specific plans. Include traffic calming strategies in capital improvement programs.	Policy **CT-1c**: Work with cities to provide locations for jobs, housing and shopping along the US 101corridor to reduce the volume of traffic on east/west corridors. Policy **CT-2c**: On transit routes, design the physical layout and geometrics of arterial and collector highways to be compatible with bus operations. Policy **CT-3c**: Designate the roadway segments for traffic calming improvements on Figures CT1a to 1i. Traffic calming improvements are primarily intended to accommodate local circulation, reduce traffic volumes, and lower speeds to promote the safety of pedestrians and bicycles

Source: Donald Ballanti, Certified Consulting Meteorologist

CONSISTENCY WITH CLEAN AIR PLAN ASSUMPTIONS

The *Draft GP 2020* would be consistent with the latest Association of Bay Area Government (ABAG) population projections that are used in the regional Clean Air Plan within the BAAQMD portion of the County. However, VMT within Sonoma County is expected to increase at a rate greater than population. Total VMT during the AM and PM peak hours in Sonoma County is forecast to increase 41 percent between 2000 and 2020, while population within the unincorporated portions of the county is forecast to increase by 15 percent and population of the county as a whole is forecast to increase by 19 percent during the same period. [2] [3]

[2] VMT increase based on traffic forecast model completed for *Sonoma General Plan 2020 Public Hearing Draft* by Dowling Associates.

The *Draft GP 2020* contains numerous policies and programs in the Land Use, Open Space and Resource Conservation, and Circulation and Transit Elements that, if adopted and implemented, would act to reduce VMT and / or reduce the rate of increase in VMT.

Policies **LU-11a**, **RC-16b**, **CT-1b**, **CT-1d**, **CT-1e**, **CT-2b**, **CT-2e**, **CT-2s**, **CT-2x**, **CT-2y** and **CT-2z** would reduce VMT by encouraging alternatives to the single occupancy vehicle. For example, Policy **LU-11a** encourages alternatives to gas-powered vehicles such as public transit, bicycle and pedestrian routes, and bicycle and pedestrian-friendly development design. Policy **RC-16b** would encourage public transit, ridesharing and van pooling, shortened and combined motor vehicle trips to work and services, use of bicycles, and walking. Policy **CT-2d** and **CT-2e** would require major new businesses to include Traffic Demand Management Programs and transit facilities.

Policies **LU-3c**, **LU-11e**, **CT-1c**, **CT-1g**, **CT-1h**, **CT-1i**, and **CT-2t** would attempt to reduce VMT by affecting the number and / or length of vehicle trips. For example, Policy **LU-3c** would avoid urban sprawl by limiting the extension of sewer or water sewer services outside of designated urban services areas pursuant to the policies of the Public Services and Facilities Element. Policy **LU-11e** would encourage the use of compact and mixed-use development that minimizes the need to drive, re-uses existing infill and brownfield sites that have been thoroughly reclaimed and remediated before using open land, and avoids the extension of sprawl.

Policies **LU-1b**, **LU-1f**, **LU-1g,** and **LU-1i** could reduce VMT by requiring ongoing reviews and actions related to growth and development. For example, Policy **LU-1g** would use zoning to regulate the timing of development to assure a better balance between jobs and population.

While these policies and programs would reduce VMT, VMT within Sonoma County would still be expected to increase at a rate greater than that of the population. Within the Bay Area Air Quality Management District portion of the county, this would result in increased emissions of ozone precursors not accounted for in the regional air plan. Such an increase would threaten the eventual attainment of the State and federal ozone standards and / or require additional control measures to be adopted to offset the increased emissions or threaten transportation funds for the region. Within the Northern Sonoma County Air Pollution Control District portion of the county increased emissions of ozone precursors could threaten current attainment status, not only from emissions occurring in the NSCAPCD but from increased transport across the boundary with the BAAQMD. Therefore, this would be a significant impact.

Mitigation Measure 4.3-1 Add a new policy to the Open Space and Resource Conservation Element as follows:

> **Policy OSRC-16h**: Require that development within the Bay Area Air Quality Management District that generates high numbers of vehicle trips, such as shopping centers and business parks, to incorporate air quality mitigations in their designs.

Significance After Mitigation The above mitigation measure together with the *Draft GP 2020* policies would represent a comprehensive attempt to limit or reduce VMT through general plan policies and would be supportive of regional efforts to reduce the rate of increase in VMT. These policies, however, would not be able to reduce the rate of VMT increase to below the rate of

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3 Population increased derived from *Table LU-2 Population Trends and Projections, Sonoma General Plan 2020 Public Hearing Draft*, Sonoma County PRMD.

population increase, partially because the forecasted rate of VMT increase for the county is so high and because *GP 2020* policies can only affect the unincorporated portions of the county. After implementation of the above mitigation measures, countywide VMT would still increase at a rate greater than the rate of population increase. Therefore, this would be a significant unavoidable impact. (**SU**)

Responsibility and Monitoring The Board of Supervisors would be responsible for adopting the above policies as part of the *GP 2020*. The PRMD and air districts would be responsible for monitoring implementation.

Impact 4.3-2 Increased Particulate Emissions

Residential construction consistent with the Draft GP 2020 would result in increased wood-burning. Construction activities consistent with the Draft GP 2020 would result in emissions of dust and other air pollutants. This would be a less-than-significant impact. ***(LTS)***

New residential construction in the unincorporated portion of Sonoma County would result in an increase in wood burning that could affect local air quality and could result in increased nuisance complaints. Within the Northern Sonoma County APCD portion of the county, the installation of fireplaces and woodstoves is subject to NSCAPCD Regulation IV, which bans open fireplaces and only allows certified wood stoves or other clean alternatives. On February 22, 2005, Sonoma County adopted Ordinance 5546 that imposed similar restrictions within the unincorporated area of the county within the BAAQMD. Wood smoke from new residential construction in the unincorporated area would therefore be a less-than-significant impact.

Construction of individual projects would involve activities that result in air pollutant emissions. Construction activities would temporarily create emissions of dust, fumes, equipment exhaust, and other air contaminants.

Construction activities within the NSCAPCD portion of the county are regulated by the public nuisance provisions of NSCAPCD Rule 400 (General Limitations), the plume opacity limitations contained in NSCAPCD Rule 410 (Visible Emissions), and the dust suppression provisions of NSCAPCD Rule 430 (Fugitive Dust Emissions).

The *BAAQMD CEQA Guidelines* contain construction dust mitigation measures that are applied to individual development proposals through the environmental review process. Standard measures are employed for all construction sites, while enhanced measures are employed at large sites or at sites near sensitive receptors.

Highway construction projects are subject to Caltrans's Special Provisions and Standard Specifications that include requirements to minimize or eliminate dust through the application of water or dust palliatives.

Since construction activities consistent with the *Draft GP 2020* would be subject to the above regulations, this would represent a less-than-significant impact.

Mitigation Measure 4.3-2 None required.

Impact 4.3-3 Exposure to Odors / Toxic Air Contaminants
Land uses and development consistent with the Draft GP 2020 could emit odors and toxic contaminants that could affect nearby land uses. In addition, occupants of certain land uses proposed near major transportation corridors could be exposed to toxic air contaminants. This would be a significant impact. ***(S)***

Land uses could be proposed that would be occupied by employees, visitors, or residents that would be exposed to odors or toxic air contaminants that are present in the area from such sources as incinerators, traffic, hazardous waste repositories, and similar uses. Similarly, land uses which would generate odors or toxic air contaminants could be proposed that would result in exposure of people occupying the surrounding area to these problems. This would be a significant impact.

These impacts could be reduced as part of discretionary project review, but the most effective measure is typically the establishment of a buffer zone between the proposed use and the affected neighborhood. According to the *BAAQMD CEQA Guidelines*, for a General Plan to have a less than significant impact with respect to odors and toxic air contaminants, a buffer zone is needed. Such a measure would avoid unnecessarily high exposure of residents to cancer causing agents, irritants, and unpleasant odors.

***Mitigation Measure 4.3-3*(a)** Add a new policy to the Open Space and Resource Conservation Element as follows:

> **Policy OSRC-16k:** Ensure that any proposed new sources of toxic air contaminants or odors would provide adequate buffers to protect sensitive receptors and comply with existing health standards. Require consideration of odor impacts when evaluating discretionary land uses and development projects near wastewater treatment plants, or treatment plant expansion projects. Promote land use compatibility for new development by using buffering techniques such as landscaping, setbacks, and screening in areas where such land uses abut one another.

***Mitigation Measure 4.3-3*(b)** Add a new policy to the Open Space and Resource Conservation Element as follows:

> **Policy OSRC-16l**: Require that discretionary projects involving sensitive receptors (facilities or land uses that include members of the population sensitive to the effects of air pollutants, such as children, the elderly and people with illnesses) proposed near the US 101 corridor should include an analysis of mobile source toxic air contaminant health risks. Project review should include an evaluation of the adequacy of the setback from the highway and, if necessary, identify design mitigation measures to reduce health risks to acceptable levels.

Significance after Mitigation With adoption and implementation of the policies as outlined in Mitigation Measure 4.3-3(a) and 4.3-3(b), the BAAQMD thresholds of significance for air toxics and odors would be met. Therefore, this impact would be reduced to a less-than-significant level. **(LTS)**

Responsibility and Monitoring The Board of Supervisors would be responsible for adopting the above policies as part of *GP 2020*. The PRMD would be responsible for monitoring implementation.

Impact 4.3-4 Exposure to Industrial Diesel Truck Emissions
Industrial, mineral-extraction, and other land uses and development that generate diesel truck trips could result in exposures of people to diesel particulate (a Toxic Air Contaminant). This would represent a significant impact. ***(S)***

Land uses and development proposals that generate diesel vehicle trips (e.g., quarries, truck stops, and distribution centers) could cause an unacceptable increase in the cancer risk along roads providing access to the facility.[4] The State of California is implementing a risk management program that would reduce the health risks from diesel particulate over time. The statewide risk management program includes the three following components:

- New regulatory standards for all new on-road diesel vehicles that will result in a 90 percent reduction in particulate emissions from diesel engines;
- New retrofit requirements for existing on-road vehicles where determined to be technically feasible and cost-effective; and
- New diesel fuel regulations to reduce the sulfur content as needed by advanced diesel emission controls.

The projected emission benefit of the State program is a reduction in diesel exhaust particulate of 75 percent by 2010 and 85 percent by 2020.[5] It will be several years before state-mandated controls on trucks result in a substantial reduction in risk because of the relatively long life of diesel vehicles and the high cost of cleaner, newer vehicles. Although the state-mandated programs are likely to eventually reduce diesel truck impacts near industrial facilities to a less-than-significant level, problems with unacceptable risks being associated with facilities generating large amounts of truck traffic will continue for an unknown period of years. This would be a significant impact.

Mitigation Measure 4.3-4 Add a new policy to the Open Space and Resources Conservation Element as follows:

> **Policy OSRC-16m**: Work with the BAAQMD and NSCAPCD to adopt a diesel particulate ordinance regulating land uses that generate diesel vehicle trips. The ordinance should establish trip-based thresholds that trigger mitigation requirements either through source reduction or payment of a mitigation fee to off-set a project's impact in the same geographical area, and provide for periodic review to account for long-term changes in emission rates from diesel trucks.

Significance After Mitigation With adoption and implementation of the policy as outlined in Mitigation Measure 4.3-4, this impact would be reduced to a less-than-significant level. **(LTS)**

Responsibility and Monitoring The Board of Supervisors would be responsible for adopting the above policy as part of the *GP 2020*. The PRMD, BAAQMD, and NSAPCD would be responsible for monitoring and implementation.

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4 Don Ballanti communication with Barbara Lee, Air Pollution Control Officer, Northern Sonoma Air Pollution Control District, February 2005.

5 California Air Resources Board (CARB). 2000. *Risk Reduction Plan to Reduce Particulate Matter Emissions from Diesel-Fueled Engines and Vehicles.*

Impact 4.3-5 Aircraft Emissions

Air operations at Sonoma County airports consistent with levels projected by the Draft GP 2020 Air Transportation Element, could result in increased emissions in the region. These emissions are already included in the emission inventory that is the basis for regional air quality plans, and thus are not expected to impede attainment or maintenance of ambient air quality standards. This would be a less-than-significant impact. ***(LTS)***

Aircraft are mobile sources of air pollution that emit primarily ozone precursors (e.g., ROG and NOx), carbon monoxide, and sulfur dioxide. In general, aircraft are a minor source of emissions compared to on-road vehicles and other mobile sources. The California Air Resources Board maintains estimated emission inventories of aircraft emissions by county, utilizing the latest forecasts of aircraft activity and reflecting anticipated changes in emission rates for aircraft as emission control programs come into effect. **Exhibit 4.3-6** shows the CARB estimates of total aircraft emissions for Sonoma County in 2003, 2010 and 2020. Increases are shown for ROG and CO, while NOx emissions are expected to remain steady.

Exhibit 4.3-6 shows increased ROG emissions of 0.01 tons / day (20 pounds / day) between 2003 and 2020. This increase has already been included in the emission inventory that is the basis for regional air quality plans, and thus is not expected to impede attainment or maintenance the ambient air quality standards.

Sonoma County is an attainment area for carbon monoxide. Monitored levels are well below the State and federal ambient standards. As shown in **Exhibit 4.3-6,** the increased carbon monoxide emissions, would not result in any State or federal standards being exceeded. Therefore, this would represent a less-than-significant impact.

Mitigation Measure 4.3-5 None required.

Exhibit 4.3-6
Forecast Aircraft Emissions for Sonoma County (Tons/day)

Year	*ROG*	*NOx*	*CO*
2003	0.06	0.01	1.73
2010	0.06	0.01	1.82
2020	0.07	0.01	2.01

ROG = Reactive Organic Gases
NOx = Nitrogen Oxides
CO = Carbon Monoxide

Source: California Air Resources Board, Forecasted Annual Average Emissions, Sonoma County, 2004.

4.4 NOISE

4.4 NOISE

Noise – Environmental Setting

This section gives background information regarding noise sources and noise exposure in Sonoma County. Included is the methodology used for noise exposure analysis. ***Appendix 7.7 Noise*** further describes how sound is measured, the effects of noise on people, and criteria for acceptable noise exposure. Noise impacts are most closely related to the Noise, Land Use, and Air Transportation Elements of the *Draft GP 2020.*

METHODS USED TO DEVELOP NOISE EXPOSURE INFORMATION

According to the Government Code and General Plan Guidelines, noise exposure contours should be developed in terms of the Day / Night Average Level (L_{dn}) or Community Noise Equivalent Level (CNEL). Both of these descriptors represent the weighted energy noise level for a 24-hour day after the inclusion of a ten dB penalty for noise levels occurring at night between the hours of 10:00 pm and 7:00 am. The CNEL descriptor additionally includes a penalty of about five dB for noise levels occurring during the evening hours of 7:00 pm and 10:00 pm. The CNEL descriptor was developed to quantify aircraft noise. Its use is required when preparing noise exposure maps for airports within the State of California. The CNEL and L_{dn} descriptors are generally considered to be equivalent to each other for most community noise environments within ±1.0 dB. The L_{dn} descriptor is used to quantify noise from the identified major transportation noise sources in the county.

To supplement the L_{dn} noise descriptor, the hourly L_{eq} and L_{max} descriptors have been used to characterize noise levels from measured stationary noise sources. Because many industrial noise sources operate sporadically, the hourly L_{eq} and L_{max} are more useful for predicting noise conflicts from such sources than is the L_{dn}. The L_{dn}, by definition, is a modified average noise exposure over 24 hours. If a noise source operates only a few hours a day, averaging the noise over 24 hours may under estimate its nuisance potential. To address these concerns, noise exposures from non-transportation noise sources have been described in terms of the observed or predicted average and maximum noise levels.

Analytical noise modeling techniques were used to develop generalized noise contours for existing and future conditions. Analytical noise modeling techniques generally use source-specific data, including descriptions of noise-generating equipment or activities, hours of operation, seasonal fluctuations, and average levels of noise from source operations. Analytical methods have been developed for many environmental noise sources, including roadways, railroad line operations, railroad yard operations, industrial plants, and aircraft / airport operations. Such methods will produce reliable results as long as data inputs and assumptions are valid for the sources being studied.

The noise exposure information developed does not include all conceivable sources of industrial or commercial noise within Sonoma County. Rather, it focuses on the existing sources of noise which have been identified by the County as being potentially significant.

Definitions of common noise and planning terms follow.

Community Noise Equivalent Level (CNEL): The average equivalent sound level during a 24-hour day, obtained after addition of approximately five decibels to sound levels in the evening from 7:00 pm to 10:00 pm and ten decibels to sound levels in the night before 7:00 am and after 10:00 pm. As a practical matter, there is usually little difference between the CNEL and the Day / Night Average sound level (see below). For most purposes, they can be used interchangeably.

Day / Night Average Sound Level L_{dn}: The average equivalent sound level during a 24-hour day, obtained after addition of ten decibels to sound levels in the night after 10:00 pm and before 7:00 am (See discussion of CNEL and L_{dn} above).

Equivalent Sound Level L_{eq}: The sound level containing the same total energy as a time varying signal over a given sample period. L_{eq} is typically computed over a 1-hour sample period.

Maximum Sound level L_{max}: The maximum sound level recorded during a noise event.

L_{50}: Sound level that is equaled or exceeded 50 percent of the time during the measurement period.

New Development: Projects requiring land use approval or building permits, but excluding remodeling or additions to existing structures.

Noise-Sensitive Land Use: Residential land uses, transient lodging, schools, libraries, museums, day-care centers, churches, hospitals, and nursing homes.

Outdoor Activity Areas: Patios, decks, balconies, outdoor eating areas, swimming pool areas, yards of dwellings and other areas which have been designated for outdoor activities and recreation.

Sound Level: Except as otherwise specified, all sound levels referred to in this policy document are A-weighted sound pressure levels, in decibels (dB), re: 10^{-6} micropascals. A-weighting de-emphasizes the very low and very high frequencies of sound in a manner similar to the human ear. Most community noise standards utilized A-weighting, as it provides a high degree of correlation with human annoyance and health effects.

Non-Transportation Noise Source: Any fixed or mobile noise source not preempted from local control by existing federal or state regulations. Examples of such sources include industrial and commercial facilities, and vehicle movements on private property.

Transportation Noise Source: Traffic on public roadways, railroad line operations, and aircraft in flight. Control of noise emitted by these individual sources is preempted by existing federal or state regulations. However, the effects of noise from transportation sources may be controlled by regulating the location and design of adjacent land uses, or, in the case of roadways, by providing noise barriers.

Appendix 7.7 Noise further describes how sound is measured, the effects of noise on people, and criteria for acceptable noise exposure. It further provides a reference for use by Sonoma County during the review of documents or proposals that refer to the measurement and effects of noise.

ROADWAYS

The Federal Highway Administration (FHWA) Highway Traffic Noise Prediction Model (FHWA-RD-77-108) was used to develop L_{dn} contours for roadways in Sonoma County. The FHWA model is the analytical method currently favored by most state and local agencies, including Caltrans, for highway traffic noise prediction. The model is based upon reference energy emission levels for automobiles, medium trucks (i.e., two axles) and heavy trucks (i.e., three or more axles), with consideration given to vehicle volume, speed, roadway configuration, distance to the receiver, and the acoustical characteristics of the site. The FHWA model was developed to predict hourly L_{eq} values for free-flowing traffic conditions, and is generally considered to be accurate within $\pm$1.5 dB. The model assumes a clear view of traffic with no shielding at the receiver location. To predict L_{dn} values, it is necessary to determine the hourly distribution of traffic for a typical day and adjust the traffic volume input data to yield an equivalent hourly traffic volume. The Calveno [1] traffic noise emission curves were used as recommended by Caltrans because they more accurately calculate noise levels generated by California traffic.

Existing traffic volume data were obtained from Caltrans and the Sonoma County Department of Transportation and Public Works. Truck volume estimates were based on the data provided by Caltrans, and on consultant observations of relative truck mix on county roads. The day / night distribution of traffic was based on statewide trends and files from the office of Brown-Buntin Associates (EIR noise consultant). Vehicle speeds assumed for traffic noise modeling were the posted vehicle speeds.

Exhibit 7.7-5 and **Exhibit 7.7-6** in ***Appendix 7.7 Noise*** show the projected distances from roadway center lines to the existing 60 and 65 dB L_{dn} contours for Sonoma County state highways and for county roads. The FHWA model input assumptions are available on file at the Sonoma County PRMD. [2] Noise-sensitive land uses located within these contours are potentially affected by traffic noise in accordance with the land use compatibility criteria of the *Draft GP 2020* Noise Element. In the impact section below, traffic noise projections associated with the *Draft GP 2020* are compared to the existing traffic noise projection.

MAJOR INDUSTRIAL NOISE SOURCES

The production of noise is an inherent part of many industrial, commercial, and agricultural processes, even when the best available noise control technology applied. Noise production within industrial or commercial facilities is controlled indirectly by federal and State employee health and safety

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1 The Calveno (California Vehicle Noise Emission Level) noise emission factors were published by Caltrans in 1984, based upon more than 3,000 noise measurements. The Calveno curves replace the federally-recommended noise emission curves in the FHWA model. Caltrans required use of the Calveno noise emission factors for its studies by memorandum dated February 28, 1985.

2 Sonoma County Permit and Resource Management Department, 2550 Ventura Avenue, Santa Rosa, CA 95403-2829

regulations (i.e., OHSA and Cal-OSHA), but exterior noise emissions from such operations have the potential to exceed locally acceptable standards at nearby noise-sensitive land uses.

To describe typical noise levels associated with industrial noise sources in Sonoma County, several major industrial sources were identified by the County staff for study. Noise exposure information for those sources was developed from operational data obtained from source operators (when available), noise level measurements conducted at reference locations around the noise source, and file information collected by Brown-Buntin Associates, Inc. (EIR noise consultant) for similar sources. Only existing noise levels are described since there are too many variables in permitted activities and unknown future economic conditions to predict future noise exposure with reliability.

The following discussions provide generalized information concerning the relative noise impacts of the identified sources, and they identify specific noise sources which should be considered in the review of development proposals where potential noise conflicts could result. Not all industrial noise sources in Sonoma County are discussed. Unidentified industries or other major noise sources may exist, which could generate significant noise levels and result in noise-related land use conflicts.

Predicted distances to the 45 dBA and 50 dBA hourly L_{eq} noise contours were prepared for major stationary noise sources where it was determined that such contours would be located off the property occupied by the source. The generalized contours should be used as a screening device to determine when potential noise-related land use conflicts may occur, and when site-specific studies may be required to properly evaluate noise at a given noise-sensitive receiver location.

Mineral Resource Extraction and Processing

The development of mineral resources, which involves the use of noise-producing machinery, is subject to the policies of the *Aggregate Resources Management Plan* (ARM Plan). [3] The ARM Plan indicates where mineral resources may be mined. Those areas should be considered as potential noise sources during review of proposed nearby noise sensitive uses. Noise sources associated with mineral resource extraction may include the use of heavy equipment, shakers, screens, and asphalt burners. In addition, blasting may occur at hillside quarries.

Chapter 26c of the Sonoma County Code regulates surface mining and reclamation, and includes noise standards for mining operations. The noise standards may be made more stringent when warranted by local circumstances.

There are over 20 different mining operators in Sonoma County, and a greater number of mining and processing sites. The sizes of the operations vary; some may produce less than 5,000 tons per year while others may produce up to 2,000,000 tons per year.

The noise landscape at mining sites may include stationary plant noise, earthmoving equipment noise, truck noise, back-up beepers, and blasting as well as other ancillary activities, such as recycling, asphalt, and cement batch plants. Noise-producing activity from mining and aggregate processing is greatest in the late summer and early fall when construction activity is at its highest level.

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3 *Sonoma County Aggregate Resources Management Plan and Environmental Impact Report,* EIP & Associates, November 1994.

Mineral extraction and aggregate processing operations are frequently sources of noise complaints, and may have a greater potential than other land uses to disturb neighbors for the following reasons:

- They are located outdoors rather than in a building;
- They are often located in rural areas with low background noise levels;
- They often start in the early morning when residents are more sensitive to noise disturbances. For example, facility gates may open at 6:00 am, but some activities and trucking may begin earlier;
- Night time operations are becoming more frequent and necessary to supply night time construction projects on highways;
- Heavy equipment and truck noise, e.g., noise from engines, back-up beepers, and "Jake" brakes can be heard over long distances;
- Blasting may be used to quarry materials;
- Noise from mining is not always constant and broadband, but is often punctuated and irregular with occasional noise "spikes", making it conspicuous even when the average sound level is within acceptable limits;
- Some operations are vested, and do not have to meet Noise Element standards. Noise from these operations may already exceed the Noise Element standards, and increased production levels allowed by vested rights could result in greater noise generation; and
- Truck haul routes often pass by residences and through communities.

Blue Rock Quarry

This facility is located at 7888 Highway 116 in Forestville. The facility operates Monday through Friday from 7:00 am to 4:30 pm. Activities include the processing and loading of gravel, serving anywhere between one and 100 semi-trucks per day. Noise producing equipment operated at the facility includes conveyors, shakers, rock crushers, and loaders.

Noise measurements were taken from a location approximately 30 feet across the roadway from the facility's main entry gate. The largest contributor to the noise environment was the roadway automobile noise. Measured noise levels at the site were a L_{50} of 63.1 dB and an L_{max} of 67.9 dB (auto traffic). The approximate distances to the 45 and 50 dB hourly L_{50} contours are 241 and 135 feet, respectively, measured from the entry gate.

Canyon Rock

This facility is located at 7525 Highway 116 in Forestville, approximately one-half mile east of Blue Rock Quarry. The facility operates Monday through Friday from 7:00 am to 5:00 pm and Saturdays from 7:00 am to 12:00 noon (sometimes later). Activities include the processing and loading of sand, concrete, rocks, and gravel. Crushing and blasting operations also occur. Noise producing equipment operated at the site includes crushers, screeners, loaders, dozers, and heavy semi-trucks. This facility is a larger scale operation than the Blue Rock Quarry facility.

Extensive noise measurements were performed in 2003 for an EIR for the expansion of the Canyon Rock Quarry. Five sites in the range of 1,000 feet to 2,500 feet from the quarry operations were monitored continuously for several days. The average measured L_{50} noise levels when the quarry was in operation ranged from 39 dB at 2,500 feet to 59 dB at 1,000 feet. Based upon those data, the distance to the 45 dB L_{50} contour would be about 1,250 feet from the center of operations, and the 50 db L_{50}contour would lie about 700 feet from the center of operations.

Shamrock Materials

This facility is located at 30022 Levee Road in Cloverdale, and it operates Monday through Friday from 6:00 am to 4:30 pm, and Saturdays from 7:00 am to 12:00 pm. Activities include truck loading, gravel screening, and ready-mix concrete operations. Noise producing equipment includes screeners, loaders, and heavy semi-trucks.

Noise measurements were taken July 17, 2002, approximately 100 feet from the southwest corner of the facility property line along the river. Measured noise levels were 67.0 dB L_{50} and 93.8 dB L_{max}. The approximate distances to the 45 and 50 dB L_{50} contours are 1,250 and 700 feet, respectively, measured from the property line.

Other Industrial Operations

Redwood Empire Remanufacturing

This facility is located at 26800 Asti Road in Cloverdale. The facility operates Monday through Friday (and some Saturdays) from 6:00 am to 5:00 pm. Activities include lumber remanufacturing, sizing, and sawing. Heavy truck loading and unloading also occurs. Noise producing equipment operated at the site includes saws, planers, standard lumber working equipment, and heavy semi-trucks.

Noise measurements were taken from approximately 70 feet across the roadway from the facility's main entry gate. The facility was in operation at the time of the measurements on July 17, 2002. However, the main contributor to the noise environment was the freeway traffic on US 101. Measured noise levels at the site were a L_{50} of 59.3 dB and an L_{max} of 62.6 dB. The approximate distances to the 45 and 50 dB hourly L_{50} contours are 363 and 205 feet, respectively, measured from the main entry gate.

Reuser Inc

This facility is located at 370 Santana Drive in Cloverdale. This facility operates Monday through Friday from 7:30 am to 5:00 pm. Reuser is a bulk landscape supply company. Typical operations include loading and unloading heavy trucks, movement of large amounts of landscape materials, and grinding of materials. Noise producing equipment at the location includes dump trucks, portable hogs, grinders, and heavy semi-trucks loading and offloading.

Noise measurements were taken approximately 60 feet from the southeast corner of the facility property line across the roadway (Santana Drive), on July 17, 2002. Measured noise levels at the site were an L_{50} of 47.0 dB and an L_{max} of 93.8 dB. A neighboring wine tank manufacturing business to the north of the Reuser facility, Modern Stainless Steel, generates an equal amount of noise. Banging from the wine tank manufacturer generated the L_{max} reading during monitoring. The approximate distances to the 45 and 50 dB L_{50} contours are 375 and 210 feet, respectively, measured from about 250 feet inside the entry gate.

Exhibit 4.4-1 summarizes the sound levels measured at the above Sonoma County industrial sites, and the distances to the 45 and 50 dB L_{50} hourly noise level contours.

Exhibit 4.4-1
Noise Levels From Sonoma County Industrial Sites

Location	Date	Distance to Noise Source (feet)	Measured Sound Level (dB)		Distance to L_{50} Contours (feet)	
			L50 / Leq	Lmax	50 dB	45 dB
Blue Rock Quarry	7/18/2002	30	63.1	67.9	135	241
Canyon Rock	2003	1,900	47.0	58.0	700	1,250
Shamrock Materials	7/17/2002	100	67.0	93.8	700	1,250
Redwood Empire Remanufacturing	7/17/2002	70	59.3	62.2	205	363
Reuser Inc.	7/17/2002	300	47.0	93.8	210	375

Source: Brown-Buntin Associates, Inc

Wineries

Noise produced at wineries can be of concern during the "crush" season, when trucks deliver grapes to the wineries and when fork lifts transfer grapes into the wineries. Bird control propane ignition guns and electronic alarms are also used during this time. In addition it is becoming more common to conduct harvest activities at night. During the winter noise results from the use of frost protection wind turbines at night, and sometimes during the day. Irrigation pump sounds during dry weather cause noise. The occasional use of gopher control compression guns is strongly discouraged by the Commissioner due to the significant vibrations and noise produced. [4]

These and other related activities may create noise levels above and different from the ambient noise environment. File data indicate that average hourly noise levels from properly muffled vehicles and equipment operating at wineries will be less than 60 dB at a distance of 300 feet from the source. Nearby residents may complain about the noise from these activities. The Commissioner's office has no official jurisdiction, but it attempts to informally mediate noise complaints through education of all parties to the dispute. Noise impacts from normal winery operations are not usually considered to be significant because there are often solutions available to reduce noise, or the activity causing the noise is short in duration.

However, wineries may also host occasional festivals and concerts, which may include the use of amplified sound systems. These activities can produce unacceptable noise levels, and the associated traffic problems may heighten public concern about the noise-producing activity. Therefore, when proposals are submitted to PRMD to allow wineries to conduct special events unrelated to the production of wine, noise is an important factor in the environmental review.

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4 Nichols • Berman communication with Lisa Correia, Chief Deputy Agricultural Commissioner, Office of the Agricultural Commissioner, January, 2003.

Geothermal Development

Geothermal power plants are located in the Geysers area. The normal operation of geothermal power plants produces relatively constant noise levels from cooling towers, with occasional steam releases. The greatest potential for noise impacts occurs during site development, when drilling may result in an uncontrolled steam release, or when it is necessary to "blow out" steam lines during construction or maintenance. Temporary mufflers may be used to reduce steam release noise during construction, and permanent rock mufflers are frequently employed for routine steam releases during site operation. The remote location of the Geysers area, and the absence of nearby residential areas, limits the potential for noise-related land use conflicts in Sonoma County. In addition, the County has set a noise limit of 65 dB at the boundaries of leaseholds.

RAILROADS

The longest railroad route in Sonoma County is the NWP which roughly parallels US 101. The tracks from Novato to Healdsburg are owned by the SMART District; the tracks north of Healdsburg are owned by NCRA. Neither SMART nor NCRA is operating rail service at this time. Therefore, noise from railroad operations is not currently a factor in land use compatibility in Sonoma County.

However, it may be anticipated that the railroad lines in Sonoma County will be returned to service at some time in the future. The SMART District has proposed a passenger rail project on the NWP and intends to put a sales tax measure on the ballot in November 2006 to help fund the project. The project is currently undergoing environmental review. NCRA also has plans to resume freight service on the line. Development proposals adjacent to the railroad tracks should consider the potential impacts of noise due to passing locomotives and rail cars, as well as the use of warning horns within about 1,000 feet of crossings. Noise levels associated with rail operations will vary depending on the typeof vehicle used and whether noise alternative measures are incorporated.

AIRPORTS

Noise exposure contours for the public use airports in the county have been prepared by the Sonoma County Airport Land Use Commission (ALUC). [5]

Noise exposure contours for airports use the Community Noise Equivalent Level (CNEL) metric to be consistent with the requirements of the State of California Airport Noise Regulations (CCR Title 21), and to be consistent with the land use compatibility planning guidelines adopted by the ALUC. The 55, 60, and 65 dB CNEL contours have been shown in the Comprehensive Airport Land Use Plan (CALUP).

The CALUP includes a noise compatibility criterion of 60 dB CNEL. This criterion is consistent with the transportation noise standards recommended for the Noise Element. Although the California Airport Noise Regulations require only that an airport ensure compatible land use within the 65 dB CNEL contour, the ALUC recommendations recognize the rural nature of Sonoma County, and the fact that ambient noise levels are lower in the county than in urbanized jurisdictions.

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5 *Sonoma County Comprehensive Airport Land Use Plan* (CALUP), January, 2001.

INFINEON RACEWAY

The Infineon Raceway (formerly the Sears Point Raceway) is located on Highway 121, north of the intersection of Highways 37 and 121. The race track has been in use for many years, and has been the subject of noise concerns for the nearest neighboring residences, which are few and relatively distant. [6]

Typical racing activities include routine daily and weekend use by the Russell Racing School, testing by NASCAR and individual race teams, and weekend events for NASCAR, the American Le Mans Series (ALMS), Sports Car Club of America (SCCA), the American Motorcyclists Association (AMA), the National Hot Rod Association (NHRA), and other auto and motorcycle race sanctioning bodies.

Noise related activities at the race track are closely regulated by the conditions of approval for the current land use permit. One condition required continuous monitoring of noise at three locations for a period of 18 months. One of these monitoring locations was near Turn 7 on the race track property. The other noise monitoring sites were located at the Donnell / Faggiolli ranch and at the Lilly residence, northeast and northwest of the race track respectively.

The noise monitoring results were summarized on a quarterly basis in a report to Sonoma County Permit and Resource Management Department. The report includes the measured noise levels, the raceway schedule, and an analysis of whether the race track activity appeared to cause the measured noise levels to exceed the standards of the current Sonoma County Noise Element.

As a result of this noise monitoring study, the raceway installed a permanent noise monitor near the finish line, and various noise limitation standards have been developed for racing vehicles in order to better control raceway noise at the source. Permanent and continuous recording of noise levels at the finish-line sensor will allow raceway noise levels to be monitored over time, and will be used to prevent raceway noise levels from increasing in the future.

Many apparent exceedances of the noise standards at the residential receiver locations were difficult to reliably ascribe to race track activity. Furthermore, it appears that atmospheric effects were associated with exceedances during afternoon hours when the noise levels at the race track would not ordinarily be expected to exceed the standard.

The noise level data do indicate, however, that noise-sensitive land uses would not be compatible in close proximity to the race track. As a result, future development proposals within the general area should be carefully evaluated for noise compatibility.

SOLID WASTE DISPOSAL

Noise associated with solid waste disposal and transfer stations is produced by the use of engine-powered equipment and by heavy truck movements. During operating hours, landfill operations involve the use of bulldozers, scrapers, compactors, loaders, and watering trucks. At transfer sites, noise is produced by the use of loaders and transient heavy trucks. The access roads for landfills and

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6 The recent upgrading of the race track was the subject of an extensive County land use approval process, including an EIR.

transfer stations usually experience a greater proportion of heavy truck traffic than otherwise similar roads. As a result, areas containing roads accessing solid waste facilities may experience higher traffic noise levels than other areas of the county.

Solid waste operations are typically in use only during daytime hours, so the noise effects are usually limited to that time period. Landfill cover and maintenance activities may also occur during early morning and evening hours, when public use is not allowed.

Sonoma County Central Landfill

The Sonoma County Central Landfill is located in an agricultural area southwest of Cotati. The landfill is open from 7:00 am to 4:00 pm. Engine-powered equipment used at landfills includes bulldozers, compactors, loaders, scrapers, and water trucks. This equipment moves among different areas of the landfill as new working faces are placed into operation. Back-up beepers and engines are the major noise sources. As in the past, noise from this landfill is barely audible at the nearest homes, though noise from truck traffic on the access roads is pronounced. There is also a generator building housing eight generators, which do not appear to produce audible noise at the nearest homes. Two new gas-cycle engine-powered generators are being placed into service outside the north side of the existing generator building. These units are subject to noise standards intended to ensure that the noise level of generators at the nearest home does not exceed 45 dB. At this time, the median noise level produced by landfill equipment operation is in the range of 50-55 dB at the nearest residential property line.

Healdsburg Transfer Station

The Healdsburg Transfer Station replaced the landfill at the same site, near the intersection of Alexander Valley Road and Healdsburg Avenue. The transfer station is open daily from 8:00 am to 4:00 pm. Noise-producing activity at the transfer station includes truck traffic, use of a loader and bulldozer at the tipping floor, and movement of transfer trucks. The refuse is moved into piles by a rubber-tired loader, and compacted by the bulldozer. Back-up beepers and engines are the major noise sources. At this time, it does not appear that noise from this facility exceeds the noise standards at the nearest residences.

EXISTING NOISE LEVELS

A community noise survey was conducted to document noise exposure in representative areas of the county containing noise-sensitive land uses. The following noise-sensitive land uses have been identified for the purpose of this survey:

- All residential uses,
- Schools,
- Long-term care medical facilities, such as hospitals, nursing homes, etc.,
- Churches, and
- Libraries.

Noise monitoring sites were selected to be representative of typical conditions where such uses are located. A total of 22 monitoring sites were selected to document existing noise levels at these locations during July 2002. Continuous noise monitoring was employed at eight of the sites. The noise measurement sites are shown by **Exhibit 4.4-2** and the data are shown in **Exhibit 4.4-3**.

Exhibit 4.4-2
Noise Measurement Locations

Figure 4.4-3
Summary of Measured Noise Levels And Estimated Day-Night Average Levels (L_{dn}) In Areas Containing Noise Sensitive Land Uses

Site No.	Description	Sound Levels, dB				
		Day		Night		L_{dn}
		L_{eq}	L_{max}	L_{eq}	L_{max}	
1[a]	8210 Jaybird Way, Windsor	49.4	68.3	43.0	57.4	51.1
2 [a]	91 Geyser Ridge, Geyserville	58.5	73.3	53.5	73.3	61.1
3	Lake Sonoma Picnic Area	42.8	55.4	38.2	50.7	45-50
4	Annapolis post office	46.9	64.8	31.0	46.6	45-50
5	Black Point Beach parking area	45.9	61.3	52.0	69.5	50-55
6	Stewart's Point near store	58.8	78.5	45.4	64.1	50-55
7	Salt Point State Park	42.8	53.5	35.6	52.9	45-50
8	Fort Ross State Park	51.5	58.0	48.8	54.1	50-55
9	Graton Post Office	41.7	56.8	58.8	77.2	45-50
10 [a]	Johnson's Beach, Guerneville	52.2	69.7	46.8	66.8	54.5
11	Jenner Fire Station	43.1	55.8	30.8	45.0	40-45
12	Bodega Bay School	36.5	44.5	29.9	46.2	40-45
13 [a]	St. Theresa Church, Bodega Bay	51.9	74.2	43.0	57.9	52.3
14 [a]	Emma Herbert Mem. Park, Bloomfield	47.2	61.1	39.0	54.3	48.0
15	Bennett Valley Grange Hall	45.0	51.1	39.9	56.2	45-50
16	Kenwood Youth Park	44.1	53.3	33.8	44.4	40-45
17	Gibson & Hill, Glen Ellen	45.0	65.3	37.5	45.0	45-50
18 [a]	Glen Ellen	44.1	66.3	38.2	66.1	46.1
19	Boyes Hot Springs	49.2	67.8	43.2	65.0	50-55
20 [a]	Penngrove School	52.2	73.6	46.1	62.6	54.1
21 [a]	3276 Fulton Road, Mark West Springs	52.6	73.5	45.6	60.5	54.0
22	Meacham Road	44.1	53.3	33.8	44.4	40-45

[a] 24 Hour Monitoring Site

Source: Brown-Buntin Associates, Inc

Noise level data collected during continuous monitoring included the average (L_{eq}), maximum (L_{max}) and minimum (L_{min}) noise levels. Noise level data collected during the community noise survey are summarized in **Exhibits 4.4-4** through **4.4-11**. Hourly L_{eq} values shown in these exhibits are representative of energy average sound levels, and are very sensitive to single events such as vehicle passages. L_{max} and L_{min} values represent the maximum and minimum values measured each hour.

The community noise survey results indicate that typical noise levels in noise-sensitive areas range from 45 to 55 dB L_{dn}. These are relatively low noise levels, and are typical of small communities and rural areas. In more developed areas, increased local traffic will result in higher noise levels, in the range of 55 to 65 dB L_{dn}.

Exhibit 4.4-4
Measured Hourly Noise Levels, Windsor Area, July30-31, 2002

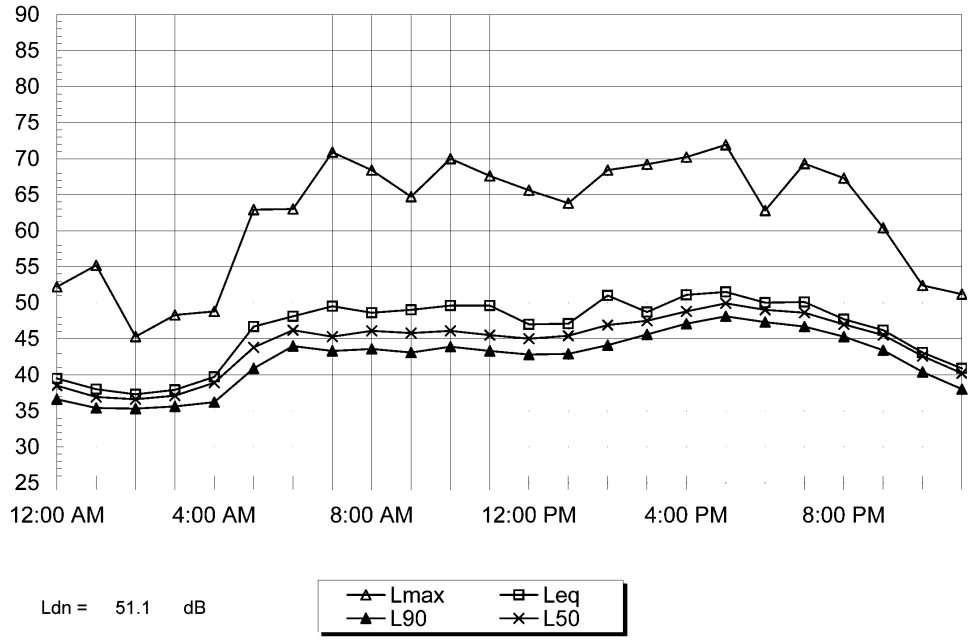


Exhibit 4.4-5
Measured Hourly Noise Levels, Geyserville Area, August 2-3, 2002

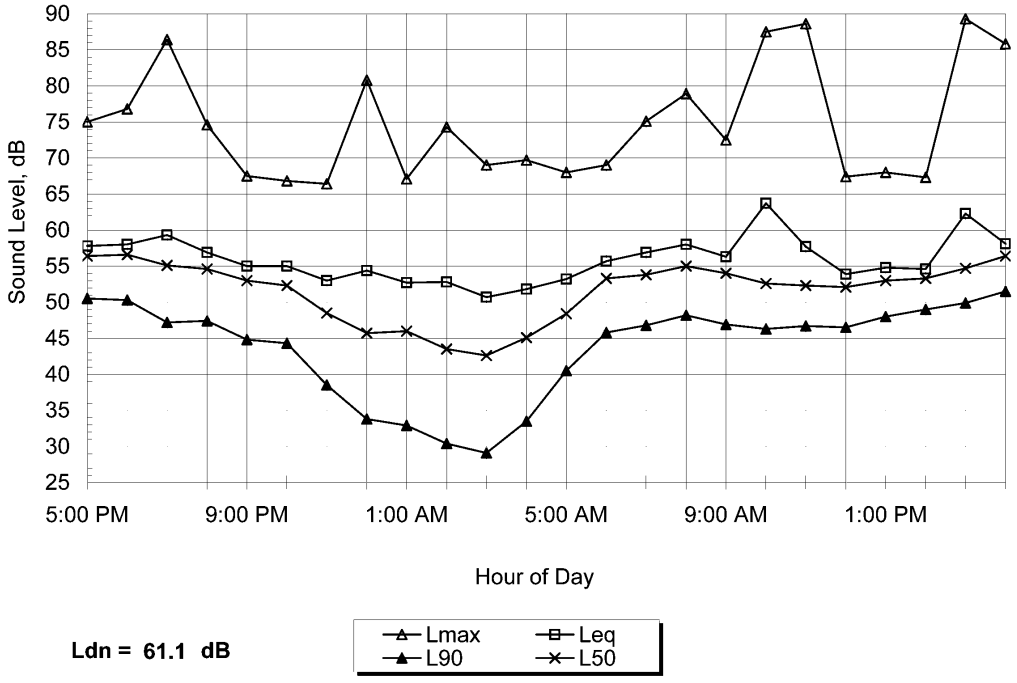
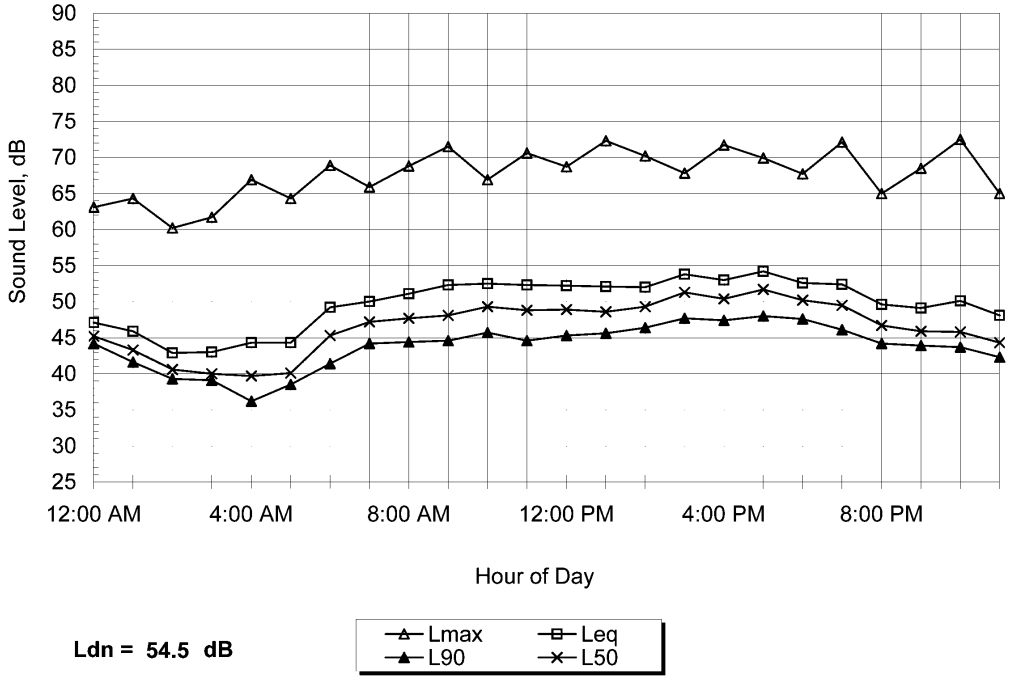
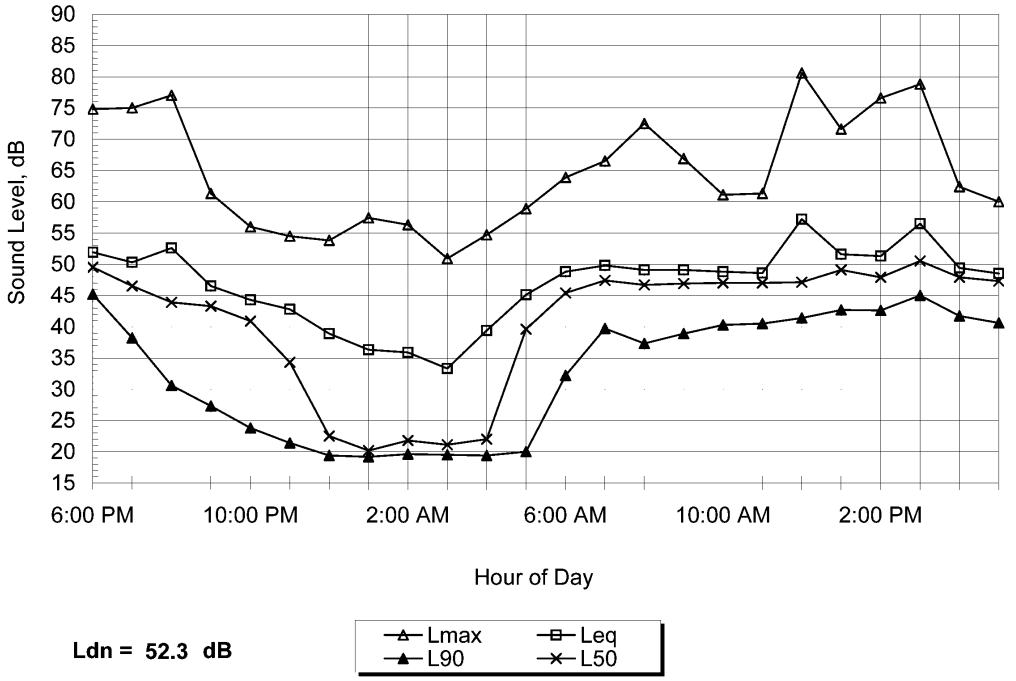


Exhibit 4.4-6
Measured Hourly Noise Levels, Guerneville Area, August 1, 2002



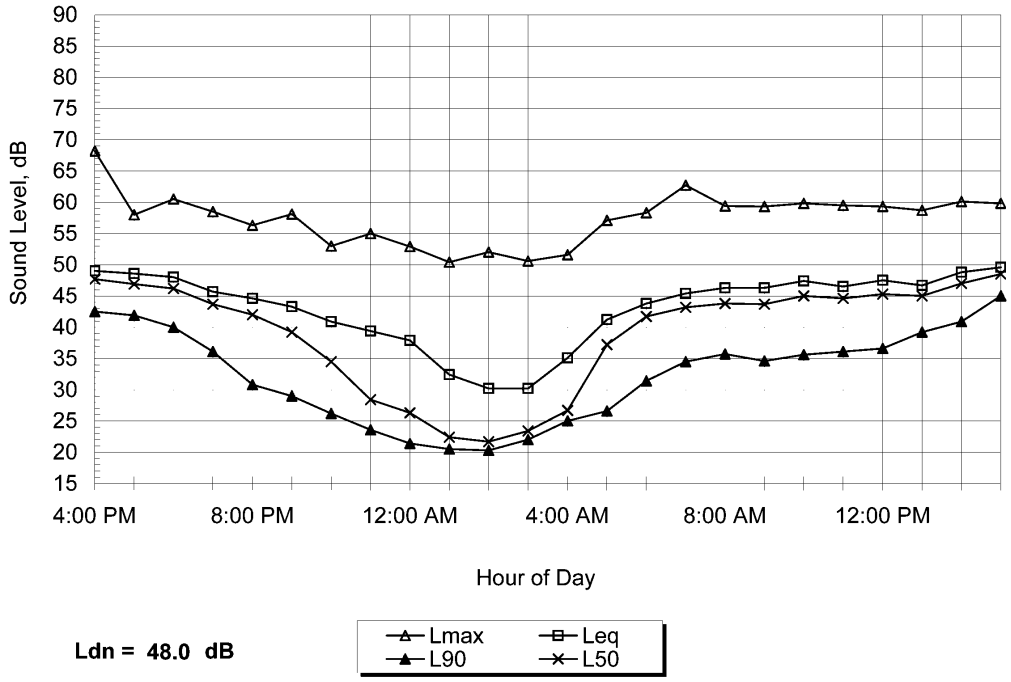
Ldn = 54.5 dB

Exhibit 4.4-7
Measured Hourly Noise Levels, Bodega Bay Area, July 31-August 1, 2002



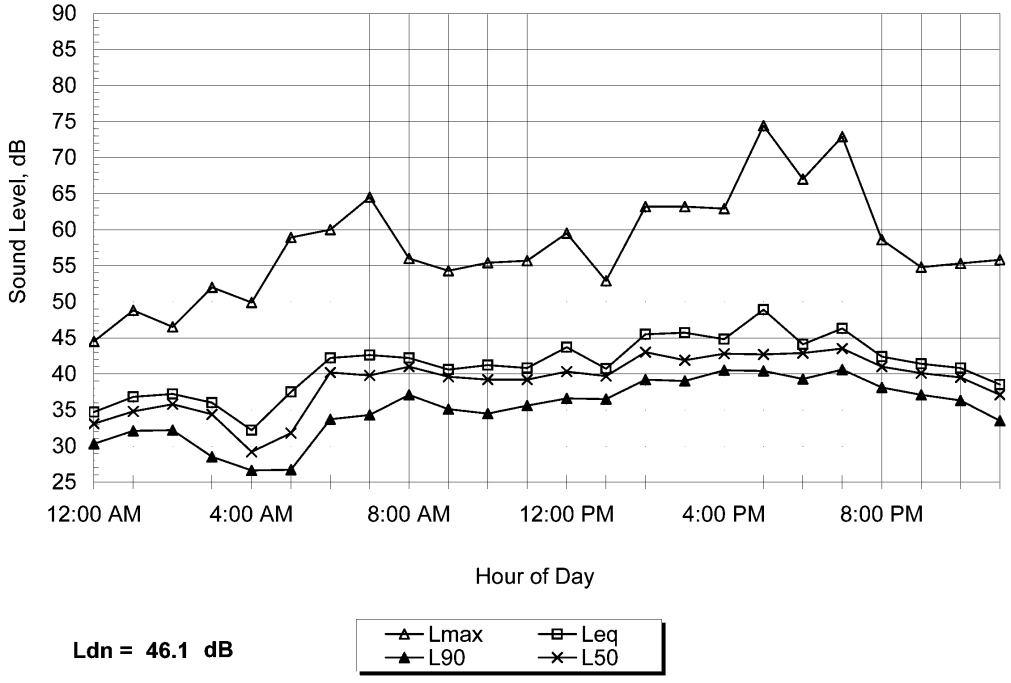
Ldn = 52.3 dB

Exhibit 4.4-8
Measured Hourly Noise Levels, Bloomfield Area, July 31-August 1, 2002



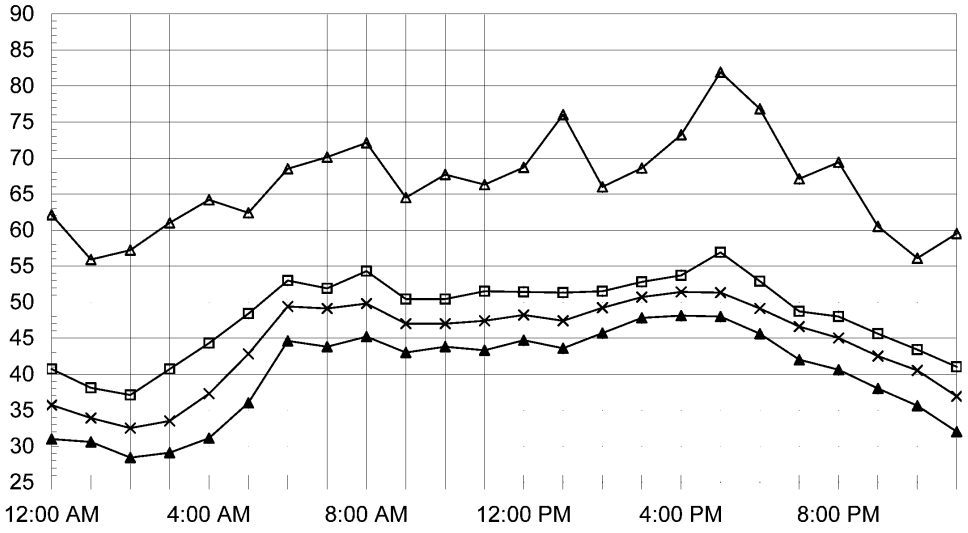
Ldn = 48.0 dB

Exhibit 4.4-9
Measured Hourly Noise Levels, Glen Ellen Area, July 30, 2002



Ldn = 46.1 dB

Exhibit 4.4-10
Measured Hourly Noise Levels, Penngrove Area, July 30, 2002



Ldn = 54.1 dB

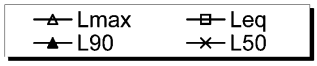
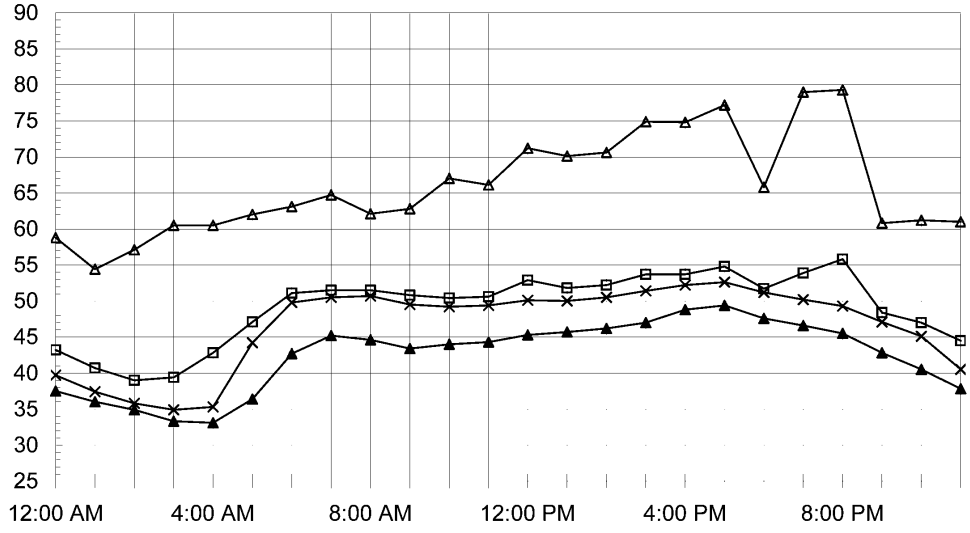
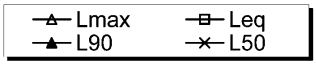


Exhibit 4.4-11
Measured Hourly Noise Levels, Mark West Springs Area, July 30, 2002



Ldn = 54.0 dB



Noise – Regulatory Setting

COUNTY REGULATIONS

The County's *Aggregate Resources Management Plan* (ARM Plan) designates locations where mineral resources may be mined; these areas are potential noise sources and should be considered during permit review for new development. Noise from surface mining and reclamation is regulated by Chapter 26c of the Sonoma County Code.

The County's *Comprehensive Airport Land Use Plan* (CALUP) contains noise exposure contours for the public use airports in the county. These contours use the Community Noise Equivalent Level (CNEL) metric to be consistent with the both the requirements of the State of California Airport Noise Regulation (CCR Title 21) and the land use compatibility planning guidelines adopted by the County's Airport Land Use Commission (ALUC). The ALUC includes a lower noise compatibility criterion of 60 dB CNEL, recognizing that county ambient noise levels are lower in the county than urbanized jurisdictions.

STATE REGULATIONS

State employee health and safety regulations developed and enforced by the California Occupational Safety & Health Administration (CAL-OSHA) regulate the noise production within but not outside industrial or commercial facilities.

FEDERAL REGULATIONS

Under the Occupational Safety and Health Act of 1970 (29 U.S.C. § 651 et seq.), the Department of Labor, Occupational Safety and Health Administration has adopted regulations (29 C.F.R. § 1910.95) designed to protect workers against the effects of occupational noise exposure. These regulations list permissible noise exposure levels as a function of the amount of time during which the worker is exposed. The regulations further specify a hearing conservation program that involves monitoring the noise to which workers are exposed, assuring that workers are made aware of overexposure to noise, and periodically testing the workers' hearing to detect any degradation.

There are no federal laws governing off-site (i.e., community) noise.

Noise – Significance Criteria

The noise analysis uses criteria from the *State CEQA Guidelines.* According to these criteria, the project would have a significant noise impact if it would:

- Result in the 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;

- Result in the exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels;

- Result in a substantial permanent increase in ambient noise levels in the project vicinity above existing levels without the project;

- Result in a substantial temporary or periodic increase in ambient noise levels in the project vicinity above existing levels without the project;

- Expose people residing or working in the project area to excessive noise levels for a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport; or

- Expose people residing or working in the project area to excessive noise levels for a project within the vicinity of a private airstrip.

SIGNIFICANT CHANGES IN AMBIENT NOISE LEVELS

Some guidance as to the definition of a substantial permanent increase in ambient noise levels in the project vicinity above existing levels throughout the project is provided by the 1992 findings of the Federal Interagency Committee on Noise (FICON), which assessed the annoyance effects of changes in ambient noise levels resulting from aircraft operations. The FICON recommendations are based upon studies that relate aircraft and traffic noise levels to the percentage of persons highly annoyed by the noise. Annoyance is a summary measure of the general adverse reaction of people to noise that generates speech interference, sleep disturbance, or interference with the desire for a tranquil environment.

The rationale for the FICON recommendations is that it is possible to consistently describe the annoyance of people exposed to transportation noise in terms of L_{dn}. The changes in noise exposure that are shown in **Exhibit 4.4-12** are expected to result in equal changes in annoyance at sensitive land uses. Although the FICON recommendations were specifically developed to address aircraft noise impacts, they are used in this analysis to define a substantial increase in traffic noise.

Exhibit 4.4-12
Measures of Substantial Increase for Transportation Noise Exposure

Ambient Noise Level Without Project (Ldn)	*Significant Impact Assumed to Occur if the Project Increases Ambient Noise Levels by:*
<60 dB	+ 5 dB or more
60-65 dB	+3 dB or more
>65 dB	+2 dB or more

Source: FICON as applied by Brown-Buntin Associates, Inc

The significance criteria listed in **Exhibit 4.4-12** are applied in the analysis of increased traffic noise (see *Impact 4.4-1 Increased Traffic Noise*).

Noise – Impacts and Mitigation Measures

As discussed in the setting section above, the Federal Highway Administration (FHWA) Highway Traffic Noise Prediction Model (FHWA-RD-77-108) was used to predict existing and future traffic noise levels for roadways in Sonoma County. Data regarding existing and future traffic volumes were entered into the FHWA model, which then predicted an L_{dn} value at a distance of 50 feet from the roadway centerline. This distance was selected to represent the typical setback of homes from roadways.

Impact 4.4-1 Increased Traffic Noise

Land uses and development consistent with the Draft GP 2020 would result in increased traffic which in turn would result in a substantial increase in noise along certain roadway segments. This would be a significant impact. ***(S)***

Vehicular traffic is the largest contributor to noise levels in unincorporated Sonoma County. With land uses and development consistent with the *Draft GP 2020*, traffic noise would increase in many areas. **Exhibit 7.7-7** in ***Appendix 7.7 Noise*** lists the predicted traffic noise levels at a distance of 50 feet from the centerlines of the state highways and major county roads in Sonoma County, for both existing and future (i.e., *Draft GP 2020*) conditions. This exhibit also lists the predicted distance from the roadway centerline to the 60 dB L_{dn} contour for *Draft GP 2020* conditions.

Based on **Exhibit 7.7-7** in ***Appendix 7.7 Noise***, **Exhibit 4.4-13** lists the roadway segments that would experience increases in traffic noise that would exceed the noise significance criteria listed in **Exhibit 4.4-12**. This determination was made by calculating the difference between the predicted traffic noise levels along each roadway for the existing and the *Draft GP 2020* conditions, comparing the difference to the existing noise level, and determining whether the increase would be significant based on the criteria described by **Exhibit 4.4-12**.

Exhibit 4.4-13
Roadways with Predicted Significant Increases in Traffic Noise

Roadway	*Segments*
Highway 37	Junction Highway 121 North
US 101	Windsor River Rd to Central Cloverdale / Citrus Fair Dr
Highway 116	Adobe Rd to Arnold Dr
Airport Blvd	E/ Skylane to W/ Faught Rd
Bennet Valley Rd	W/ Grange Rd to W/ Warm Springs Rd
Crane Canyon Rd	E/ Petaluma Hill Rd to E/ Inverness Ave
Dry Creek Rd	N/ Lytton Springs Rd
Fulton Rd	S/ River Rd to N/ River Rd
Grange Rd	S/ Bennet Valley Rd
Leveroni Rd	E/ Arnold Dr to E/ Harrington
Mark West Springs Rd	E/ US 101 to E/ Michele Way
Mountain View Ave	E/ Santa Rosa Ave
Old Redwood Hwy	N/ Mendocino to N/ East Railroad Ave
Petaluma Blvd South	N/ US 101 S/B Off Ramp
Petaluma Hill Rd	N/ Adobe Rd to N/ Snyder Ln
Rohnert Park Expwy	E/ Stony Point Rd to W/ Petaluma Hill Rd
Santa Rosa Ave	S/ Horn Ave to N/ East Robles Ave
Skylane Blvd	N/ Airport Blvd
Stony Point Rd	N/ Highway 116 to N/ Millbrae Ave
Todd Rd	E/ Standish Ave
Warm Springs Rd	N/ Henno Rd

Source: Brown-Buntin Associates, Inc

The Draft GP 2020 includes policies which, if adopted and implemented, would reduce the impact of the increase of traffic noise on new development. Policy **NE-1b** would require the avoidance of noise sensitive land uses in areas where the existing or projected exterior noise levels exceed 60 dB L_{dn}, 60 dB CNEL or the standards in Table NE-2 unless effective measures are included to reduce noise levels. Furthermore, this policy would require that the noise level due to transportation noise sources be reduced to 60 dB L_{dn} in outdoor activity areas (with some exceptions), and that the interior noise levels shall not exceed 45 dB L_{dn} or 45 dB L_{eq}, depending on the affected land use. Policy **NE-1d** would require that noise analyses for new developments consider future traffic or transit conditions in arriving at the predicted future noise levels affecting the project.

Goal **NE-2** of the *Draft GP 2020* would be to confine the noise impacts from transportation facilities (e.g., roads, rail operations, and aircraft overflights) to the smallest feasible land area and to assure that development would be compatible with the level of noise exposure. Policy **NE-2b** would encourage

the installation of noise barriers along roadways in non-industrial urban areas where an exterior noise level of 65 dB L_{dn} or more occurs and residence or other noise sensitive uses exist.

The Noise Element of the *Draft GP 2020*, however, contains no other specific provisions to mitigate noise impacts on existing noise sensitive uses that would be the result of future changes in traffic volumes or of roadway improvement projects. Noise impacts on existing sensitive uses due to traffic caused by future development could be minimized by requiring appropriate mitigation for new land development projects that significantly affect traffic volumes. Similarly, mitigation could be provided for noise impacts caused by new roadways or roadway improvement projects as part of the environmental review process. However, there is currently no mechanism available to mitigate growth-induced increases in traffic noise on a county-wide basis. This would be a significant impact.

In most cases, the only available and appropriate means to mitigate potential impacts that may result from traffic noise increases would be the construction of noise barriers between the road and the impacted land use. Where feasible, the construction of noise barriers is an effective measure to reduce the impact from traffic noise. A noise barrier may be a masonry wall, an earthen berm, or a combination of the two. The height of the barrier would depend on the noise level it is required to mitigate, which in turn is a function of the distance between the road and the impacted land use. The feasibility of implementing this measure would depend on:

- Funding to construct the barrier;
- Physical constraints that may not allow a barrier to be built; and
- The County's ability to impose mitigation requirements on road projects or land uses in other jurisdictions. For example, several of the impacted roads are State Highways under Caltrans' jurisdiction. Sonoma County has no authority to require construction of noise barriers along these State highways.

Policy **NE-2b** would encourage the installation of sound barriers in specified circumstances. However, it would apply only to non-industrial urban areas and would not address other significant noise sensitive land uses that may exist in other areas, such as hospitals and schools.

Mitigation Measure 4.4-1 Revise Policy **NE-2b** to encourage sound barriers along roadways in areas where significant noise sensitive land uses, such as hospitals and schools, exist. Revise **Policy NE-2b** as follows:

> **Policy NE-2b**: Encourage installation of sound barriers along roadways in non-industrial urban areas where an exterior noise level of 65 dB Ldn or more is attained and residences or other noise sensitive uses exist. <u>Encourage installation of sound barriers adjacent to roadways in other areas where significant noise sensitive land uses exist.</u>

Significance After Mitigation Adoption of the relevant policies, including the revised Policy **NE-2b**, would reduce the adverse impacts of increased traffic noise on land uses along noise impacted roadway segments. However, due to funding constraints and limited feasibility of sound barriers in some areas, these impacts would not be reduced to a less-than-significant level. Therefore, this would remain a significant impact. (**SU**)

Responsibility and Monitoring The Board of Supervisors would be responsible for adopting the above policy as part of the *GP 2020*. The PRMD would be responsible for monitoring implementation.

Impact 4.4-2 Impact to Noise Sensitive Development from Roadway Noise
Future noise sensitive development could expose new sensitive receptors to roadway noise levels greater than those considered normally acceptable. This would be a less-than-significant impact. ***(LTS)***

The Noise Element of the *Draft GP 2020* states that noise sensitive land uses include the following:

- Residences
- Schools
- Hospitals and nursing homes
- Churches and libraries
- Long-term medical or mental care facilities
- Other uses deemed noise sensitive by the local jurisdiction

Projected noise levels on several of the roadway segments would extend into areas where noise sensitive land uses might be located in the future and could result in new land uses being exposed to road noise levels in excess of 60 dB L_{dn}. Policy **NE-1a** would direct the designation of areas within Sonoma County as noise impacted if they are exposed to existing or projected exterior noise levels exceeding 60 dB L_{dn}, 60 dB CNEL or the performance standards in Table N-2. Therefore, development that would occur within the 60dB CNEL or L_{dn} traffic noise contours would result in the exposure of persons to noise levels in excess of standards established in the Noise Element. **Exhibit 7.7-7** in ***Appendix 7.7 Noise*** shows the distance from the center of the road segments studied to the 60 dB L_{dn} contour line. Based on **Exhibit 7.7-7** in ***Appendix 7.7 Noise*** those areas between the edge of the roadway and the 60 dB contour line would be considered noise impacted.

The *Draft GP 2020* includes policies which, if adopted and implemented, would reduce the traffic noise exposure of this new development. Policy **NE-1b** would require the avoidance of noise sensitive land uses in areas where the existing or projected exterior noise levels exceed 60 dB L_{dn}, 60 dB CNEL or the standards in Table NE-2 unless effective measures are included to reduce noise levels. Furthermore, this policy would require that the noise level be reduced to 60 dB L_{dn} in outdoor activity areas (with some exceptions), and that the interior noise levels not exceed 45 dB L_{dn} or 45 dB L_{eq}, depending on the land use. Policy **NE-1d** would require that noise analyses for new developments consider future traffic or transit conditions in arriving at the predicted future noise levels affecting the project.

Specific mitigation measures appropriate for each new noise sensitive development project would be determined during the environmental review process prior to project approval. However, the combination of Noise Element policies and standards described above would apply to these projects and would ensure that these impacts would be reduced to a less-than-significant level. Noise sensitive projects that do not require environmental review that may occur in close proximity to noise impacted roadways are not expected to be substantial in numbers.

Mitigation Measure 4.4-2 None Required.

Impact 4.4-3 Increased Rail Noise
Existing noise sensitive land uses could be exposed to substantially increased noise levels from rail activity. This would be a significant impact. ***(S)***

Goal **CT-4** of the *Draft GP 2020* would be to reduce future congestion along the US 101 corridor by developing the Sonoma Marin Area Rail Transit (SMART) project. The goal of the SMART project is

to provide passenger train service to Sonoma and Marin County residents along the Northwestern Pacific (NWP) rail corridor that lies next to US 101. Rail service would be provided along a 70-mile corridor extending from Cloverdale through Marin County to a San Francisco bound ferry terminal. Up to 14 station sites are currently assumed along the corridor, nine in Sonoma County and five in Marin County.

An environmental analysis of the SMART project has not yet been completed. It is possible that noise levels from passenger rail operations would exceed the County's noise criteria.

The SMART project could increase noise levels along the existing (but unused) NWP rail corridor within the unincorporated area of Sonoma County as well as the cities of Cloverdale, Healdsburg, Windsor, San Rosa, Rohnert Park, Cotati, and Petaluma. Noise sources associated with the SMART project would include the train engines, wheel squeals, train whistles, and stationary crossing bells.

The SMART environmental document will assess potential noise and vibration impacts. Because of the uncertainties associated with operational details, no comprehensive noise predictions can be included in this EIR and further discussion of potential impacts of increased rail noise would be speculative. It should be noted, however, that although SMART is not subject to noise standards contained the Sonoma County General Plan, compliance with Policy **NE-1b** would mean that the noise level due to transportation noise sources would have to be reduced to 60 dB L_{dn} in outdoor activity areas (with some exceptions), and that the interior noise levels could not exceed 45 dB L_{dn} or 45 dB L_{eq}, depending on the affected land use. Application of this policy to the SMART project would help ensure that appropriate mitigation measures would be incorporated into the project to reduce potential noise impacts to an acceptable level.

Mitigation Measure 4.4-3 No mitigation would be available to the County beyond the *Draft GP 2020* policies discussed in the impact analysis above. Mitigation of noise impacts resulting from the implementation of the SMART rail project would be the responsibility of the SMART District.

Significance After Mitigation This would be a significant unavoidable impact. (**SU**)

Impact 4.4-4 Impact to Noise Sensitive Development from Stationary Noise Sources
Existing and future noise sensitive development could be exposed to increased noise levels from new noise generating development greater than those considered normally acceptable. This would be a less-than-significant impact. ***(LTS)***

Potential stationary noise sources include activities associated with existing and new commercial / industrial land uses. These include the existing stationary noise sources described in the setting section and include major industrial facilities such as mineral resource extraction and processing, facilities such as Redwood Empire Remanufacturing and Reuser Inc, wineries, and geothermal development. The location of new development could place new noise sources such as industrial or commercial land uses in close proximity to noise sensitive land uses, such as residential. In addition, development of new noise sensitive land uses (e.g., residential land uses) could place them in close proximity to existing or proposed commercial and industrial land uses. Noise conflicts could arise due to these juxtapositions of potentially incompatible land uses.

The *Draft GP 2020* Industrial Use Policy (i.e., Section 2.4 of the Land Use Element) would provide that some lands designated in industrial land use categories would also be available for development of affordable housing projects.

As a part of the actions necessary to implement the *Draft GP 2020*, it is proposed to amend the *Sonoma County Zoning Code* to include an Affordable Housing (AH) Combining District. The purpose of the AH Combining District would be to implement Policy **HE-3o** of the Housing Element of the *Draft GP 2020*, by identifying under-utilized commercial, industrial, or residential lands, within the county's Urban Service Areas. Such lands could be developed for housing affordable to Low and Very-Low income households to increase the supply of affordable housing to county residents.

Furthermore, both General Industrial and Limited Industrial land use categories would permit one caretaker unit per lot or residential use which is part of an integrated, live-work or mixed residential/industrial project.

For most of the land uses permitted by the Land Use Element, mitigation of potential noise impacts would be assured by implementation of the Noise Element's goals, objectives, and policies. Policy **NE-1b** would require the avoidance of noise sensitive land uses in areas where the existing or projected exterior noise levels exceed 60 dB L_{dn}, 60 dB CNEL or the standards in Table NE-2 unless effective measures are included to reduce noise levels. Furthermore, this policy would require that the noise level due to transportation noise sources be reduced to 60 dB L_{dn} in outdoor activity areas (with some exceptions), and that the interior noise levels shall not exceed 45 dB L_{dn} or 45 dB L_{eq}, depending on the affected land use.

Policy **NE-1c** would control non-transportation related noise from new projects. This policy would require that new projects with non-transportation noise sources comply with the noise standards of Table NE-2, as measured at the exterior boundary of any affected existing or reasonably foreseeable noise-sensitive land use. The noise standards of Table NE-2 are tiered, to allow longer exposure to lower noise levels than at higher noise levels. The noise standards are intended to be consistent with the ambient noise levels measured in typical noise sensitive areas, as documented in the setting section above and in the Noise Element Technical Reference Document. [7] Compliance with the Table NE-2 noise standards would ensure that the resulting noise levels would be within acceptable limits for Sonoma County residents, and would not allow a significant increase in ambient noise levels.

Policy **NE-1c** would allow the standards of Table NE-2 to be adjusted based on ambient noise levels, and to account for annoying characteristics of noise, such as pure tones and impacts. In addition, the policy would allow a conditional exception for noise-producing events that would occur a limited number of times per year (e.g., special events held at a winery or visitor service facility), recognizing that noise from such events is likely to be less annoying than noise from continuously-occurring activities.

Section 2.4 Industrial Use Policy of the *Draft GP 2020* Land Use Element includes both General Industrial (GI) and Limited Industrial (LI) land uses. This policy includes a requirement that, with exception of caretakers' residences, residential uses in industrial areas would be permitted subject to the approval of a master site plan where noise has been adequately addressed. This process would allow imposition of noise standards consistent with the Noise Element of the *Draft GP 2020*.

The development of housing as permitted by the AH Combining District could introduce noise sensitive land uses to a noise environment more typical of urban areas, where ambient noise levels are typically higher than in rural or undeveloped areas.

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7 The *Technical Reference Document Noise Element of the General Plan* is available for review at the PRMD office.

In order to meet the exterior and interior noise levels specified in the Noise Element, including Policy **NE-1b,** it would be necessary in most cases to incorporate specific noise mitigation measures into certain projects. Such measures could include noise barriers to meet the exterior noise limits and / or mechanical ventilation of buildings so that windows could be closed to achieve interior noise levels. Such measures would be determined upon review of the project. Implementation of Policy **NE-1b** and other policies noted above would reduce this impact to a less-than-significant level.

Mitigation Measure 4.4-4 None Required.

Impact 4.4-5 Airport Noise

*Air operations at Sonoma County Airports consistent with levels projected by the Draft GP 2020 Air Transportation Element could result in increased noise levels to surrounding areas including residential land uses. However, policies and programs contained in the Draft GP 2020 Noise and Air Transportation Elements would reduce this to a less-than-significant impact. **(LTS)***

The Air Transportation Element (ATE) establishes the projected growth of air traffic in Sonoma County and shows the predicted locations of the CNEL contours for each airport. The *Draft GP 2020* ATE primarily uses 2010 projections of air operations and corresponding noise contour maps taken from the 2001 Sonoma County Comprehensive Airport Land Use Plan (CALUP). [8] Projected levels of air operations for the six Sonoma County Airports are described in Table AT-3 of the *Draft GP 2020* ATE.

The *Draft GP 2020* ATE projects the same level of the air operations as the CALUP for the Cloverdale, Healdsburg, Petaluma, Sonoma Skypark, and Sonoma Valley airports. Therefore, the use of the CALUP noise contour maps for conditions in 2010 would be appropriate for modeling noise levels at these airports through 2020. [9]

In addition to projecting levels of air operations, the *Draft GP 2020* ATE and CALUP would apply noise standards to new residential developments that have a more restrictive impact threshold than those of the Noise Element. Specifically, the ATE provides in Objective **AT-1.3**, that, for new residential uses near airports, an aircraft noise exposure of 55 dB CNEL or less is acceptable, and that an aircraft noise exposure between 55 and 65 dB CNEL is conditionally acceptable. An aircraft noise exposure exceeding 65 dB CNEL would be unacceptable. Since the ATE and Noise Element contain policies (discussed later in this section) that would ensure mitigation for residential development outside the 65 dB CNEL contour, the threshold of noise impacts for airports in Sonoma County is 65 dB CNEL.

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8 *Sonoma County Comprehensive Airport Land Use Plan* (CALUP), January, 2001.

9 According to the Caltrans California Airport Land Use Planning Handbook, "because of the many variables and assumptions associated with their computation, cumulative noise contours representing *existing* airport activity are often considered to have a precision of approximately ±3 dB. Greater precision (within ±1 dB) can be obtained at airports where flight track data is available from radar and / or a permanent noise monitoring system is installed. In any case, precision is greatest close to the runway and decreases beyond where flight tracks diverge. As imprecise as this modeling of current noise contours can sometimes be, contours representing projections of *future* noise impacts are inherently even less precise." The Air Transportation Element is expected to be updated in 2007 at which time new noise contour maps for county airports would presumably be generated.

With respect to commercial passenger airline operations at Sonoma County Airport, the projected level of commercial passenger air operations would reach 5,000 annual commuter operations and 10,200 scheduled airline operations by 2020. Currently, there are no commercial air carriers operating at the airport. Commuter aircraft are typically turboprop aircraft, producing relatively low noise levels. Scheduled airlines typically use jet aircraft. The current trend in California is that scheduled airlines introduce air carrier service to small airports using regional jets, such as the Canadair 200/700 and the Embraer 135 / 145. These aircraft are relatively small (up to 70 passengers), and produce relatively low noise levels as compared to other jets. However, they do produce higher noise levels than turboprop aircraft.

Without knowing the fleet mix assumptions for the 2010 and 2020 forecasts, one cannot reasonably predict whether the projected differences in operations in 2020 would significantly change the size of the CNEL contours as compared to those prepared for the 2010 forecast. However, since ATE noise contours and policies limit the noise generated by commercial operations and since these operations are the primary factor in establishing the projected noise contours, the maximum level of operations allowed at the airport would not likely exceed the CNEL contour.

With respect to general aviation operations, noise levels at the Sonoma County Airport would be expected to increase as the *Draft GP 2020* ATE predicts 30,000 more General Aviation operations than does the CALUP (240,000 vs. 210,000). Unlike commercial jet aircraft, the noise levels produced by average, propeller-driven, airplanes used in general aviation operations have not changed appreciably over the years. The potential for future technological improvements is limited. Moreover, small, private airplanes tend not to be replaced with newer models at anywhere near the rate common to airline aircraft. Thus, for many years to come, the noise impacts of typical propeller airplanes are likely to remain little different from what they are now. [10]

However, if the overall fleet mix at the airport were to remain consistent with those of the CALUP, but the number of general aviation operations were to increase by 30,000 operations, or by about 13 percent, the predicted change in the CNEL values would increase by less than one decibel. As a point of reference, a doubling of operations would be required to create an increase of three dB CNEL.

The *Draft GP 2020* contains policies that would reduce the noise impact of airport operations consistent with levels described in the ATE on noise sensitive development. Noise Element Policy **NE-1b** would apply a noise impact threshold of 60 dB CNEL, and would allow development of noise sensitive uses in aircraft noise environments up to 65 dB CNEL if it were not possible to meet the 60 dB CNEL standard. Both the ATE and the Noise Element would allow noise sensitive development up to 65 dB CNEL, provided an interior noise standard of 45 dB CNEL is satisfied. Both the ATE and Noise Element policies would prohibit residential development in areas exposed to more than 65 dB CNEL.

ATE Policies **AT-3b**, **AT-3c** and **AT-3d** would regulate the single event noise levels produced by aircraft operating at Sonoma County Airport. Policy **AT-3e** would encourage the use of Stage 3 aircraft by new scheduled air carriers. [11] These measures would minimize the contributions of new scheduled air carrier operations to the CNEL exposures in the airport environs. In addition, the

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[10] *California Airport Land Use Planning Handbook*, Caltrans, 2002.

[11] In practice, this policy would have little effect, since Stage 2 aircraft are no longer in the national air carrier fleet.

nighttime single event noise standard in Policy **AT-3c** would limit annoyance and sleep disturbance in residential areas where aircraft over flights occur.

Policies **AT-5a** through **AT-5e** would regulate scheduled air carrier operations at Sonoma County Airport. At such a time as the average annual traffic volume exceeds 650 enplaned passengers per day, Policy **AT-5f** would require Board of Supervisors review of noise impacts.

In addition, implementation of Air Transportation Program 5 contained in the *Draft GP 2020* ATE would require PRMD to prepare an Approach Protection Zone that would implement the Sonoma County Comprehensive Airport Land Use Plan (CALUP) by identifying lands that are subject to its policies and regulations. County staff would provide notification to property owners and developers of possible land use restrictions on applicable lands associated with the CALUP.

The ATE does not include any policies that would directly mitigate the environmental impact of aircraft noise exceeding 65 dB CNEL at an incompatible (i.e., noise sensitive) land use. However, the California Airport Noise Regulation (CCR Title 21, Subchapter 6) would require that the airport operator ensure that all land uses would be compatible within the 65 dB CNEL contour. This regulation would be enforced by Sonoma County.

Implementation of the ATE standards for residences between the 55 dB and 65 dB CNEL contours would require that an acoustical analysis be prepared to demonstrate that the building facades would provide an aircraft noise level reduction (NLR) adequate to satisfy the interior noise standard of 45 dB CNEL. Standard energy-conserving residential building practices may be expected to provide an aircraft NLR of 20 to 25 dB, assuming that windows and doors are closed. Therefore, satisfaction of the 45 dB CNEL interior noise standard would be practical for most residences in the ATE noise impact area, assuming modern County-approved construction practices. For residences with extraordinarily large window surface areas, acoustical glazing could be required to meet the interior noise standard, but it is expected that the standard could be readily achieved. The ATE standards provide no other restrictions on residential development where the exterior noise level is below 65 dB CNEL. Therefore, satisfaction of the interior noise standard would mitigate the noise impact upon residential developments with a noise exposure less than 65 dB CNEL.

LAND USE IMPLICATIONS

The 55 dB and 60 dB CNEL contours for the Sonoma County Airport contained in the ATE include existing residential land uses in Sonoma County and the Town of Windsor. Implementation of the more restrictive noise standard proposed in the *Draft GP 2020* ATE would result in an additional 7.71 square miles (the amount of land within the 55 and 60 dB contours) being placed within the "conditionally acceptable" category.[12] The 65 dB CNEL contour includes lands designated for commercial, industrial, transportation and utilities uses as well as for agricultural and resource development. No lands within the 65 dB CNEL contour are designated for residential development, so no noise impacts would be expected to occur.

Land use changes and environmental review would be required prior to residential development of the unincorporated lands within the expanded "conditionally acceptable" designated area (within the 55 dB and 60 dB CNEL contours) adjacent to the Sonoma County Airport, though individual residences

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12 *Sonoma County Comprehensive Airport Land Use Plan* (CALUP), January, 2001.

could be built on existing parcels with suitable zoning. Noise effects on these residences would be mitigated by the policies of the ATE and the Noise Element.

Using the ATE CNEL contours, one may evaluate the effects on land use compatibility in the airport environs by considering the land uses contained in the projected 65 dB CNEL contour. If the airport were to realize the growth anticipated by the 2020 forecast, these areas would experience an increase in noise levels, but the noise levels would not be likely to exceed the criterion value of 65 dB CNEL, or extend this noise contour outward.

According to the base maps provided in the ATE, (see Figures AT-4 through AT-9 of the ATE of the *Draft GP 2020)* there would be no significant noise impacts due to projected future aircraft noise contours for the Cloverdale, Healdsburg, Sonoma Skypark, and Sonoma Valley airports. For the Petaluma Airport however, the future 55 dB and 60 dB CNEL contours would include existing residential land uses in the city of Petaluma. The 65 dB CNEL contour would be immediately adjacent to existing residences in the city of Petaluma. Land use changes and environmental review would be required prior to residential development of the unincorporated lands within the 65 dB CNEL contour. Noise effects on these residences would be mitigated by the policies of the ATE and the Noise Element. Therefore no additional noise impacts are expected within the unincorporated portion of Sonoma County.

Airport noise impacts would be adequately reduced by the implementation of policies contained in the both Air Transportation and Noise Elements of the *Draft GP 2020*, as well as by the California Airport Noise Regulation. Therefore, this would be a less-than-significant impact and no mitigation would be required.

Mitigation Measure 4.4-5 None Required.

4.5 HYDROLOGY AND WATER RESOURCES

4.5 HYDROLOGY AND WATER RESOURCES

This section presents the existing conditions, summarizes the regulatory and planning framework, and analyzes the impacts to the surface water and groundwater resources of Sonoma County associated with *Draft GP 2020*. Impacts to water supply and wastewater treatment are discussed in ***Section 4.9 Public Services***. Note that there is extensive overlap in regulatory programs governing environmental aspects of water quality, and the drinking water quality and public health aspects of water supply protection. There is also overlap in the characterization of groundwater aquifers as they pertain to potential water supply for rural communities in the county.

Hydrology and Water Resources – Environmental Setting [1]

CLIMATE AND TOPOGRAPHY

The climate of Sonoma County is characterized as Mediterranean. Temperatures along the coast are generally cool throughout summer and seldom drop below freezing in winter. Inland, however, temperature can vary greatly, with occasional highs exceeding 100 degrees Fahrenheit and lows sometimes falling below freezing.

Both precipitation and temperature in Sonoma County are influenced by the area's topography, the Pacific Ocean, and the waters of San Pablo Bay to the south. Annual precipitation generally increases with elevation, and is greatest in the western part of the county. Average annual precipitation ranges from roughly 20 inches in the southeastern county to 30 to 40 inches in central and northern valley areas. Annual precipitation in upper and coastal watersheds can exceed 80 to 100 inches. During summer months, low clouds and evening drizzle in coastal areas can provide enough moisture to keep vegetation green. Inland, however, the summer dry period is long enough to deplete soil moisture and dry up vegetation. [2]

SONOMA COUNTY WATERSHEDS

The term *watershed* refers to an area that is tributary to or drains to a particular river or creek system. Hydrologically, land in Sonoma County falls within seven distinct watersheds, of which the Russian River watershed is the largest in terms of area, runoff volume, number of cities and population. Due to the large size of the Russian River watershed and the complexity of the coastal watersheds, it is useful to divide or group the Russian River watershed and several of the coastal watersheds into subbasin units whose size and boundaries are determined by several common traits including runoff patterns, geology, topography, vegetation, and land use.

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1 The information sources used to prepare this section are listed in ***Appendix 7.8 Hydrology and Geology Source Information***.

2 United States Department of Agriculture (USDA), Forest Service and Soil Conservation Service, 1972. Soil Survey of Sonoma County, California.

The following section describes the important characteristics of Sonoma County watersheds and subbasins.[3] These watersheds and subbasins are illustrated in **Exhibit 4.5-1** and summarized in **Exhibit 4.5-2**.

North Coast Watershed

The North Coast watershed is comprised of 49 square miles of coastal area in western Sonoma County. It consists of a number of smaller watersheds, or subbasins, containing small creeks that drain directly to the Pacific Ocean. The elongated watershed has an average width of 1.5 miles and stretches approximately 30 miles north from the town of Jenner at the mouth of the Russian River to the Mendocino County Line south of the town of Gualala. Elevations range from approximately 2,000 feet mean sea level (MSL) at the tops of the steep mountain ridges along the eastern boundary of the watershed to sea level. Runoff in these areas generally flows west via a series of generally steep intermittent streams that flow into the ocean at several locations along the coast. Major streams within the watershed include Russian Gulch, Kolmar Gulch, Stoekhoff Creek, Miller Creek, and Stewarts Creek.

The climate along the coast is generally mild throughout the year. Vegetation along the coastal margin is dominated by nonnative grassland and closed cone pine forest (Bishop Pine, Monterey Cypress). Coastal redwood forest with Douglas fir and tan oak occur in the eastern portion of the watershed, approximately one half-mile inland. Most the land in the North Coast watershed is rural (70 percent) and used predominantly for grazing, timber production, and some rural residential development exists on large lots. Other land uses in the watershed include public recreation (21 percent) in State and county parks and beaches, and agricultural crop production (9 percent). This watershed is lightly urbanized. Fort Ross, Timber Cove, Stewarts Point, Salt Point State Park, and the community of Sea Ranch are located in this watershed.

Generally, flooding problems within the North Coast watershed consist of coastal flooding associated with elevated sea levels and wave run up during large storm events, or, very rarely, with tsunamis, also called tidal waves, that are caused by earthquakes underneath the ocean floor. Tsunami hazards are discussed in ***Section 4.7 Geology / Soils.***

The North Coast Regional Water Quality Control Board (RWQCB) has not classified any waterways within the North Coast Watershed as impaired. The main watershed management issues are sea cliff or bluff retreat, upland gully erosion of historically intensively grazed rangeland areas, erosion following large wildfires of brush land and forested areas, and streambank failure along the many intermittent creeks along the coast.

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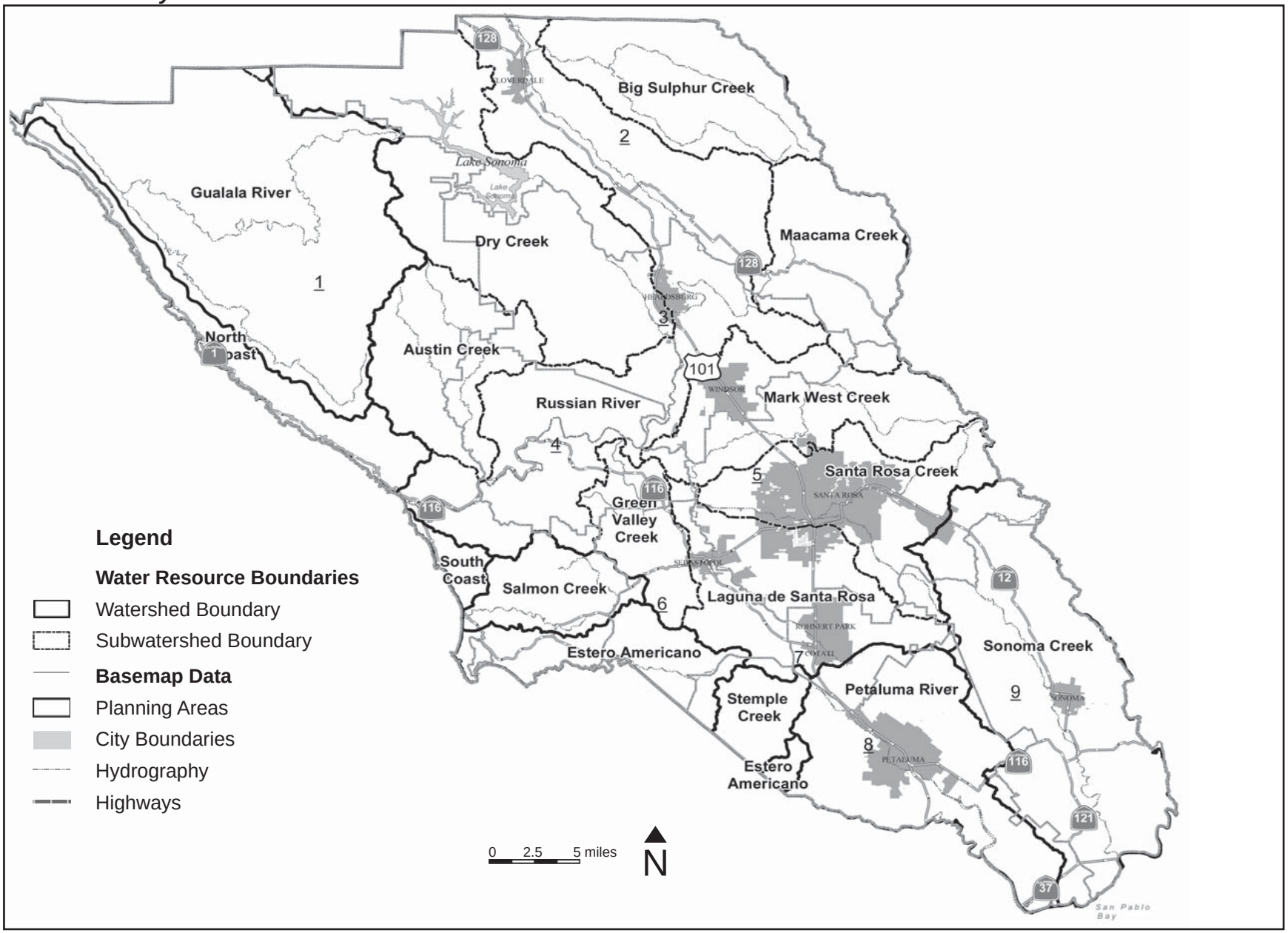
[3] The watershed information summarized in pages 4.5-1 thru 4.5-16 is a compilation of several sources and methods that are listed in ***Appendix 7.8 Hydrology and Geology Source Information***.

Exhibit 4.5-1
Sonoma County Watersheds and Subwatersheds



Source: Sonoma County PRMD, 2005

Exhibit 4.5-2
Summary of Sonoma County Watersheds and Subbasins

Watershed	***Impaired Water Body*** [a]	***Land Use*** [b]	***Hydrological Issues***
North Coast 49 square miles	No	70% Rural 21% Park/Recreation Area 9% Agricultural	Sea cliff / bluff retreat Upland gully erosion Stream bank failure
Gualala River 269 square miles	Yes	99% Rural (timber & grazing)	Excessive sedimentation & siltation due to habitat modification and erosion of unpaved roads.
Russian River 1,485 square miles (921 sq. mi. in Sonoma County)	Yes		Sedimentation & siltation due to grazing, agriculture, road construction, & habitat modification.
Russian River Subbasin *237 square miles*		61% Rural 32% Agricultural 4% Park/Recreation Areas	Flooding, bank erosion, streambed downcutting, elevated bacterial levels, hillside vineyards, and Gravel mining.
Austin Creek Subbasin *70 square miles*		93% Rural 7% Park/Recreation Areas	Erosion along roads
Dry Creek Subbasin *175 square miles*		57% Rural 20% Agricultural (vineyards & orchards) 12% Recreational 10% Commercial/Industrial	Erosion along roads, vineyards & orchards Creek bank instability Loss of riparian habitat
Big Sulphur Creek Subbasin *80 square miles*		97% Rural 3% Agricultural	Erosion along unpaved roads Erosion after wildfires

Watershed	***Impaired Water Body*** [a]	***Land Use*** [b]	***Hydrological Issues***
Maacama Creek Subbasin *69 square miles*		44% Rural 46% Agricultural 7% Commercial/Industrial	
Santa Rosa Creek Subbasin *81 square miles*	Yes	38% Rural 35% Urban 18% Agricultural 8% Park / Recreation Areas	Urbanization (water quality and stormwater runoff) Bank stability, fisheries, and riparian restoration.
Laguna de Santa Rosa Subbasin *89 square miles*	Yes	17% Urban 44% Agricultural 33% Rural	Flooding in the lower reaches Siltation and shallowing causing loss of floodplain storage and flood conveyance capacity. Water quality and biological resources.
Mark West Subbasin *83 square miles*	Yes	55% Rural 29% Agricultural 11% Urban	Low gradients in lower reaches result in some flooding.
Green Valley Subbasin *37 square miles*	Yes	56% Agricultural 39% Rural	Inadequate channel capacities along Atascadero Creek cause flooding problems. Expansion of two large rock quarries has potentially impacted water quality and salmonid habitat.
Sonoma Creek 170 square miles	Yes	54% Agricultural 30% Rural 11% Park/Recreation Areas	Flooding, stream bank erosion, riparian & fisheries habitat, water diversions, & groundwater pumping Sedimentation, nutrients, & pathogens
Estero Americano 50 sq. mi. in Sonoma County	Yes	Rural, very little development	Gully erosion, stream bank instability

Watershed	***Impaired Water Body*** [a]	***Land Use*** [b]	***Hydrological Issues***
Petaluma River 146 square miles (112 sq. mi. in Sonoma County)	Yes	Mainly agricultural	Flooding Sedimentation/siltation, nutrients, & pathogens
Stemple Creek 22 sq. mi. in Sonoma County	Yes	91% Agricultural 8% Park/Recreation Areas	High nutrient levels
Salmon Creek 37 square miles	No	51% Agricultural 47% Rural	Gully erosion, stream bank instability
South Coast 9 square miles	No	79% Agricultural 17% Park/Recreation Areas	N/A

a The term *Impaired Water Body* refers to waters that are not attaining water quality standards set forth by the Environmental Protection Agency and regulated by the State Water Resources Control Board (SWRCB).

b Land use percentages by watershed were derived from *General Plan Land Use Data* (ArcView 3.2 Shapefile format) provided by the Sonoma County PRMD. This information reflects existing land use designations in the existing *General Plan* and is based on scanned Assessor Parcel Maps. The land use categories presented in **Exhibit 4.5–2** include the following General Plan land use categories found in the original data set:

Rural = Resources and Rural Development (RRD) and Rural Residential (RR) This category includes timber, grazing, and open space.

Urban = Urban Residential (UR), and City

Agricultural = Diverse Agriculture (DA), Land Extensive Agriculture (LEA), and Land Intensive Agriculture (LIA).

Park/Recreation Area = Recreation and Visitor-Serving Commercial (RVSC), Public / Quasi-Public (PQP), and River (RIV).

Commercial/Industrial = General Commercial (GC), Limited Commercial (LC), General Industrial (GI), and Limited Industrial (LI).

Source: Information compiled by Questa Engineering Corporation.

Gualala River Watershed

The Gualala River watershed runs parallel to the coast of southern Mendocino and northern Sonoma Counties. In Sonoma County, the watershed is bounded on the west by the North Coast watershed and drains approximately 269 square miles. The Gualala River watershed has an average width of 14 miles and runs approximately 30 miles south to north from near Fort Ross to the town of Gualala in Mendocino County. Major streams and tributaries to the Gualala River located in the Sonoma County portion of the watershed include: Big Pepperwood Creek, Rockpile Creek, Buckeye Creek, Wheatfield Fork, Marshall Creek, Sproull Creek, McKenzie Creek, and Carson Creek. The Gualala River supports an important steelhead fishery, and some of these tributaries contain important spawning and juvenile fish rearing areas. The small community of Annapolis is in this watershed. Virtually all of the terrain within the watershed is rugged and mountainous. Elevations range from sea level to roughly 2,602 feet above mean sea level (MSL) at Gube Mountain. A large landslide deposit extending approximately five miles has been mapped along east-facing slopes of the Gualala River valley in the northern portion of the watershed and likely contributes significant sediment to local waterways.

While the climate near the coast is generally mild throughout the year, temperature in inland areas can vary greatly. Redwood forests occupy the northwestern portion of the watershed, especially in fog influenced bottomland areas, while Douglas fir dominates in central and mid-slope locations more distant from the coast, especially on north facing slopes. Further inland in the eastern portion of the watershed, Douglas fir forests are fragmented by oak woodland and large prairie grasslands.

Because of the steep, rugged terrain there are a limited number of land uses that occur within the Gualala River watershed. Logging began during the mid-1800s. In the early days, after being logged, forests were often burned in an attempt to clear the land for grazing purposes. Natural clearings as well as human-cleared areas on the eastern side of the watershed were used historically for grazing. Grazing has declined since the 1980's, but some small-scale timber harvesting operations in the Gualala River watershed are still active today. While only a small number of paved roads traverse the rugged terrain of the watershed, a well-developed network of unpaved forest roads occurs throughout. Erosion of road cut faces and at unimproved drainage crossings are contributors of sediment to the Gualala River system. The combination of inherently unstable ground, climate, and the past intensive grazing and timber production has led to accelerated erosion within the Gualala River watershed. The State Water Resources Control Board (SWRCB) has characterized the Gualala River as an impaired water body due to excessive sedimentation and siltation of local waterways and elevated temperatures. It has been estimated that while natural sediment yield accounts for one third of the total sediment delivery in the Gualala River watershed, human-caused sediment accounts for two thirds of the sediment delivery in the watershed. Land use factors contributing to accelerated erosion and sedimentation are partially attributed to: 1) failure of streamside logging roads during major storm events; 2) landslides and slope instabilities resulting from poor logging practices; and 3) poorly designed vineyards in steep upland areas of the watershed. The removal of trees that provide shade over waterways may contribute to elevated water temperatures.

Watershed planning activities, including completion of biological inventories and a hydrologic analysis, are currently being conducted for the Gualala River watershed by the State Coastal Conservancy and several other State agencies, in cooperation with the Gualala River Watershed Council. The California Geological Survey also recently completed a geologic and geomorphic study of the watershed, as part of the North Coast Watershed Assessment Program.

Russian River Watershed

The Russian River watershed occupies much of both Mendocino and Sonoma Counties. The watershed occupies an area of roughly 1,485 square miles, approximately 770 square miles of which are located in Sonoma County. In Sonoma County, the Russian River watershed has been divided into nine subbasins for the purposes of this EIR: Russian River; Dry Creek; Big Sulphur Creek; Green Valley Creek; Laguna de Santa Rosa; Santa Rosa Creek; Maacama Creek; Austen Creek; and Mark West Creek

The North Coast RWQCB and several other agencies have monitored the water quality of the Russian River watershed since the early 1970's. Monitoring results indicate that levels of total nitrate, total phosphate, dissolved oxygen (DO), hydrogen ion concentration (pH), and toxic chemical (carcinogenic and non-carcinogenic organic chemicals) concentration are, for the most part, in compliance with water quality objectives. Elevated water quality constituents in the main stem of the Russian River are generally associated with total dissolved solids (TDS), turbidity, and high bacteria concentrations. Recreational users and malfunctioning individual septic systems contribute to the introduction of fecal coliform bacteria into the river.

The North Coast RWQCB has classified the entire Russian River watershed as an impaired water body due to excessive sedimentation and siltation. The impairment is attributed to historic grazing, agriculture, logging, road construction, and habitat modification.

The majority of areas subject to flooding in the Russian River basin are adjacent to the Russian River between Mirabel Park and Duncans Mills. Flooding has occurred along the lower and middle reaches of the Russian River and is a natural renewal process of the river. Coyote and Warm Springs Dams provide flood protection from overflow of the Russian River during winter and spring months.

Floods in the Russian River watershed are generally of short duration, lasting three to four days. They normally develop within 24 to 48 hours after the beginning of a large flood-producing storm event, and recede within two to three days or less of the end of the storm. Typically, flows in the smaller tributaries to the Russian River rise so rapidly that flooding occurs within four to six hours of a storm event. Some of the lands along the Russian River in the vicinity of Cloverdale have been partially protected by levees. However, flood flows often break out of the Russian River at predictable low points or areas of constriction. Although flood frequency and base flood elevations (BFEs) have been reduced along this part of the river by the construction and operation of the Coyote Dam in Mendocino County, and the Warm Springs Dam project, repetitive major flood problems still persist along the lower river in Guerneville.

Bank stabilization and erosion control projects have been constructed along the main stem of the Russian River by the U.S. Army Corps of Engineers and individual property owners. The maintenance responsibility for projects installed by the U.S. Army Corps of Engineers is generally the responsibility of local interests. Erosion and sedimentation in the main stem is often associated with peak releases from dams.

Subbasins of the Russian River watershed are described below.

Russian River Subbasin

The Russian River subbasin consists of roughly 237 square miles in central Sonoma County. The subbasin follows the course of the Russian River Valley floor as it curves and bends from the broader inland valley areas in north central Sonoma County, flowing southeast along US 101 to the narrow

mountain flanked river corridor where it turns west along Highway 116 towards the coast. Major communities along the river include Cloverdale at the north end, Geyserville and Healdsburg in the Alexander Valley, Mirabel Park, Rio Del, Guerneville and Monte Rio in the middle river corridor, and Jenner, where the river discharges into the Pacific Ocean.

Although the valley floor is relatively flat, it is flanked on either side by steep to moderately steep mountain ridges that form the topographic divide between other subbasins of the watershed. The subbasin is approximately 45 miles in length, with an average width of six miles. Elevations within the subbasin range from to sea level to 3,250 feet above MSL along mountain ridges east of Cloverdale. Major tributaries to the subbasin (Dry Creek, Big Sulphur Creek, Maacama Creek, Santa Rosa Creek, Green Valley Creek, Austin Creek, Mark West Creek, and Laguna de Santa Rosa) are described as separate subbasins below.

Temperatures within the Russian River subbasin vary greatly with elevation. Vegetation in upper parts of the watershed has been altered by human activities, with prior forested lands converted in some areas to vineyard and orchard crops. Coastal areas of the lower watershed consist primarily of annual grassland and Redwood forest. Land use within the subbasin is primarily rural (61 percent) and agricultural (32 percent) but there has been an increasing trend of light industrial and commercial in urban areas such as Guerneville, Healdsburg, and Cloverdale. Tourism, vineyards, and wine production are major industries, with only a very small amount of timber production. Gravel mining along the Russian River has also been an important part of the watershed economy, although a major long term goal of the County's Aggregate Resources Management Plan (ARM) has been to shift reliance from river and terrace mining to hillside quarries.

Major watershed management challenges in this watershed include flooding, and significant bank erosion and streambed downcutting, especially in the upper reaches of the river. River downcutting may be linked to the geomorphic consequences of removal of bedload from the river, although this is uncertain. Lateral bank erosion along with agricultural activities has greatly reduced the width and extent of the historic riparian corridor along major parts of the river contributing to elevated river temperatures. As discussed later in this section, water quality problems, especially elevated bacterial levels remain an area of significant concern. The increased development of hillside vineyards in portions of this watershed subbasin and concerns over erosion from poor vineyard development practices led to the development of a county vineyard erosion control ordinance in 2000.

Austin Creek Subbasin

The Austin Creek subbasin is located in east-central Sonoma County. The subbasin, draining an area of roughly 70 square miles, flows south to the Russian River near Duncan Mills. The unincorporated town of Cazadero is the largest community in this watershed. Elevations range from over 2,000 feet MSL at Queen's Peak in the eastern portion of the subbasin to 50 feet MSL at the confluence of Austin Creek and the Russian River. Portions of this watershed receive up to 100 inches of rainfall annually. Major streams and tributaries in the subbasin include Austin Creek, East Austin Creek, Gray Creek, Schoolhouse Creek, Gilliam Creek, Thompson Creek, Ward Creek, Blue Jay Creek, Bearpen Creek, Red Slide Creek, Conshea Creek, and Black Rock Creek.

The steepest slopes in the headwaters of the Austin Creek subbasin are vegetated with Douglas fir and oak woodland. Vegetation in the lower elevations of the subbasin consists of Coast Redwoods and nonnative grassland and chaparral shrubs. Virtually the entire subbasin is rural (93 percent), with a small portion consisting of public parks and recreational areas (seven percent). Some small-scale timber harvesting operations still occur in this watershed. Historic timber harvesting of the mountain slopes and the construction of historic logging roads, many of which have been converted to property

access roads, has resulted in some areas with high soil erosion rates. Accelerated soil erosion along secondary roads, including some areas of landsliding, is the major watershed management issue that needs to be addressed.

Dry Creek Subbasin

Dry Creek, a major tributary to the Russian River, drains an area of approximately 175 square miles of north central Sonoma County. The western portion of the town of Healdsburg is located in this subbasin. Elevations in the subbasin range from 100 feet MSL in the lower valley area near Healdsburg, to approximately 4,000 feet MSL in the upland areas surrounding Red Mountain. While the headwaters are steep and rugged, the southern half of the subbasin opens up to the wide alluvial plain of Dry Creek. Major streams and tributaries in the subbasin include Cherry Creek, Galloway Creek, Smith Creek, Warm Springs Creek, Mill Creek, and Wallace Creek. Lake Sonoma, artificially created by the Warm Springs Dam at the confluence of Dry Creek, is the largest water body in the subbasin.

Vegetation in the Dry Creek subbasin consists mostly of oak woodland with areas of Douglas fir forest, mainly on north facing slopes, and with patches of chaparral, coast redwood, nonnative grassland, vineyard, and cropland. Land use in the subbasin is consists of rural (57 percent), agricultural, mainly vineyards and orchards (20 percent), and recreational (12 percent) land uses.

Watershed management problems include upland erosion along secondary roads and from vineyard and orchard areas, creek bank instability, and the loss of riparian habitat. The historic flooding problems along Dry Creek have largely been controlled by construction of the Warm Springs Dam.

Big Sulphur Creek Subbasin

Big Sulphur Creek, a tributary to the Russian River, drains approximately 80 square miles of northeastern Sonoma County. The historic Geysers Resort is located in this watershed. The subbasin is bound to the east by the Mayacamas Mountain Range and to the west by the Alexander Valley. Elevations in the watershed range from up 4,000 feet MSL along the border between Sonoma and Lake Counties, to approximately 400 MSL at the confluence of Big Sulphur Creek and the Russian River. Major streams and tributaries within the subbasin include Big Sulphur Creek, Little Sulphur Creek, Squaw Creek, Cobb Creek, Alder Creek, and Frasier Creek.

The Big Sulphur Creek subbasin is characterized by steep rugged terrain. Subbasin vegetation consists of chaparral, oak woodland, and some areas of mixed oak and pine forests at higher elevations and north slopes. Land-use in the subbasin is almost entirely rural (97 percent), with a small amount of agriculture (three percent) in the south. The most significant watershed management issue in this watershed is erosion along historic unpaved secondary access or utility roads, especially in the Geysers geothermal field area. The County and the California Energy Commission have policies and procedures in place for erosion control and sensitive area protection associated with new geothermal resource development in this area. Erosion following large brush land wildfires is also a management concern.

Maacama Creek Subbasin

The Maacama Creek subbasin, a small tributary to the Russian River, is located in east-central Sonoma County. The subbasin drains an area of 69 square miles. Elevations in the subbasin range from 120 feet MSL near the confluence of Maacama Creek and the Russian River to approximately 4,300 at Mount St. Helena. Major streams and tributaries include Maacama Creek, Franz Creek,

Bidwell Creek, Kellogg Creek, Little Briggs, and Redwood Creek. Knights Valley and the very small community of Kellogg occur in this area.

Vegetation in the subbasin is predominantly brush land and oak woodland intermixed with open Douglas fir and pine forests at higher elevations and north facing slopes. The land use in the upper portions of the subbasin is primarily rural residential (44 percent). The lower portion, which is in the vicinity of Knights Valley, is predominately agricultural (46 percent). The land use in the Mount St. Helena area is zoned recreational (3 percent). The remaining land use is zoned commercial or industrial.

Santa Rosa Creek Subbasin

The Santa Rosa Creek subbasin is located eastern and central Sonoma County. This roughly T-shaped subbasin drains an area of roughly 81 square miles. Elevations range from approximately 2,000 feet MSL along the easternmost boundary of the subbasin to roughly 100 feet MSL near the westernmost boundary. Major streams and tributaries in the subbasin include Santa Rosa Creek, Spring Creek, Brush Creek, Matanzas Creek, Colgan Creek, and Rincon Creek.

The central region of the Santa Rosa Creek watershed is largely urbanized (35 percent of the subbasin). Vegetation in the lower or south limb of the watershed is generally oak woodland on the slopes of the Sonoma Mountains and above Bennett Valley; in the eastern limb, oak woodland and Douglas fir forest, with the western limb, cropland and pasture.

The climate of the Santa Rosa Creek subbasin is cool, with mean temperatures ranging from 47 degrees Fahrenheit in winter to 68 degrees Fahrenheit during summer months. Average annual precipitation is approximately 30 inches.

Floodplain areas near the confluence of Santa Rosa Creek and Mark West Creek are subject to flooding during the 100-year storm event.

Watershed management issues in this watershed are primarily related to changes in stormwater runoff volumes and timing of peak flows, and water quality from urbanization. Bank instability, fisheries enhancement, and riparian restoration are also important issues

The City of Santa Rosa, in cooperation with the SCWA and the Committee for Restoring Santa Rosa Creek have been very active in the Santa Rosa Creek watershed, including completion of major creek restoration projects on Santa Rosa Creek and Brush Creeks, based on a Creek Master Plan, completed in 1992. The City is currently developing a City-wide Creek Plan that will address other creeks in this watershed, and has developed conceptual restoration plans for a number of creeks.

Laguna de Santa Rosa Subbasin

The Laguna de Santa Rosa subbasin drains an area of 89 square miles in south-central Sonoma County with the upper watershed originally on the west-facing slopes of the Sonoma Mountains. In the upper portions of the watershed are the cities of Rohnert Park and Cotati, as well as Sonoma State University. The city of Sebastopol is located in the lower part of the Laguna subbasin. In the northern part of the subbasin, Laguna de Santa Rosa converges with Mark West Creek prior to flowing to the Russian River. Elevations in range from 50 feet in the north, approximately one-half mile south of Mark West Creek, to 1400 feet MSL at Taylor Mountain. The primary waterway is Laguna de Santa Rosa, with major streams and tributaries being Blucher Creek, Hinebaugh Creek, Washoe Creek, and Gossage Creek.

A portion of the Laguna de Santa Rosa watershed has been urbanized (17 percent) or is in agricultural production (44 percent). Historic apple orchards around Sebastopol are being converted to vineyards in some areas, with new large-scale vineyard plantings on the foothills near Cotati and on the slopes of the Sonoma Mountains. Much of the remainder of the watershed land use is rural residential (33 percent). Vegetation in the rural areas includes oak woodlands on Sonoma Mountain, pasture and oat hay lands, and grazing lands in the valley bottoms and lower slopes, and along the mountain slopes in the northwest edge of the subbasin, mixed Douglas fir forest and oak woodland.

Flooding in the lower reaches of the Laguna de Santa Rosa is from backwater effects during major flooding along the Russian River and is a significant problem along low lying areas in the City of Sebastopol. Portions of the Laguna near Rohnert Park and Cotati have been channelized, including several urban tributaries.

One of the more significant watershed management problems is the siltation and shallowing of the Laguna. The broad, relatively flat gradient of the Laguna provides a natural floodplain storage area, and flooding would often be much worse downstream without the benefits provided by this storage. The loss of floodplain storage and the reduction of channel flood conveyance capacity due to siltation from sediment sources higher in the watershed are of major concerns to the SCWA, and are being investigated by the Corps of Engineers. An invasive water weed, Ludwigia, has also recently become a significant concern along the Laguna de Santa Rosa as it prevents effective management of mosquitoes. The high nutrient levels and shallow open waters of the Laguna favor the growth of this plant.

Other major watershed management issues of importance to local watershed stakeholders include protection of Laguna water quality, and the protection and restoration of the biological resources of the Laguna ecosystem, which supports a large number of endangered and protected animal and plant species.

Mark West Creek Subbasin

The Mark West Creek subbasin, located in northeastern Sonoma County, covers an area of approximately 83 square miles. The Town of Windsor, and the northern outskirts of the Santa Rosa urban area are in this watershed. The primary stream in the subbasin, Mark West Creek, is a tributary to the Russian River. Elevations in the subbasin range from 50 feet MSL near the confluence of Mark West Creek and the Russian River to over 2,000 feet MSL near Diamond Mountain in the eastern subbasin. Major Creeks and tributaries in the subbasin include Mark West Creek, Windsor Creek, Porter Creek, Wright Creek, Poole Creek, Mill Creek, and Van Buren Creek.

Topography in the Mark West subbasin divides the vegetation into two distinct areas. Uphill areas in the western half of the subbasin are densely vegetated by oak woodland and some Douglas fir forest. In contrast, gently sloped areas in the eastern half of the subbasin are generally grasslands with scattered oaks, or are urban and suburban areas. In addition, there are some areas of cropland and pasture, with vineyard plantings both on the valley bottom and the valley side slopes. The eastern portion of the Mark West Creek subbasin is bound by the Sonoma Mountains.

Low gradients in the lower reaches of Windsor, Poole, and Mark West Creeks cause water from the Russian River to backup and flood some portions of the western subbasin during high-intensity, short-duration storm events.

Green Valley Subbasin

The Green Valley subbasin is a tributary to the Russian River. The northwest corner of Sebastopol and the town of Forestville are located in this watershed. The subbasin drains an area of 37 square miles. Subbasin elevations range from 110 feet MSL at the confluence of Green Valley Creek and the Russian River to roughly 900 feet MSL at English Hill. Major creeks in the subbasin include Green Valley Creek, Atascadero Creek, and Purrington Creek.

Major portions of this subbasin consist of grassland and pasture areas, with some vineyards, and apple orchards. The higher lying slopes are covered with oak woodlands and Douglas fir forest.

Inadequate channel capacities along Atascadero Creek result in flooding problems in the outskirts of the City of Sebastopol during high-intensity, short-duration storm events.

There are two large rock quarries located in this subbasin, just outside of Forestville. The expansion of these two quarries has raised concerns regarding water quality and salmonid habitat along portions of Green Valley Creek. The increase in rural residential development in this area may also be affecting water quality in the subbasin.

Sonoma Creek Watershed

The Sonoma Creek watershed is located in the southeastern corner of Sonoma County. The City of Sonoma and the unincorporated communities of Boyes Hot Springs, Agua Caliente, Fetters Hot Springs, and Glen Ellen are all located on the valley floor near the center of the elongated watershed, with the community of Schellville in the lower or southern portion, near the edge of San Pablo Bay, and Kenwood in the upper or north end. The watershed consists of approximately 170 square miles. Elevations in the watershed range from sea level at San Pablo Bay to approximately 2,500 feet MSL at Bald Mountain. Major creeks and tributaries in the Sonoma Creek watershed include Tolay Creek, Schell Creek, Fowler Creek, Arroyo Seco, Yulupa Creek, Graham Creek, Mill Creek, Wilson Creek, Agua Caliente Creek, Calabazas Creek, Nathanson Creek, Dowdall Creek, Carriger Creek, Felder Creek, Asbury Creek, and Bear Creek.

The central part of the Sonoma Creek watershed on the valley bottom is mostly urbanized, while the lower creek valley is mostly in agricultural production. Approximately 54 percent of the watershed is in agricultural use, 30 percent is rural and about 11 percent is recreational. The vegetative cover of the hill slopes of the watershed, where not converted to vineyards, is mostly oak woodland and Douglas fir forests, with some areas of brush.

Flooding in the Sonoma Creek watershed is the result of intense, short-duration rainfall occurring within a larger duration storm event. Tidal action in the San Pablo Bay has a variable effect on flooding in the Sonoma Creek watershed. While flooding above the reclaimed tidal area is of relatively short duration, floodwater ponding in the floodplain adjacent to the San Pablo Bay can last for a few days. The principal flood problems in the main channel are caused by inadequate channel capacity to carry off large flows from short-duration storms of high intensity. Flood problems are accentuated by encroachment of residential development on the channels.

The San Francisco Bay RWQCB has classified the Sonoma Creek watershed as an impaired water body due to sedimentation, nutrients, and pathogens. The development of vineyards on steep hillsides, especially in the 1980s and early 1990s before the county developed vineyard erosion control regulations, has been attributed to be one of the major causes of erosion and sedimentation. This and other related watershed management issues were evaluated and addressed in the Sonoma Creek

Watershed Management Plan, with implementation currently underway by the Southern Sonoma Resource Conservation District (RCD) and the Sonoma Ecology Center through educational and outreach programs with stakeholder groups, including the Sonoma Valley Vintners and Growers Alliance.

The expansion of wineries and resultant wastewater management issues and the limitations in wastewater treatment plant capacity may be responsible for elevated pathogen levels within the watershed, as unlike the adjacent Petaluma River watershed, there are few dairies in this watershed. Other watershed management issues include flooding, stream bank erosion, riparian and fisheries habitat enhancement, and the effect of water diversions and groundwater pumping for vineyard irrigation on summer flow in creeks.

Estero Americano Watershed

The Estero Americano watershed is located in both Sonoma and Marin Counties and drains an approximate area of 49 square miles in Sonoma County. Elevations in the watershed range from just above sea level at the town of Bodega Bay and Bodega Harbor to roughly 650 feet in northern portions of the watershed. Creeks and tributaries in the watershed drain south to the Estero Americano, which flows west along the Sonoma / Marin County border to empty into the Pacific Ocean at a large natural tidal lagoon or estuary. Major tributaries to the Estero Americano include Cheney Gulch, Johnson Gulch, Ebabias Creek, and Stemple Creek. The majority of the Estero Americano watershed is in non-intensive agricultural production, with some oat hay lands, irrigated pasture, and extensive areas of dry pasture. Dairies and beef and sheep livestock ranches constitute a considerable portion of the watershed economy.

The Estero Americano has been classified by the North Coast RWQCB as an impaired water body due to high levels of nutrients and sedimentation/siltation. These watershed management issues are generally attributed to livestock grazing, management of dairy manure lagoons, streambank modification, and other agriculturally-related non-point sources. [4] Some of the problems are historical in origin, as the area was used farmed and grazed more intensively in the past.

Stemple Creek Subbasin

The Stemple Creek subbasin, a tributary to the Estero Americano watershed, is located in both Sonoma and Marin Counties. The subbasin begins just west of the City of Petaluma and empties into the Pacific Ocean through the Estero de San Antonio in Marin County. The creek drains approximately 22 square miles of southern Sonoma County. Subbasin elevations range from 600 feet MSL in the northern upland areas of the watershed to roughly 50 feet MSL in the south.

Virtually the entire Stemple Creek subbasin is in non-intensive agricultural production. Dairies and beef and sheep livestock ranches are the mainstay of the subbasin economy. Stemple Creek has been classified by the North Coast RWQCB as an impaired water body due to high nutrient levels. High nutrient levels are likely the result of the intensive use of pasture land and dairy manure lagoon management practices, including the spreading and spraying of lagoon wastes.

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[4] Non-point source pollution is discussed in *Impact 4.5-1 Water Quality – Residential, Commercial, Industrial, and Public Uses.*

Salmon Creek Watershed

The Salmon Creek watershed is a relatively small coastal watershed located north of Bodega Bay, draining approximately 37 square miles of western Sonoma County and discharging into the Pacific Ocean. Elevations in the watershed range from seal level to roughly 1200 feet MSL. Major creeks and tributaries in the watershed include Salmon Creek, Tannery Creek, Nolan Creek, Thurston Creek, Finley Creek, and Coleman Valley Creek.

This is one of the least disturbed watersheds in the county, with relatively few paved roads other than the Highway 1 (the Coast Highway), Joy Road, Coleman Valley Road, and the Bodega Highway. Salmon Creek supports both Coho and steelhead salmon. The small communities of Bodega and Freestone occur in this watershed.

Gully erosion of watershed lands, streambank instability, and enhancement of fishery habitat are among the major watershed management issues of this watershed. Salmon Creek is currently not listed as an impaired water body.

Petaluma River Watershed

The Petaluma River watershed is located in southern Sonoma and northern Marin Counties. Approximately 112 square miles of the 146 square mile watershed are located in Sonoma County. The City of Petaluma and the unincorporated community of Penngrove are located in this watershed. A portion of the Town of Novato and outlying unincorporated areas are located in the lower watershed.

Elevations in the watershed range from sea level at San Pablo Bay to about 3,000 feet MSL at Sonoma Mountain. Major tributaries to the Petaluma River in Sonoma County include Willow Brook, Lichau Creek, Lynch Creek, Adobe Creek, Ellis Creek, Liberty Creek, Marin Creek, and San Antonio Creek, which forms the border with Marin County. The lower 12 miles of the Petaluma River flow through the Petaluma Marsh. The river ultimately empties into the northwest portion of San Pablo Bay. Tidal influence extends approximately 14 miles upstream of San Pablo Bay, to near the confluence of Lynch Creek above downtown Petaluma.

Humans have played a large role in the alteration of the geometry and dimensions of the Petaluma River over time. Originally, a large portion of the river was actually a narrow, winding, and relatively shallow tidal slough. Dredging, deepening, straightening, and widening of the slough began in the 1850's to allow for the transport of goods via river from the north to San Francisco. Further widening and deepening of the creek occurred in 1880 and again in 1931 by the U.S. Army Corps of Engineers. The channel has been significantly altered all the way to the downtown area of Petaluma. In 1959, Petaluma Creek was officially declared a *river* by an Act of Congress. Because of its flat gradient and tidal influence, the river must be dredged about every four years to maintain navigability. The Petaluma River is one of the few remaining rivers in California that continue to support commercial river traffic. This allows the river dredging to be funded by Congress, but requires a special funding appropriation.

The majority of the Petaluma River watershed is in non-intensive agricultural production, including large areas of oat hay production and dairy cattle and sheep grazing lands. Irrigated hay and pasture lands (irrigated with reclaimed water from the City of Petaluma treatment plant) occur to the southeast of the city, along Lakeville Highway. From the late 19th century through the middle of the 20th century, chicken and egg products constituted a major source of income in the area. By the late 20th century, the chicken industry declined, and dairies and vineyard developments began to flourish

throughout the watershed. Vineyard development has occurred throughout the watershed from the 1990's to the present, including on Sonoma Mountain and along Lakeville Highway.

Flooding in the Petaluma River watershed is highly influenced by tidal action in the San Pablo Bay, particularly in the lower and middle river reaches. There are two main areas of significant flooding along the Petaluma River. The first area, between Denman Flat and the Lynch Creek confluence, consists mainly of scattered commercial, industrial, and undeveloped properties. The second area, referred to as the Payran Area Floodplain, lies between the Lynch Creek confluence and the Lakeville Street Bridge in the City of Petaluma, and consists mainly of residential properties developed during the 1960's.

Floods in the watershed may develop within 24 hours of a flood-producing storm, normally also coincident with a high tide event, and will typically recede within one day after the storm has ended. The worst flooding has occurred where a series of closely spaced storms move through the watershed, maintaining saturated soils and prolonged high flows in the tributary creeks. The largest flood of record in the Petaluma River Watershed occurred in January 1982 and caused an estimated $28,000,000 in damages in 1982 dollars. Other damaging floods occurred in 1986, 1995, and 1998, especially in the flood prone Payran area. The City of Petaluma in cooperation with the U.S. Army Corps of Engineers, the State of California, and the SCWA has nearly finished implementation of the Payran Reach Flood Control Project. This project includes channel widening, the construction of floodwalls and pump stations, and the replacement of bridges and railroad crossings that are obstructions to flood flow.

The Southern Sonoma County RCD completed a watershed management plan covering the Petaluma watershed. The plan focuses on the rural areas outside of the City of Petaluma, and includes an assessment and prioritization of upland erosion, bank instability, stream restoration, and water quality management needs. A major focus of the plan is on coordinating the development of TMDL water quality standards and programs in a way that will be compatible with the needs of agricultural industry, as the preservation and protection of open space lands and the agricultural economy is a high priority for this watershed.

The San Francisco Bay RWQCB has classified the Petaluma River as an impaired water body due to sedimentation / siltation and high levels of nutrients and pathogens. High nutrient levels could be attributed to dairy farms, equine facilities, and livestock producers. Sedimentation problems in tributaries are generally associated with new development and agricultural land use practices. Pathogen problems are generally attributed to agriculture and urban runoff. Additionally, high levels of metals have been detected at the mouth of the Petaluma River, in San Pablo Bay. It has not yet been determined whether the Petaluma River is a source of the metals.

SURFACE WATER QUALITY

Overall, Sonoma County is predominantly rural, with relatively few areas of intense development. Although anthropogenic land use changes have negatively impacted the water quality of some waterways in the county, water in the county is generally considered to be of good quality. While the EPA and the RWQCBs do not compile a list of waterways that have good water quality, they do compile a list of waterways that do not meet the water quality standards set forth by the EPA. The seven waterways in Sonoma County that have been placed on a Section 303(d) list by either the RWQCBs or the EPA are listed in **Exhibit 4.5-3**. These waterways are as follows: Estero Americano; Gualala River; Russian River; Stemple Creek; Big Sulphur Creek; Petaluma River; and Sonoma Creek. Additionally, San Pablo Bay, which receives water from the Petaluma River and Sonoma

Creek, has also been listed as an impaired water body for thirteen constituents. TMDL planning, which will address the water quality issues identified, is in the early stages of development for most of these watersheds. The most prominent water quality problems affecting waterways in the county are: (1) sedimentation and siltation; (2) nutrients; and (3) pathogens, or high bacteria levels.

Sedimentation and Siltation

Sedimentation and siltation problems are widespread throughout the county. Although this can be partially attributed to local topography, geology, and soils, land use practices are also to blame. Several common causes of excess erosion, sedimentation, and siltation are described here.

Agricultural practices, particularly more intensive agricultural land use, can result in an increase in sediment in local waterways. Farming and intensive grazing on steep slopes with erosive soils, creating poor ground cover conditions, can lead to accelerated erosion and sedimentation of the waterways. Road and highway construction has also contributed to sedimentation of the waterways.

Nutrients

In the context of water quality, the term nutrients typically refer to excess concentrations of nitrogen and phosphorus. Several anthropogenic or man-caused sources of nutrients are known to affect water quality in Sonoma County.

Farmers apply chemical fertilizers to crops in the form of nitrogen, phosphorus, and potassium. These elements are also concentrated in manure lagoons and wastewater from septic systems. These elements, when transported via land spreading and runoff or through direct or indirect wastewater discharges to streams, rivers, or lakes, result in excessive algal growth, which in turn increases the turbidity of the water and results in diminished water quality.

Pathogens

The presence of coliform bacteria in water, which are normally found in the intestines of humans and animals, signals that disease-causing pathogens may be present. Elevated levels of fecal coliform bacteria are the most common pathogen problem affecting the quality of water in Sonoma County. Pathogens enter water through wastewater discharges, leaking septic systems, and from animal waste, including from animal concentration areas such as feedlots and dairies. Giardia and cryptosporidium are also pathogens that are occasionally found in public water supplies and have the potential to cause serious illness among people.

Exhibit 4.5-3
Sonoma County 303(d) List

Waterway	Pollutant / Stressor	Priority	Source
Estero Americano	Nutrients	Medium	pasture land; manure lagoons
	Sedimentation / Siltation	Medium	grazing; hydromodification [a]; removal of riparian vegetation; streambank modification/destabilization; erosion/siltation; non-point sources [b]
Gualala River	Sedimentation / Siltation	Medium	specialty crop production; silviculture [c]; harvesting; restoration; residue management; logging road construction/maintenance; road construction; land development; disturbed sites; erosion/siltation; non-point sources
Russian River	Sedimentation / Siltation	Medium	specialty crop production; riparian grazing; upland grazing; agricultural runoff; silviculture; harvesting; restoration; residue management; logging road construction/maintenance; road construction; hydromodification; channelization; channel erosion; habitat modification; drainage/filling of wetlands; land development; disturbed sites; erosion/siltation; non-point sources
Stemple Creek	Nutrients	Low	pasture land; manure lagoons; non-point sources
San Pablo Bay [c]	Chlordane	Low	non-point sources
	Copper	Medium	municipal point sources; urban runoff; atmospheric deposition
	DDT	Low	non-point sources
	Diazinon	Medium	non-point sources
	Dieldrin	Low	non-point sources
	Dioxin compounds	High	atmospheric deposition [d]
	Exotic Species [f]	High	ballast water
	Furan compounds	High	atmospheric deposition [e]
	Mercury	High	municipal point sources; abandoned mines; atmospheric deposition; natural sources; non-point sources
	Nickel	Low	municipal point sources; urban runoff
	PCBs [g]	Medium	unknown non-point sources
	PCBs (dioxin-like)	High	unknown non-point sources
	Selenium	Low	industrial point sources; agriculture; natural sources; exotic species

Waterway	*Pollutant / Stressor*	*Priority*	*Source*
Petaluma River	Nutrients	Medium	Agriculture; land development; urban runoff
	Pathogens	Medium	Agriculture; land development; urban runoff
	Sedimentation / Siltation	Medium	Agriculture; land development; urban runoff
Sonoma Creek	Nutrients	Medium	Agriculture; land development; urban runoff
	Pathogens	Medium	Agriculture; land development; urban runoff
	Sedimentation / Siltation	Medium	Agriculture; land development; urban runoff

a Hydromodification is any alteration of a stream channel.

b Non-point source pollution is discussed in *Impact 4.5-1 Water Quality – Residential, Commercial, Industrial, and Public Uses.*

c Silviculture is a branch of forestry dealing with the development of forests.

d The Petaluma River and Sonoma Creek discharge to San Pablo Bay.

e Anthropogenic and/or natural sources release these compounds into the atmosphere. These compounds are later deposited on land and water.

f Exotic species disrupt natural benthos, change pollutant availability in food chain, and disrupt food availability to native species.

g Polychlorinated biphenyl fluids (PCBs) are used for heat transfer and electrical insulation properties and are common industrial contaminants. These materials, under certain fire or explosion situations can also produce the more toxic compounds of the dioxin family - the polychlorodioxins and polychlorofurans.

Sources: *California 303 (d) List and TMDL Priority Schedule,* State Water Resources Control Board, 1999 and 1998.

GROUNDWATER

During and after a storm event, rainfall may infiltrate into the ground surface, move downward through spaces between soil particles, and enter a zone of saturation. This zone of saturation is also referred to as groundwater and its replenishment by water moving downward is called groundwater recharge. Land areas vary widely in their recharge capability, depending on soil conditions and the underlying geology. In Sonoma County, rivers and stream corridors are important source areas for groundwater recharge, as are some upland areas underlain by permeable formations. A four-tier classification system is used to indicate general areas of groundwater availability: Class I is the major groundwater basins; Class II is major natural recharge areas; Class III is marginal groundwater availability areas; and Class IV is areas with low or highly variable water yield.

Groundwater is generally confined to geologic formations with high porosity or water-holding capacity called aquifers on a local scale, and groundwater basins on a regional scale. If aquifers are contiguous, groundwater can migrate between aquifers. In some cases, multiple aquifers occur, separated by less permeable or impermeable (clay) layers called aquacludes.

Much of Sonoma County is underlain by hard bedrock with low porosity. In these areas, groundwater is often only contained in large fractures in the rock. The capability to furnish water to wells is quite variable in these areas, depending on the degree and extent of rock fracturing, and the connectivity of fractures with each other and to recharge areas.

Groundwater is a vital source of water supply for both agricultural and urban uses in Sonoma County. In fact, Sonoma has the second largest number of wells of any county in California. Groundwater is

located and tapped by drilling wells into the zone of saturation. However, not all areas otherwise suitable for development have groundwater present in sufficient volume to meet the intended use of the well, have a reasonable rate of recharge, or have water of potable quality. The term *safe yield* is defined as "the maximum quantity of water which can be withdrawn annually from groundwater supply under a given set of conditions without causing an undesirable result". Undesirable results include physical harm to the aquifer from consolidation, ground settlement, water quality problems from intrusion of less desirable water from other areas, interference with prior rights of others in adjacent groundwater areas, and declines in the water table. In some areas the quality and beneficial use of groundwater has been affected by contamination from leaking underground storage tanks or other pollutant sources. General groundwater availability issues found in portions of Sonoma County are discussed below.

Groundwater provides an important portion of the water supply for the cities of Sonoma, Sebastopol, Cotati, Rohnert Park, and Petaluma. The Valley of the Moon Water District and the Sonoma County Water Agency also rely on groundwater to supplement their water supply.

The most recent comprehensive scientific assessment of groundwater resources in Sonoma County was performed between 1975 and 1982 by the California Department of Water Resources (DWR) in cooperation with the SCWA. This assessment was conducted by performing a series of studies documented in DWR Bulletin 118-4. Although DWR was directed to update Bulletin 118 (including 118-4 for Sonoma County) by legislative authorization in the State's Fiscal Year 1999 / 2000 Budget, this update was limited to a brief summary compilation of existing information due to State funding constraints. Given the changes in land use and population that have occurred over the past 30 years, information regarding groundwater resources in Sonoma County is outdated and may not represent current conditions.

Groundwater Issues

Decrease in Groundwater Recharge Rates

An increase in impervious surface area due to development, coupled with the increased use of groundwater resources, may have contributed to the decline of groundwater levels in several areas of the county. When impervious surfaces are placed over groundwater recharge areas, the percolation of surface water into the underlying water table is impaired and the surface water runs off, sometimes resulting in a decrease in groundwater recharge. Even in areas with high groundwater recharge rates, if the amount of groundwater extracted by local groundwater wells is greater than the amount of groundwater recharge, groundwater levels will gradually decline. When the rate of groundwater withdrawal exceeds the rate of recharge and occurs over a prolonged period of time, groundwater levels can drop dramatically and the aquifer may become overdrafted. In some cases, the decline in local groundwater levels has been such that groundwater wells must be lowered to maintain production levels or new wells drilled.

Lack of Groundwater Monitoring

Although it is clear that groundwater levels are dropping in several areas of the county, proper evaluation of groundwater level fluctuations and changes is difficult due to the scarce distribution of groundwater monitoring wells throughout the county. While some groundwater level data are available online at the State Department of Water Resources' (DWR) Water Data Library, and from the US Geological Survey, the distribution of the monitoring wells is not adequate to assess the rate, extent, and severity of groundwater level fluctuations throughout the county.

Local Well Interference

Groundwater pumping from a well will lower local groundwater levels in the vicinity of the well. The affected area, called the cone of depression, is usually a cone-shaped lowering of the water table, within which the local aquifer is dewatered. The land area above the cone of depression is called the area of influence. If the cones of depression of two or more adjacent wells overlap, there is said to be well interference. Well interference can restrict water yield in these wells. Well pumping tests can be completed to assess the effects of a test well on existing adjacent wells.

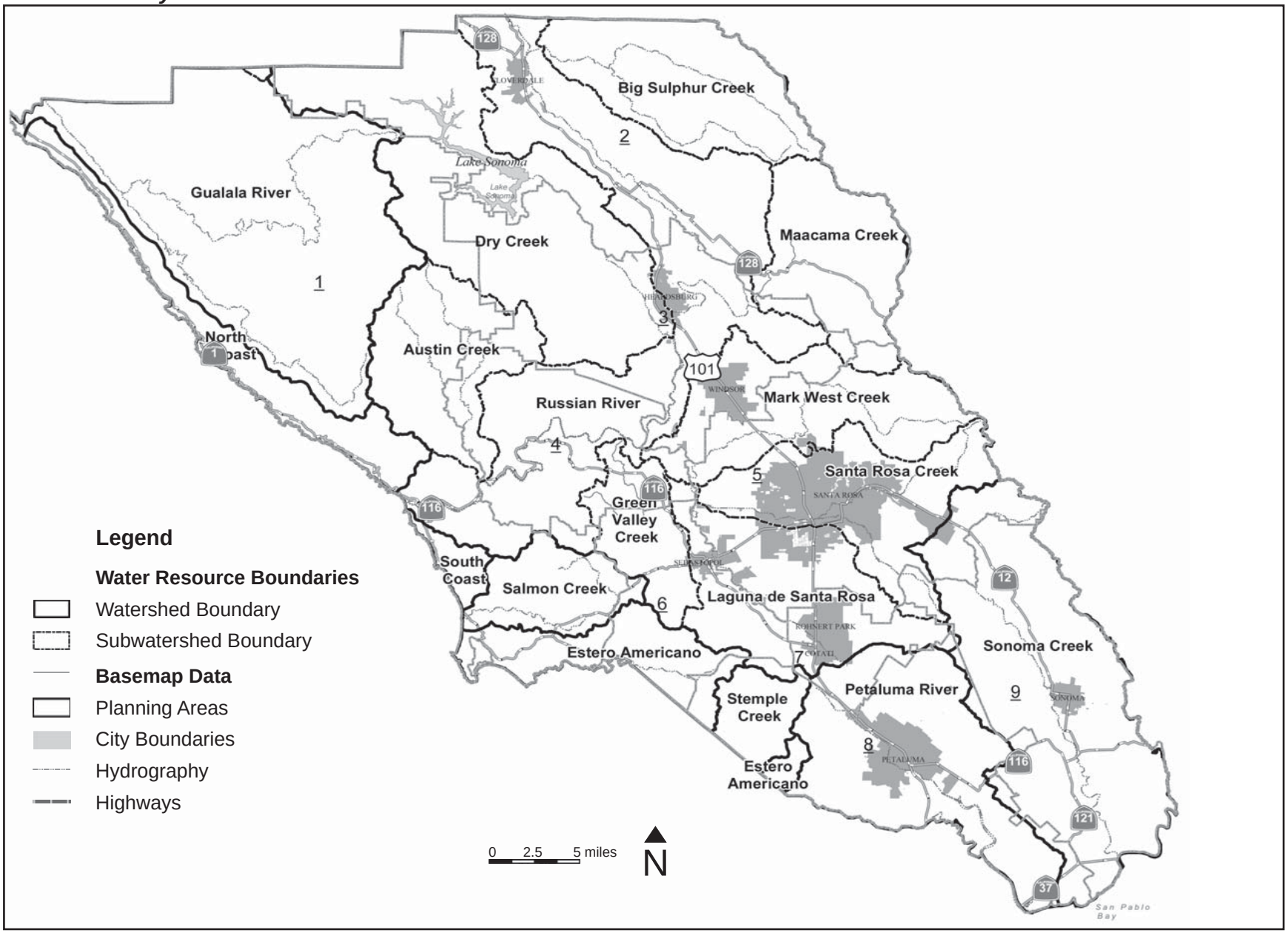
Potential Groundwater Management Problem Areas

The historic use of groundwater resources in some areas of the county has resulted in a decline of the groundwater table. The significance of potential groundwater problems is unknown because of the lack of a countywide groundwater well monitoring network and a historic database. Preliminary identification of problem areas is based largely on anecdotal evidence, and reports from individual property owners to PRMD. Some of these problematic groundwater supply areas are currently being investigated by PRMD.

Groundwater Basins

There are 11 separate groundwater basins in Sonoma County as portrayed in DWR *Bulletin 118*, which provides summaries of groundwater conditions throughout California. This Bulletin, first published in the early 1970's, was updated in 2003. These basins, formed over geologic time under various conditions, vary in water availability, water quality, and recharge potential. In some cases, the groundwater basins have been divided into groundwater subbasins which have different hydrogeologic characteristics. The groundwater basins of Sonoma County as defined in DWR Bulletin 118 are discussed in this section. **Exhibit 4.5-4** illustrates the location of each groundwater basin while **Exhibit 4.5-5** summarizes each basin's characteristics.

Exhibit 4.5-1
Sonoma County Watersheds and Subwatersheds



Source: Sonoma County PRMD, 2005

Exhibit 4.5-5
Summary of Groundwater Basins

Groundwater Basin (subbasins in italics)	***Surface Area (square miles)***	***Groundwater Availability Class(es)***	***Notes***
Annapolis Ohlson Ranch Formation Highlands	13.5	III	Some wells may go dry in fall months.
Knights Valley	6	I	Usually adequate for domestic use
Alexander Valley			
Cloverdale Area Groundwater Subbasin	10	I & IV	Groundwater elevations may be declining in some areas
Alexander Groundwater Subbasin	37	I, III, & IV	Groundwater levels relatively stable
Santa Rosa Valley			
Healdsburg Area Groundwater Subbasin	24	I, III, & IV	USGS currently conducting studies
Santa Rosa Plain Groundwater Subbasin	125	I & III	Groundwater levels have declined in the past in some areas
Rincon Valley Groundwater Subbasin	9	I & III	
Bodega Bay Area		IV	Limited information available
Wilson Grove Formation Highlands		II, III, & IV	Well yields may be low in fall months in some parts of the basin
Lower Russian River Valley	10	I, IV	Mostly high yield
Fort Ross Terrace Deposits		III & IV	Variable yields
Petaluma Valley	70	I, III, & IV	City conducting a groundwater assessment as part of their General Plan process.
Napa-Sonoma Valley			
Sonoma Valley Groundwater Subbasin	70	I	USGS currently conducting studies
Napa-Sonoma Lowlands	65	III & IV	Potential problems with salt water intrusion
Kenwood Valley	8	I	Some concerns over local well interference effects and water level declines

Sources: (1) *California's Groundwater – Bulletin 118*, Department of Water Resources, 2002. (2) Groundwater availability classes were obtained from the 1989 Sonoma County General Plan.

Annapolis Ohlson Ranch Formation Highlands Groundwater Basin

The Annapolis Ohlson Ranch Formation Highlands (AORFH) groundwater basin, located in northwestern Sonoma County and surrounding the community of Annapolis, has a total surface area of approximately 13.5 square miles. The formation is defined by the areal extent of a group of disconnected, uplifted sedimentary deposits of the Ohlson Ranch Formation. This groundwater basin has been classified as a Class III groundwater area in the *existing General Plan*. Franciscan rocks, which surround the AORFH, are shown as groundwater availability Class IV. Generally only limited supplies of groundwater occur associated with fractures in these rocks, and in alluvial deposits of some small valleys along stream tributaries. The DWR Bulletin indicates that some wells located in the Ohlson Ranch Formation may go dry in fall months, especially following successive dry years.

Knights Valley Groundwater Basin

The Knights Valley (KV) groundwater basin, located just west of the Sonoma / Napa County line, has a surface area of roughly six square miles and extends from the confluence of Briggs Creek and McDonnel Creek to the small community of Kellogg. This basin has been classified as a Class I groundwater area. The valley bottom is also an important recharge area. Younger alluvium is the primary water-bearing unit of the basin. Well yields in the alluvium are usually adequate for most domestic uses.

Alexander Valley Groundwater Basin

The Alexander Valley (AV) Groundwater Basin has been divided into two separate subbasins: the Alexander subbasin to the south and the Cloverdale area subbasin to the north. A thin section of water-bearing materials marks the boundary between these two subbasins. The SCWA and the USGS are currently conducting a study to characterize groundwater conditions within this basin.

Cloverdale Area Groundwater Subbasin

The Cloverdale Area subbasin extends from Alderglen Springs and the small community of Preston in the north, to roughly two miles south of the town of Asti in the south. Cloverdale and Geyserville are located in this subbasin. Both obtain their water from well fields along the Russian River system. The subbasin extends over ten square miles and has a similar geologic composition to that of the Alexander subbasin, with the primary water-bearing units comprised of alluvium, the Glen Ellen Formation, and some areas of Sonoma Volcanics. The valley area is a Class I groundwater availability area, and the mountains to the east and west, (underlain by Franciscan Assemblage rocks) are a Class IV groundwater availability area. Two DWR groundwater monitoring wells in the vicinity of Cloverdale indicate that groundwater elevations in this subbasin may be declining.

Alexander Groundwater Subbasin

The Alexander subbasin occurs from about two miles south of Asti, to approximately five miles southeast of the small community of Jimtown. The subbasin has a surface area of 37 square miles and is comprised of a composite of late Tertiary to Quaternary age volcanic rocks and continental sedimentary deposits. The subbasin includes alluvium, the Glen Ellen Formation, and the Sonoma Volcanics. The upper half of this subbasin along the alluvial plain of the Russian River has been classified as a Class I groundwater availability area. The alluvial plain of the Russian River is a major recharge area for this subbasin. Mountainous areas adjacent to the lower half of the subbasin, south of the bend of the Russian River near the communities of Jimtown and Lytton, are classified as a Class III and Class IV groundwater area with variable well yields. A DWR groundwater monitoring well in the lower half of this subbasin indicates that groundwater levels are relatively stable in this area.

Santa Rosa Valley Groundwater Basin

The Santa Rosa Valley (SRV) groundwater basin has been divided into three separate subbasins: the Santa Rosa Plain Subbasin; the Rincon Subbasin; and the Healdsburg Area Subbasin. The Santa Rosa Plain Subbasin, the largest of the three subbasins, is separated from the Healdsburg Subbasin by the Russian River plain and from the Rincon Valley Subbasin by a narrow constriction formed in the bedrock of the Sonoma Volcanics. The subbasin adjoins the Petaluma Valley subbasin to the south, in the Penngrove area.

Healdsburg Area Groundwater Subbasin

The Healdsburg Area Subbasin is located northwest of the Santa Rosa Plain Subbasin and has a surface area of approximately 24 square miles. The subbasin is made up of alluvium, the Glen Ellen Formation, alluvial fan and terrace deposits, and the Wilson Grove Formation. The alluvium, comprised of unconsolidated permeable deposits of Holocene age, is found underlying the Russian River, Dry Creek, and other tributaries. These deposits produce a high yield, and are the primary source of water supply for the City of Healdsburg, which is located on major natural recharge areas of the subbasin. This subbasin has been characterized as a Class I groundwater area. The mountainous areas to the west and east of Healdsburg are groundwater availability Class IV areas, while the upland areas immediately surrounding Healdsburg to the north, northeast, and south are in groundwater availability Class III.

Santa Rosa Plain Groundwater Subbasin

The Santa Rosa Plain Subbasin has a total surface area of about 125 square miles. The Subbasin extends from the Cotati- Rohnert Park area to approximately one mile south of Healdsburg, and includes the greater Santa Rosa urban area.

The subbasin is composed of three water-bearing units: the Wilson Grove Formation (the principal water-bearing unit in the subbasin); the Glen Ellen Formation; and alluvium. The flat alluvial plain intersected by Santa Rosa Creek and its tributaries have been characterized as a Class I groundwater area. This area includes downtown Santa Rosa and Windsor, and is a major recharge area for the subbasin. The alluvial plain of the Laguna de Santa Rosa to the west is also a Class I area and a major groundwater recharge area. In the lower basin, groundwater availability is variable. Rohnert Park and Cotati are classified as Class I areas; the area near Penngrove as Class III; and the surrounding hillsides, including the slopes of the Sonoma Mountains as Class III. Urban growth in the Rohnert Park area during the 1970s and 1980s and the use of groundwater as a principal municipal water supply source have been associated with a historical decline in groundwater levels in the southern portion of the Santa Rosa Plain Subbasin. Water levels have stabilized somewhat since the early 1990s, with recharge and pumping currently thought to be in rough equilibrium. [5] In recent years, the City of Rohnert Park switched its primary source of municipal water supply from groundwater to water supplied by the SCWA. [6] The City of Rohnert Park continues to seek an increase in use of SCWA water in order to further reduce its reliance upon groundwater. A Water Supply Assessment

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5 *Groundwater Study for the Canon Manor West Subdivision Assessment District,* Todd Engineers, June 2004.

6 City of Rohnert Park Draft Water Supply Assessment, Winzler & Kelly, October 2004.

recently completely by the City estimates that the combination of SCWA water and groundwater is sufficient to meet the needs projected in the City's General Plan. [7]

Rincon Valley Groundwater Subbasin

The Rincon Valley Subbasin has a surface area of approximately nine square miles. This subbasin is made up of two water-bearing units: the Glen Ellen Formation on the hillsides and alluvium. The Glen Ellen Formation is the major water source in the subbasin. This subbasin is isolated from the rest of the Santa Rosa subbasins by portions of the Sonoma Mountains, which are underlain by the Sonoma Volcanics. This subbasin is designated as a Class I groundwater area and a major natural recharge area, while the uplands bordering the valley are considered to be groundwater availability a Class III areas.

Bodega Bay Area Groundwater Basin

The Bodega Bay Area (BBA) groundwater basin is a coastal basin located in southwestern Sonoma County just north of the Marin / Sonoma County line.

The small community of Bodega Bay has an economy largely dependent upon fishing and tourism. Although the DWR has classified this area as being located within the Bodega Bay Groundwater Basin, information regarding this groundwater basin is limited. Groundwater is contained in generally thin terrace deposits and in fractures in the underlying Franciscan Assemblage rocks. The lack of a large storage volume in these aquifer materials limits the available water supply and subjects this area to water supply problems during successive dry years. Continued growth in areas of limited groundwater that also depends on groundwater can present supply problems to existing wells. In addition, the proximity of this basin to the ocean has lead to problems with saltwater intrusion.

Wilson Grove Formation Highlands Groundwater Basin

The Wilson Grove Formation Highlands (WGFH) groundwater basin is found along the border of Sonoma and Marin Counties. The formation was deposited in a marine environment onto the eroded surface of the underlying Franciscan Assemblage. Groundwater well yields in this basin are variable. Portions of western Sebastopol, Bloomfield, and Graton are located on Class II groundwater availability areas, while the remainder of the basin and adjacent areas where Franciscan Assemblage rocks occur at or near the surface have been characterized as Class III and Class IV areas. Anecdotal evidence indicates that the area surrounding Forestville is a groundwater deficient area, and well yields in this area may be problematic during fall months.

Lower Russian River Valley Groundwater Basin

The Lower Russian River Valley (LRRV) groundwater basin is a long, narrow, meandering groundwater basin that extends from the confluence of Mark West and Windsor Creeks, and the confluence of Porter Creek and the Russian River west to the community of Bridgehaven. The basin, with a surface area of about ten square miles, follows the Russian River corridor and is composed primarily of alluvium, ancient river terrace deposits, and river-channel deposits of Holocene age. Most wells in this groundwater basin produce high yields. This basin along the river valley has been classified as a Class I groundwater availability area, with most of the basin also being identified as an

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7 City of Rohnert Park Draft Water Supply Assessment, Winzler & Kelly, October 2004.

area of relatively high natural groundwater recharge. Mountainous areas above the narrow river valley basin are classified as groundwater availability Class IV areas

Fort Ross Terrace Deposits Groundwater Basin

The Fort Ross Terrace Deposits (FRTD) Groundwater Basin is made up of a series of discontinuous marine terrace deposits along the Pacific coastline. The terrace deposits occur as a series of benches uplifted above sea level since the Pleistocene. Groundwater is contained in the often relatively thin marine terrace deposits, and in fractures in the bedrock formations that underlie the terrace materials. Sea Ranch is the largest community within this basin, but this area obtains most of its water supply from surface sources. Water yields in this groundwater basin are variable. The northern most portion of this basin is a Class III groundwater availability area, with the remainder of the basin considered to be a Class IV area.

Petaluma Valley Groundwater Basin

The Petaluma Valley (PV) Groundwater Basin covers an area of 70 square miles and is composed of sedimentary deposits of marine, continental, and volcanic derivation. Principal water bearing units in the basin consist of alluvium and the Wilson Grove Formation, located mainly along the northwest side of the Petaluma Valley. The alluvial deposits are of both Pleistocene and Holocene age, with the older alluvium being of greater importance, primarily in the northern portion of the Petaluma Valley. Water yields in the Wilson Grove Formation are moderate to very high. The Petaluma River alluvial plain areas have been classified as a Class I groundwater area, with the City of Petaluma located on the major natural recharge areas of the basin. The hillsides surrounding the alluvial plain are predominantly Class III to the east, in the Sonoma Mountains, and Class IV to the west, with limited groundwater contained in older consolidated sediments. Many of the upper watershed lands of the Petaluma basin are underlain by Sonoma Volcanics to the east, or Franciscan rocks to the west, and have limited groundwater resources.

Napa-Sonoma Valley Groundwater Basin

The Napa-Sonoma Valley Groundwater Basin has been divided into two subbasins: The Sonoma Valley Subbasin in Sonoma County; and the Napa-Sonoma Lowlands Subbasin in Napa County.

Sonoma Valley Groundwater Subbasin

The Sonoma Valley Subbasin is located in the southeastern corner of Sonoma County. The subbasin, extending over an area of 70 square miles, is composed of late Tertiary to Quaternary age volcanic rocks and continental sedimentary deposits. Water-bearing units in the subbasin include Sonoma Volcanics, the Glen Ellen Formation, the Huichica Formation, and alluvium. The heart of the subbasin, along the alluvial plain of Sonoma Creek and lower mud flats, are classified as Class I groundwater areas. Sonoma, Schellville, and Valley of the Moon are located in the recharge area of the subbasin. The SCWA and the USGS are conducting a four year study to characterize groundwater conditions within this subbasin.

Bennet Valley is located several miles south of Santa Rosa. Growth and vineyard development that uses groundwater may have strained the limited available water in this area.

Napa-Sonoma Lowlands Subbasin

The Napa-Sonoma Lowlands Subbasin is composed of 65 square miles immediately north of San Pablo Bay. This subbasin consists of the Sonoma Mountains that flank either side of the Sonoma and

Kenwood Valleys. The subbasin has two primary water-bearing formations: the Recent and Pleistocene Alluvial Deposits and the Pleistocene Huichica Formation. The alluvial deposits, consisting of poorly sorted clay, silt, and gravel, generally have low yields. This subbasin is mostly Class III and Class IV areas.

Kenwood Valley Groundwater Basin

The Kenwood Valley Groundwater Basin, located east of the Santa Rosa Valley and the City of Santa Rosa, has an area of eight square miles. The principal water-bearing units in this groundwater basin are Alluvium and the Glen Ellen Formation. This formation is tapped for domestic use by Kenwood and has been characterized as a Class I groundwater availability area, with Class III areas to the south.

Groundwater Areas of Concern

The following areas in the county were studied in a groundwater resources assessment report prepared by Kleinfelder Inc, for the Sonoma County PRMD. [8] As noted in the Kleinfelder report, these areas were selected for study through review of available literature and PRMD staff knowledge of likely areas of concern in the county with respect to groundwater.

West County / Joy Road

The West County / Joy Road area is a rural area located approximately ten to 15 miles west of the City of Santa Rosa. This area is not within an alluvial groundwater basin, as delineated by the DWR. The local geology is Franciscan Assemblage and Wilson Grove Formation rocks, and thus, groundwater-bearing characteristics can vary widely, but are commonly limited. Communities within and surrounding the West County / Joy Road area which may share common groundwater availability problems include Camp Meeker and Occidental to the northeast, Freestone to the southeast, and Bodega Bay to the south.

Mark West Springs / Rincon Valley

The Mark West Springs / Rincon Valley area is located in central Sonoma County, approximately three miles north of the City of Santa Rosa, in the vicinity of the community of Mark West Springs. The area appears to straddle two groundwater basins as delineated by the DWR: the upper Santa Rosa Valley - Rincon Valley Subbasin and the Napa - Sonoma Valley Basin.

Bennett Valley

Bennet Valley is located approximately three miles south of Santa Rosa. The area is located within the Napa – Sonoma Volcanics Groundwater Basin, but contains an alluvial aquifer. Growth and vineyard development that uses groundwater may have strained the limited available water in this area.

To address groundwater basin issues, the Sonoma County Board of Supervisors directed County staff to work with the USGS, the SCWA, and other local stakeholders to develop a cooperative study work program to systematically evaluate groundwater resources within the county's major groundwater basins (the Sonoma Valley, Alexander Valley, Santa Rosa Plain, and the Petaluma Valley basins).

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8 *Summary of Findings, Water Resources Management Data Assessment, Sonoma County, California*, Kleinfelder, Inc. 2001.

Groundwater Studies

The cooperative study is intended to enhance the current knowledge of groundwater resources within Sonoma County and to provide an objective, comprehensive, and scientifically based evaluation of groundwater conditions in the four major groundwater basins. More specifically, the program is intended to:

- Provide a general characterization of groundwater resources and demand for groundwater in significant groundwater basins within the county;
- Update DWR Bulletin 118-4 that describes general groundwater conditions in the largest groundwater basins within Sonoma County;
- Develop conceptual models for selected groundwater basins within the county that describe basin limits, regional aquifer groundwater yield and storage, areas of recharge and discharge, and regional groundwater quality;
- Develop computer models for selected groundwater basins that can be used as planning tools to:
    - Assess the impacts of future groundwater use scenarios;
    - Assist in evaluating the hydrogeologic and water quality impacts to due to changing land use;
    - Estimate groundwater recharge; and
    - Evaluate surface water and groundwater interaction.
- Identify regional areas where groundwater resources are (or in the future may be) threatened due to overdraft and / or poor water quality; and
- Evaluate the relationship between the significant groundwater basins within the county and with water supplies from the Russian River.

Hydrology and Water Resources – Regulatory Setting

Except for water quality issues, most of the regulations affecting water resources (both surface water and groundwater) are contained in the Sonoma County Code and related ordinances, with code enforcement by the PRMD. In many cases however, development and implementation of a local program or ordinance has been mandated by the State of California, or the federal government.

LOCAL REGULATIONS

County Grading Permits and Erosion Control

The Sonoma County Permit and Resource Management Department (PRMD) oversees grading activities in the county, enforcing the County's grading requirements and erosion control provisions of

the Uniform Building Code (UBC), as well as other provisions of the County Code dealing with subdivision and land development. The Sonoma County Board of Supervisors is currently considering the need for a separate grading, erosion and sediment control, and drainage ordinance, although certain provisions of such an ordinance may be addressed in the existing County NPDES stormwater program requirements.

Submittal requirements for a grading permit issued by PRMD include site plans, existing and proposed contour changes, an estimate of the volume of earth to be moved, and soils and / or geotechnical reports. Projects involving grading activities may also require submittal of a drainage plan, especially where alterations to natural drainage ways are proposed or where the project is in a flood prone area. Drainage plans include supporting hydrologic and hydraulic calculations. Most grading activities are also subject to the County's NPDES stormwater program requirements.

Grading permits are also required for most pond and reservoir construction where the SWRCB has authorized appropriation of water for agricultural, recreational, domestic, or other uses.

Vineyard Erosion and Sediment Control Ordinance (VESCO)

In June 1999 Sonoma County adopted a Vineyard Erosion and Sediment Control Ordinance or VESCO, (Article 5, Chapter 30 of the County Code). This ordinance is intended to address soil erosion problems from vineyard planting on steep slopes and erosion prone soils throughout the county. The ordinance requires growers who want to plant or replant a vineyard to notify the County Agricultural Commissioners Office. Three levels of planning and protection are included in the ordinance: Level I- implementation of basic measures for areas with less than 15 percent slopes or for highly erodible soils on slopes less than ten percent; Level II-submittal of a general erosion control plan for slopes over ten or 15 percent (depending on soil erodibility hazard); and Level III- submittal of detailed plans for vineyards proposed on slopes over 30 percent. The ordinance also includes setbacks from streams: 25 feet from top of bank for Level I and 50 feet for Level II and III plans. Setbacks from streams under VESCO cannot be less than stream setbacks required by the County General Plan. The ordinance generally precludes vineyard establishment on slopes over 50 percent. It does not address the planting of other crops, such as orchards or strawberries, on steep slopes. VESCO, as it relates to agricultural resources, is further discussed in ***Section 4.8 Agricultural and Timber Resources.***

Flood Control and Floodplain Management

The County and all of the incorporated cities within the county are participants in the National Flood Insurance Program (NFIP) administered by the Federal Emergency Management Agency (FEMA). The NFIP, born out of the National Flood Insurance Act of 1968, is a voluntary program that aims to reduce future flood damage by adopting and enforcing floodplain management programs. The NFIP is comprised of three components: Flood Insurance Rate Maps (FIRMs); flood insurance; and floodplain management. The FEMA FIRMs identify flood plain hazard areas prone to flooding during major storm events. The FIRMs are used by insurance companies to set flood insurance rates and by local municipalities for implementing flood-control ordinances which govern new development.

Chapter 7B (Flood Damage Prevention Ordinance) of the Sonoma County Code discusses general and specific flood prevention standards to prevent flood damage within the county. Such measures apply to all structures or land constructed, located, extended, converted, or altered within special flood hazard areas in the county, as identified on the FEMA floodplain maps. The code section on Floodplain Management is based on the model FEMA program, and is focused on prevention of placement of fill, buildings and other obstructions in regulatory floodways (the zone along a channel

where flow moves with depth and velocity and where obstructions can cause the most damage) and on raising building elevations in floodplain areas to be above the 100-year flood.

A special provision of the Sonoma County floodplain management ordinance generally precludes the importation and placement of fill in unincorporated areas of the Laguna de Santa Rosa surrounding the cities of Rohnert Park and Cotati. The intent of this provision (termed *no net fill*) is to protect the natural floodplain storage functions of this area.

In spite of existing flood problems, implementation of Flood Hazard policies of the *1989 General Plan* have likely reduced flooding and flood damage by limiting the extent and kind of new construction and other land activities in flood hazard areas identified by FEMA. Additionally, review of development projects with respect to impacts on flood flows and increase in peak runoff have resulted in appropriate mitigation and decreased the likelihood of increased flood hazards from new development. However, flooding and flood damage are still a major problem in Sonoma County.

The Sonoma County Water Agency was formed in 1949 with the primary responsibilities to produce and furnish water for beneficial uses, water conservation, and flood management. Nine geographical zones, each encompassing a major watershed, were proposed in 1958 as a means of financing the construction and maintenance of flood control works in the county. To date, eight of these zones were officially formed and six zones are currently active as shown in **Exhibit 4.5-6**. The agency works cooperatively with the incorporated cities, unincorporated communities, and the State and federal government to oversee flood control channel modifications and flood control revenue collection within the six active zones. The SCWA also conducts drainage investigations and develops and implements drainage and flood improvement plans for areas, often working cooperatively with cities to address drainage problems common to both incorporated and unincorporated areas within the Flood Control Zones.

The California Division of Safety of Dams has established specific requirements with respect to dam operation. The California Government Code requires dam operators to prepare emergency plans for dam failure and evacuation. The contingency plans are updated every two years and submitted to the State Office of Emergency Services for review and comment.

Incorporated cities are responsible for developing contingency plans for State-designated dams affecting incorporated areas. Sonoma County has the responsibility for developing emergency plans for State-designated dams affecting unincorporated areas within the county. SCWA also reviews development applications when referred from a city for projects within incorporated cities, for compliance with its Flood Control Design Criteria. This manual provides hydrologic and hydraulic analysis and design procedures, criteria, and standards for drainage and flood control projects.

Exhibit 4.5-6
Sonoma County Flood Control Zones

Flood Control Zone	*Area*
1A	Laguna de Santa Rosa, Mark West Creek
2A	Petaluma Creek
3A	Upper Sonoma Creek
4A [a]	Upper Russian River
5A	Lower Russian River
6A [a]	Dry Creek
7A	North Coastal
8A	South Coastal
9A [a]	Lower Petaluma River and Lower Sonoma Creek

[a] Zones not officially formed.

Source: Sonoma County Water Agency, 2003.

Groundwater Well Permits

There are roughly 40,000 water wells within Sonoma County. PRMD is responsible for granting water well permits throughout the county. As described below, the well permitting process varies depending on the availability of groundwater at the location of the proposed well.

PRMD grants ministerial water well permits for all wells, including agricultural wells, located within Class I, II, III, and IV areas,. For proposed discretionary projects located in Class III and Class IV areas, applicants are required to provide proof of adequate groundwater by means of a geologic report. Discretionary permits are not granted unless the geologic report establishes that groundwater supplies in the vicinity of the proposed well are adequate and will not be adversely impacted by anticipated future development.

While the standards for water well permits in a given groundwater availability area historically have governed only the physical design and location of wells, in certain circumstances applicants also must address the quantity of water proposed to be extracted. Any proposed commercial or industrial project which would rely on a water well and require a use permit, must include a groundwater use estimate prepared by a civil engineer or registered geologist as part of the project application. If the proposed project would use more than 5 acre-feet per year, the applicant must equip the water well with a meter and submit annual groundwater monitoring reports to PRMD.

In addition, the County has adopted well pump test requirements for certain wells in water scarce areas. Before obtaining a building permit for either a second dwelling unit in a Class III or for a residential dwelling unit in a Class IV area, an applicant must perform a well pump test to establish that the well yield will supply enough water to sustain the proposed construction.

Despite these recent modifications to the well permitting process, well permits generally continue to focus primarily on the physical design and location of wells and do not govern the quantity of water extracted or the long-term capacity of the underlying aquifer to supply groundwater. Under the direction of the Board of Supervisors, PRMD is currently revising the county well permitting program to include additional criteria and guidelines.

STATE AND FEDERAL REGULATIONS

State and Federal Water Supply and Water Quality Regulations

The Environmental Protection Agency (EPA) is the federal entity in charge of establishing and enforcing fundamental water quality regulations in the United States. The EPA is also in charge of public health and the environment by setting standards for drinking water contaminants and protecting sources of drinking water under the Safe Drinking Water Act of 1974. The EPA develops minimum standards and the states then develop individual programs that best meet their unique needs, consistent with or exceeding the federal minimum standards. The EPA is also responsible for monitoring state adherence to the minimum federal standards.

California has a separate Water Code that provides details on the programs, regulations, and procedures for the development, protection, use, and management of the State's water resources. With the passage of the Porter-Cologne Water Quality Control Act by the State of California in 1969, the State Water Resources Control Board (SWRCB) and the nine Regional Water Quality Control Boards (RWQCBs) became the principal State agencies with responsibility for the coordination and control of water quality. Per the Water Code, the SWRCB is generally responsible for setting statewide water quality policy and is solely responsible for the allocation or determination of surface water rights. The RWQCBs are responsible for water quality planning and regulatory decisions for their respective regions. Sonoma County is located within the jurisdiction of two RWQCBs: the North Coast (Region 1) RWQCB, and the San Francisco Bay (Region 2) RWQCB, which includes the Petaluma River and Sonoma Creek. The RWQCBs have the authority to implement water quality protection standards through the issuance of permits for discharges to waters at locations within their respective jurisdictions. Their jurisdiction also extends to discharge of wastes and wastewater to land, and to land disturbance, if the activities could affect the beneficial uses of surface water or groundwater.

Regulation of public drinking water supply, including the protection of supply source areas, and monitoring and assessment to insure that an adequate municipal or public supply is provided and managed for health and safety, is under the jurisdiction of the State Department of Health Services (DHS). Under California Water Code section 350, DHS can direct that a water supplier (both public and private) declare a water supply emergency, either on a short term basis, during an extended drought, or on a long term basis, where there is evidence that the available water supply may not be able to meet existing public needs, especially for drinking water, sanitation, and fire protection. In these situations, moratoria on new public water connections may be ordered until an adequate supply is insured. Currently there are no such water supply impairment declarations or water supply emergencies in Sonoma County.

The State Department of Water Resources (DWR) is the State agency responsible for managing California's water resources other than water quality, including conducting technical studies of surface water and groundwater in cooperation with local agencies, overseeing certain flood prevention and floodplain management programs, and developing and implementing water conservation and efficient water use strategies and programs in cooperation with local agencies. DWR is also responsible for building, operating, and maintaining the State Water Project, which supplies drinking water and agricultural irrigation water to various parts of the state, but not to Sonoma County. DWR has also been given the responsibility for overseeing the preparation of Groundwater Management Plans.

NPDES Program

The SWRCB and the nine RWQCBs implement the State and federal clean water laws, including the National Pollutant Discharge Elimination System (NPDES) permitting process. The program

regulates point sources discharges from industrial, municipal, and other facilities if their discharges go directly to surface waters. In 1987, the NPDES program also began a phased approach to addressing non-point source pollution from streets, parking lots, construction sites, homes, businesses and other sources.

Under Phase I of the NPDES stormwater program, all medium separate storm sewer systems (serving a population of 100,000 – 249,000) and large separate storm sewer systems (serving a population of 250,000 or more) were required to obtain a municipal permit. Under Phase II of the NPDES program, small storm sewer systems are also required to obtain coverage under a Regional Board-issued permit as of August 8, 2003. A small storm sewer system is defined as any unpermitted municipal separate storm sewer system located in an urbanized area with a population of 50,000 and a population density of 1,000 per square mile. In Sonoma County, the City of Santa Rosa and unincorporated urban areas surrounding Santa Rosa are part of the Phase I NPDES stormwater program area. All of the cities except Cloverdale and the unincorporated urban areas surrounding Petaluma and Sonoma are in the Phase II program.

Sonoma County, the SCWA, and the City of Santa Rosa have been issued a joint NPDES Phase 1 Municipal Stormwater Permit by the North Coast RWQCB. The permit, renewed every five years, requires the permittees to develop and implement programs to protect stormwater quality. Programs focus on public and private construction, municipal operations, illicit discharge detection and elimination, public education, and post development stormwater controls. The Phase I Program, which originally covered the City of Santa Rosa and adjacent urban areas, was expanded under Phase II to cover a much larger portion of the unincorporated area around Santa Rosa. Other NPDES Phase II areas include urban areas within and surrounding Rohnert Park, Cotati, Sebastopol, Healdsburg, Windsor, Petaluma and Sonoma. The County and the SCWA are copermittees under the Phase II general permit for unincorporated areas in Sonoma Valley and Penngrove which are under the jurisdiction of the San Francisco Bay RWQCB. Programs similar to the Phase 1 activities are implemented in these areas. The County is responsible for Phase II program development and management in unincorporated areas.

The NPDES program is the basis for the County's Storm Water Quality Ordinance (Ordinance Number 4981). Violations are considered misdemeanors and public nuisances and may be subject to court orders, fines, and reimbursement of County costs and damages.

The NPDES permit program also affects construction sites that disturb one acre or more. Under the Phase I NPDES stormwater program, construction sites that are larger than five acres were required to obtain a General Construction Activity Stormwater Permit. Under the Phase II NPDES program, which went into effect on March 10, 2003, construction sites disturbing between one and five acres of land are also required to obtain coverage under the General Construction Activity Stormwater Permit. Permit applicants are required to prepare a Stormwater Pollution Prevention Plan (SWPPP), implement construction-related BMPs, monitor discharges, and implement post-construction BMPs. Typical construction BMPs include temporary soil stabilization measures (e.g., mulching, seeding); storing materials and equipment to ensure that spills or leaks cannot enter the storm drain system or storm water; and using filtering mechanisms at drop inlets to prevent contaminants from entering storm drains. Typical post-construction management practices include street sweeping and cleaning of stormwater inlet structures.

In June 2005, the County, the SCWA, and the City of Santa Rosa adopted a joint agency *Standard Urban Stormwater Mitigation Plan* (SUSMP). The SUSMP is a requirement of both the NPDES Phase I and Phase II permits. The SUSMP applies to applicable projects within the unincorporated and urbanized areas surrounding the Cities of Santa Rosa, Petaluma, and Sonoma.

SUSMP substantially changed development practices by requiring applicable projects to design and implement post-development measures to reduce stormwater pollution. Prior to SUSMP, projects were designed to improve site drainage and to prevent flooding. Under SUSMP, project plans now need to include water quality design improvements that will, to the maximum extent practicable, prevent or reduce pollution that is generated on-site before being carried off-site in stormwater runoff. The SUSMP has several key objectives: to minimize and / or retain natural absorption and purification of stormwater by soil and surface vegetation; prevent erosion in creek channels; protect sensitive aquatic areas; prevent increases in pollutants to creeks, especially pollutants listed as impairing local creeks; and prevent the discharge of non-stormwater discharges to storm drain systems.

TMDL Program

In addition to the NPDES program, the RWQCBs also implement the federally-mandated Total Maximum Daily Load (TMDL) program for each of the watersheds. The term TMDL is used by the RWQCBs and the EPA to identify, on a stream-specific basis, pollutant limitation standards. Resource and regulatory agency staff use the term TMDL to refer to both the definition of the regulation and the planning process to achieve compliance, as well as the actual pollutant standard.

The technical definition of a TMDL is the "sum of the individual wasteload allocations for point sources, load allocations for non-point sources and natural background pollutants, and an appropriate margin of safety." As a process, TMDLs serve to identify impaired water bodies, determine the sources for this impairment, and implement mitigation measures to reduce those sources and remove impairments. This process has several formal steps including Problem Statement, Source Allocation, and Implementation Plan development. Public input and comment is sought at each of these steps.

The TMDL document is a written, quantitative assessment of water quality problems and contributing pollutant sources. It specifies the amount of pollution reduction necessary to meet water quality standards, allocates the necessary pollutant limits among the various sources in the watershed, and provides a basis for taking actions needed to restore a waterbody. TMDLs range from ten to over 100 pages in length, depending on the complexity of the issues. The goal of a TMDL is to attain water quality standards.

In Sonoma County, TMDLs have been completed for the Gualala River and are well underway for Sonoma Creek, and the Russian River and its major tributaires. The RWQCB is in the early planning stages for development of TMDLS for the Petaluma River and most of the coastal streams.

Watershed Management Planning and Regulation

The water resource protection efforts of the SWRCB and the RWQCBs are guided by the Watershed Management Initiative (WMI). The WMI is designed to integrate various surface and groundwater regulatory programs while promoting cooperative, collaborative efforts by various agencies and interest groups within a watershed. The WMI takes a watershed management approach for water resources protection by integrating point and non-point source discharges, ground and surface water interactions, and water quality/water quantity relationships. The SWRCB has worked with each individual RWQCB in identifying the major watersheds in each region, prioritizing water quality issues, and developing watershed management policies focused on protecting beneficial uses of water. In Sonoma County, the San Francisco Bay RWQCB has jurisdiction over the Sonoma Creek and Petaluma River watersheds and the North Coast RWQCB has jurisdiction over the Gualala River and Russian River watersheds and their tributaries, as well as a number of small watersheds along the coast.

As described above, Section 303(d) of the Federal Clean Water Act, also implemented primarily by the RWQCBs, requires that each state establish Total Maximum Daily Loads (TMDLs) for all waters that are not attaining water quality standards set forth by the EPA (termed impaired water bodies). The TMDL must account for all sources of the pollutants that caused the water to be listed as impaired (e.g., sediment, nutrients, and / or pathogens) and must be established at the level necessary to implement the applicable water quality standards. A discussion of impaired water bodies (creeks and rivers) in Sonoma County is included in the discussion of watersheds and subbasins, above.

Beyond the WMI, Phase II NPDES stormwater management, and TMDL Regional Board managed water quality programs, there is currently no State mandate or County requirement to prepare more general or integrated Watershed Management Plans for large (basin scale) watersheds. However, under Section 64655, of Article 7, Chapter 17 of the California Code of Regulations, the Department of Health Services (DHS), in cooperation with local water suppliers, must complete a Watershed Sanitary Survey for all public water systems that have a surface water source. The Watershed Sanitary Surveys must include information on the physical characteristics of the watershed, identify possible sources or activities which could impact drinking water quality, and include recommendations for management measures and corrective actions. Watershed Sanitary Surveys have been completed for all of the watersheds upstream of surface water supply systems and are on file at the DHS Santa Rosa office.

In addition, local governments that provide or maintain within their boundaries underground drinking water supplies are responsible for developing wellhead protection programs. Wellhead protection programs (including local ordinances and land use control programs for lands immediately surrounding public water supply wells) focus on preventing groundwater drinking water supplies from being contaminated. In Sonoma County, the City of Sebastopol has developed a Wellhead Protection Program which was implemented in coordination with and overseen by the DHS.

A number of more general watershed management plans have been prepared for individual watersheds in Sonoma County. These have typically been prepared by local Resource Conservation Districts (RCDs) in cooperation with local stakeholder groups such as watershed councils, and interest groups such as the Farm Bureau and other agricultural associations and environmental groups. Plans have been prepared for the Petaluma River Watershed, the Sonoma Creek Watershed, and the Stemple Creek Watershed. These plans inventory and identify watershed management problems, such as upland erosion and gullying, stream bank failure areas, and areas of sensitive biological resources (often along creeks), and note areas needing restoration and enhancement. The plans also outline general watershed management goals and objectives, and include recommendations and priorities for tackling identified problems and management needs.

Although RCD authored Watershed Management Plans have no binding legal authority for enforcement or for implementation of their management recommendations, they are valuable in that they provide a framework for setting priorities, and contain an action plan and management strategies. They often serve as a vehicle for attracting follow up State and federal grant funding for implementing specific projects identified in the plans. The Sonoma Ecology Center, acting with the Southern Sonoma Resource Conservation District has been especially successful in developing and implementing projects in the Sonoma Creek watershed.

Plans have also been prepared for the Petaluma River, Santa Rosa Creek, and the Laguna de Santa Rosa by the cities of Petaluma, Santa Rosa, and Sebastopol in cooperation with creek protection and enhancement by non-profit interest groups. These plans focus on protection and enhancement of the immediate creek corridor. Individual restoration, enhancement, and public access projects have been implemented along portions of all of these creeks.

More comprehensive assessments and management plans are under preparation for the Russian River, for the Gualala River, for the Laguna de Santa Rosa, and for the agricultural and open space lands around San Pablo Bay in southern Sonoma County. These are large, multi-year planning efforts that involve many local, State and federal government agencies and interest groups, with overall plan coordination for several of the watershed planning efforts by the Army Corps of Engineers, often in association with the State Coastal Conservancy. These plans and assessments focus on protection of biological resources and fisheries, including endangered species, and will include actions for waterway and wetlands restoration and enhancement. Most of the implementation recommendations will require the voluntary cooperation of private property owners and local government, although funding can come from the federal and state governments.

In addition to larger watershed and stream corridor planning efforts, a number of local environmental interest groups (urban creeks councils and friends of creeks) complete creek inventories and monitor water quality, and sponsor creek clean up days, and local creek restoration and planting programs. The Atascadero and Green Valley Creek Watershed Council is an example of an active non-profit environmental restoration group in the Green Valley watershed area of Forestville and Sebastopol. The Laguna Foundation in Sebastopol is also very active in the preservation, protection, and enhancement of the Laguna de Santa Rosa, as is the Committee for the Restoration of Santa Rosa Creek, in the Santa Rosa area.

Groundwater Management

In California, surface water rights are regulated by the State, while groundwater is managed by a variety of local entities with a wide array of regulatory authority. Most local governments require well permits that primarily address groundwater quality issues and well construction requirements associated with groundwater. Historically, very few local governments, particularly counties, regulate or manage groundwater usage or withdrawals in order to broadly manage these water resources.

Generally, five methods for groundwater management have evolved over time. Groundwater management can be achieved by one of the following entities or methods.

Local Agencies

More than 20 types of local agencies are authorized by the California Water Code to provide water for various beneficial purposes. Many of these agencies also have statutory authority to institute some form of groundwater management. Most of these agencies are identified in the Water Code, but their specific authority related to groundwater management varies. These types of agencies include: Community Services Districts; County Sanitation Districts; County Service Areas; County Water Authorities; County Water Districts; County Water Works Districts; Flood Control and Water Conservation Districts; Irrigation Districts; Metropolitan Water Districts; Municipal Utility Districts; Municipal Water Districts; Public Utility Districts; Reclamation Districts; Recreation and Park Districts; Resort Improvement Districts; Resource Conservation Districts; Water Conservation Districts; Water Districts; Water Replenishment Districts; and Water Storage Districts.

Although the County has the authority to initiate groundwater management, it does not have authority over the above agencies. However, the County could provide management in some areas through its various special water supply, or wastewater districts. The SCWA could also develop and implement groundwater management plans under AB 3030.

Groundwater Adjudication

Another form of groundwater management in California is through court adjudication. The groundwater rights of all overlying property owners and appropriators are determined by the court in basins where a lawsuit is brought to adjudicate the basin. The court also decides who the extractors are; how much groundwater those well owners can extract; and who the Watermaster will be to ensure that the basin is managed in accordance with the court's decree. The Watermaster must report periodically to the court. Such adjudications are difficult to achieve, costly, time consuming, and divisive. There are 19 adjudicated groundwater basins in California, none of which are located in Sonoma County.

Groundwater Management Agencies

Thirteen groundwater management agencies have been directly authorized by special State legislation. These entities vary significantly in why they were created, how they are managed, and what authorities are granted in each case. Many agencies or districts are authorized to influence or regulate groundwater extraction directly. Most agencies can establish zones of benefit and levy fees on groundwater extraction. Still others are primarily focused on groundwater monitoring or water quality management.

Several other established water districts have special legislative authority to manage groundwater actively, and, in certain circumstances, to levy an extraction charge on groundwater use. The SCWA is a Special Water District, but it does not have special legislative authority to manage groundwater.

Local Groundwater Ordinance

Groundwater management is also achieved through local groundwater ordinances. More than 27 counties have adopted groundwater ordinances and other counties are considering doing so. The objectives of these ordinances vary, but many are intended to prevent groundwater from being exported outside the boundaries of the counties of origin. The authority of counties to regulate groundwater has been legally challenged. In 1995, the California Supreme Court declined to review a lower court decision (Baldwin vs. Tehama County) which holds that State law does not occupy the field of groundwater management and therefore does not prevent cities and counties from adopting ordinances to manage groundwater under their police powers. However, the precise nature and extent of the police power of cities and counties to regulate groundwater is uncertain. To exercise these police powers, findings would have to be made regarding public health safety and welfare.

Although Sonoma County does not have an existing groundwater management ordinance, it does have a limited well ordinance which accomplishes some of the same regulatory functions on a more geographically limited basis. Mendocino and Napa Counties have groundwater ordinances.

AB 3030 Groundwater Management Plans

In 1992, the State passed AB 3030 (and later amended it in SB 1938) which provides authority for local water agencies to adopt groundwater management plans if certain procedures are followed. These plans can involve collaboration among numerous agencies and thus offer opportunities for local governments to participate in groundwater management planning in cooperation with water providers. No new level of government is formed under AB3030 and action is voluntary rather than mandatory. The plan is only prepared following a public hearing and the adoption of a resolution. After the plan is prepared, a second hearing is required to determine whether to adopt the plan, and if there is no majority of opposition, the plan can be adopted within 35 days after the second hearing. If the majority is opposed, the groundwater management plan can not be adopted and no new plan may be

adopted for one year. Once the plan is adopted, rules and regulations must be developed to implement it. Many plans that have been adopted are relatively simple and define groundwater basin boundaries for monitoring purposes. The Water Code also provides the local water supplier with the powers of a Water Replenishment District in order to raise revenue to pay for facilities used for basin management (including extraction, recharge, conveyance, and water quality).

The Water Code also provides that a groundwater management plan may include any one or all of the following technical components:

- Control of saline water intrusion,
- Identification and management of wellhead protection areas and recharge areas,
- Regulation of the migration of contaminated groundwater,
- Administration of a well abandonment and well destruction program,
- Mitigation of conditions of overdraft,
- Replenishment of groundwater extracted by water suppliers,
- Monitoring of groundwater levels and storage,
- Facilitating conjunctive use operations,
- Identification of well construction policies,
- Construction and operation by the local water suppliers of groundwater contamination cleanup, recharge, storage, conservation, water recycling and extraction projects,
- Development of relationships with State and federal regulatory agencies, or
- Review of land use plans and coordination with land use planning agencies to assess activities which create a reasonable risk of groundwater contamination. [9]

There are no adopted groundwater management plans in Sonoma County. Recently however, the SCWA Board directed the General Manager / Chief Engineer to prepare a work plan for Board consideration detailing the steps necessary to develop a groundwater management plan under AB 3030 for the Sonoma Valley. The work plan will consider methods to increase the availability of Russian River water or provide recycled water for vineyard irrigation so that current municipal and agricultural groundwater pumping can be reduced.

Additionally, in 2001, the SCWA and USGS initiated a four-year study of the Sonoma Valley and Alexander Valley groundwater basins. The preliminary results of the study indicate that the Sonoma Valley Groundwater Basin is limited in its water-bearing capacity due to its geology and the relatively small size of the basin. In addition, the basin is bounded to the south by saline water (i.e., the San Pablo Bay) which could intrude into the basin. Although there do not appear to be regional overdraft

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[9] AB 3030 (California Water Code Section 10750 et seq.)

issues, there are indications of localized water level declines. The basin is vulnerable to potential water quality degradation from saline water intrusion and localized overdraft if conditions are not carefully monitored or managed in the future given the increasing significance of groundwater for meeting domestic, municipal, and agricultural water supply demands in the Sonoma Valley.

Based on these issues, groundwater management could be a method to help ensure a reliable water supply in Sonoma County.

Hydrology and Water Resources – Significance Criteria

According to the *State CEQA Guidelines*, the project would have a significant hydrology and water resources impact if it would:

- Violate any water quality standards or waste discharge requirements;
- Otherwise substantially degrade water quality;
- Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted);
- Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner which would result in substantial erosion or siltation on- or off-site;
- Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site;
- Create or contribute runoff water which would exceed the capacity of existing or planned storm water drainage systems or provide substantial additional sources of polluted runoff;
- Require or result in the construction of new storm water drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects;
- Place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map;
- Place within a 100-year flood hazard area structures which would impede or redirect flood flows;
- 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;
- Inundation by seiche, tsunami, or mudflow. (Potential impacts of inundation by seiche, tsunami, or mudflow are discussed in ***Section 4.7 Geology / Soils***.)

Hydrology and Water Resources – Impacts and Mitigation Measures

WATER QUALITY

Impact 4.5-1 Water Quality – Residential, Commercial, Industrial, and Public Uses
*Residential, commercial, industrial, and public uses consistent with the Draft GP 2020 could introduce additional non-point source pollutants to downstream surface waters. However, existing regulations and water quality policies and programs contained in the Draft GP 2020 would reduce this to a less-than-significant impact. **(LTS)***

Most of the major streams in the county have been characterized as impaired, and at times, in violation of water quality standards listed in the Basin Plans for one or more pollutants, mainly sediment, nutrients, pathogens and, in some areas, elevated temperature. While many of the pollutants that have impaired Sonoma County's water bodies can be attributed to historical agricultural practices and similar land uses, runoff from development in the unincorporated area has contributed to water quality degradation. Continued impairment of water quality could potentially threaten adopted water quality standards and the beneficial uses of water bodies, as defined by the RWQCBs in the Basin Plans for the North Coast and San Francisco Bay areas.

Development and maintenance of land uses such as residential, commercial, industrial, and public facilities (e.g., roads, schools, energy generation and wastewater facilities) creates additional impervious surfaces and automobile use. Additionally, this development can result in the use of materials that can impair water quality such as fertilizers and pesticides (e.g., for landscaping) and toxic chemicals (e.g., for industrial uses or energy production). Water, typically as rainfall, moves over these impervious surfaces where it picks up and carries away natural (e.g., sediment) and human-made pollutants (e.g., oil, pesticides, etc.) and deposits them into streams, rivers, wetlands, and eventually coastal waters. Runoff from these uses is one component of water pollution known as non-point source pollution (i.e., having many diffuse sources).

Several different types of pollutants, including sediment, organic compounds, nutrients, trace metals, bacteria and viruses, and oil and grease compounds, are common in runoff from these uses. Sediment sources include roads and parking lots, as well as destabilized landscape areas, stream banks, unprotected slopes and denuded or disturbed areas. Sediment also transports pollutants such as trace metals, nutrients, and hydrocarbons that attach to each particle. Organic compounds are derived from automotive fluids, pesticides, and herbicides. Nutrients include nitrogen, phosphorus, and other organic compounds that can be found in organic litter, fertilizers, food waste, sewage, and sediment. Sources of trace metals include motor vehicles, roofing and construction materials, and chemicals. Animal wastes, sanitary sewer overflow, and trash handling areas can contribute bacteria and viruses. Sources of oil and grease compounds include motor vehicles, food service establishments, and fueling stations. Water quality impacts related to soil erosion and sedimentation are discussed in *Impact 4.5-2 Water Quality – Soil Erosion and Sedimentation Related to Construction*.

Increased growth would increase urbanization and the conversion of vacant open lands to areas with increased impervious surface area. As the *Draft GP 2020* employs an urban centered growth strategy, its implementation would result in an increase in urban-type development in the unincorporated area mostly within either the unincorporated USAs or within the unincorporated portion of the USAs of the county's nine cities. However, some increase in residential, commercial, industrial, and public uses would also take place in rural areas.

Such development would result in an increase in pollutants associated with runoff as described above. Therefore, the water quality of streams within or adjacent to either the unincorporated USAs or within the unincorporated portions of the USAs of the nine cities would likely be further degraded by urban land use activities. In general, the coastal communities and smaller isolated rural communities would be expected to experience the least amount of population increase. Therefore, the majority of coastal streams would experience relatively less adverse changes to water quality resulting from implementation of the *Draft GP 2020*.

As described in the setting section, the NPDES Phase I and II stormwater permitting programs regulate municipal storm drain systems, industrial facilities, and construction sites. Under the NPDES permitting program, the preparation and implementation of Stormwater Pollution Prevention Plans (SWPPPs) are required for construction activities. Project applicants may also be required (depending on the nature of the project) to develop a long-term SWPPP or a long-term Stormwater Management Program (SWMP) to cover potential storm water pollution associated with site development after construction. The long-term SWPPP and / or SWMP must identify potential sources of pollution that may be reasonably expected to affect the quality of stormwater discharges as well as identify and implement BMPs that ensure the reduction of these pollutants during stormwater discharges. For most commercial and residential development, the NPDES program requirements apply only to storm water pollutants within runoff during construction activities. The program does not require long-term water quality BMPs upon project completion.

The *Draft GP 2020* Water Resources Element contains several policies designed to protect and improve water quality in the unincorporated area. Many of the policies focus on fostering better communication and coordination among all of the agencies and interest groups that have a role in water quality management. Public education and cooperation between the public, stakeholders, and interest groups in developing County-specific management actions and the implementation of State- and federally-mandated water quality protection programs (such as NPDES stormwater and TMDLs) are of primary importance. In general, the *Draft GP 2020* policies would help to ensure that future urban-type development does not result in an increased violation of water quality standards.

Policy **WR-1a** would call for coordination between the County and regulatory agencies, municipal districts, and stakeholders to develop and implement public education and technical assistance programs. Such programs would educate the public about water quality problems and how their actions have a direct impact on water quality. In addition, education programs would inform the public as to what is currently being done by the County to improve stormwater management water quality while recommending water quality BMPs that can be implemented by the general public.

Policy **WR-1b** would reduce sediment and other pollutants in site runoff from County properties, buildings, and facilities, through the preparation and implementation of a BMP manual for the construction and maintenance of these areas. Similarly, Policy **WR-1g** could lead to new stormwater management regulations in addition to the various existing stormwater, grading, and erosion control regulations. Such regulations would minimize the deposition and discharge of sediment, debris, waste, and other pollutants into surface runoff, drainage systems, and surface water bodies.

Policies **WR-1c**, **WR-1d**, **WR-1e**, and **WR-1f** would also seek to protect water quality by means of coordination with regulatory agencies (i.e., the RWQCB). Policy **WR-1c** would work towards the development and implementation of new stormwater management regulations applicable to new development and redevelopment in unincorporated areas. Policy **WR-1c** would prioritize stormwater management efforts, focusing first on urbanizing watersheds and watersheds with impaired water bodies. Policy **WR-1c,** in conjunction with Policy **WR-1f,** would result in the development and implementation of water quality plans and measures. Policy **WR-1d** would require that the County

support the RWQCB waste discharge requirements for all wastewater systems and point sources. Policy **WR-1e** would focus on coordination with the RWQCB in the development of TMDLs as well as the implementation of measures consistent with TMDL requirements.

Policy **WR-1j** would require the County to seek opportunities for water quality restoration and remediation where water quality is a concern. This policy could potentially involve stream restoration and / or the construction of engineered wetlands.

Policies **OSRC-8a** through **OSRC-8h** of the Open Space and Resource Conservation Element would substantially increase protection for riparian corridors. This added protection would provide increased filtration of pollutants, including sediment, before they reached the county's stream channels. Such protection would further reduce water quality impacts from these land uses.

Adoption and implementation of the proposed policies and programs in the *Draft GP 2020*, combined with current stormwater, grading, and erosion control regulations, would ensure that the impact to water quality resulting from residential, commercial, industrial and public uses consistent with the *Draft GP 2020* would be reduced a less-than-significant level.

Mitigation Measure 4.5-1 None Required.

Impact 4.5-2 Water Quality – Soil Erosion and Sedimentation Related to Construction
Land uses and development consistent with the Draft GP 2020 could result in increased soil erosion and sedimentation during construction activities, thereby degrading water quality in downstream waterways. However, existing regulations and water quality policies and programs contained in the Draft GP 2020 would reduce this to a less-than-significant impact. ***(LTS)***

Implementation of the *Draft GP 2020* could result in the construction of a wide range of uses including residential, commercial and industrial buildings, public facilities (e.g., roads, wastewater, energy production, and landfill facilities), and agricultural related uses (e.g., processing, support, and visitor-serving uses) amongst others. Erosion and sedimentation resulting from construction activities in the unincorporated area could represent a significant source of pollution conveyed in storm water runoff. Grading and other earthmoving activities could alter drainage patterns and therefore have the potential to accelerate soil erosion above natural background rates. Vegetative cover, which acts to stabilize the soil, would generally be removed from areas where earthwork and grading activities would occur during the construction.

Although the construction of most new development would occur on relatively gentle slopes surrounding existing urban areas, the *Draft GP 2020* allows the development of residential and other land uses on hillside areas. Even with the implementation of erosion control measures, development on moderate slopes would be particularly susceptible to increased erosion and sedimentation which has the potential to impair water quality. A high level of attention to the planning and implementation of erosion control measures would be required in these areas. Sediment could also accumulate at the inlets of downstream storm drain system, reducing the system's capacity to convey stormwater. Soil loss from erosion could generate costs to the public associated with the clean up and maintenance of storm drains.

Impacts resulting from development consistent with the *Draft GP 2020* would be reduced by compliance with the existing County building and grading requirements and by the Phase II NPDES permitting requirements described above. In addition, the County's development of a new grading and erosion control ordinance (recently directed by the Board of Supervisors) would help further reduce construction related erosion and sedimentation from both discretionary and ministerial permits.

Policy **WR-1g** would call for minimizing sediment deposition and other pollutants into drainage systems and water bodies. This would help reduce the potential for water quality impacts related to construction activities.

Implementation of Policy **WR-1h** would encourage the County to consider adopting stricter grading standards as needed to avoid sedimentation in stormwater to the maximum extent practicable. Soil erosion is further discussed in ***Section 4.7 Geology / Soils***. **Public Safety Program 2: Drainage, Erosion, and Fire Safety Standards for Subdivisions** (**PS2**) would require amendments to Chapter 25 of the Sonoma County Code to clarify standards for drainage, erosion control and fire safety. The adverse effects to water quality from soil erosion generated by construction activities are addressed by Policy **WR-1h**. Policies **OSRC-11a** through **OSRC-11g** also addresses soil erosion. Additional policies inn the Open Space and Resource Conservation Element protecting riparian corridors and biotic habitat would also reduce future erosion and sedimentation of waterways.

Existing requirements, proposed policies of the *Draft GP 2020*, and future RWQCB regulatory initiatives such as the TMDL program would substantially reduce the extent of erosion and sedimentation from construction activities. Ongoing human use of county watersheds will continue to generate sediments that are transported into county streams. In total, the proposed policies and implementation programs of the *Draft GP2020* in combination with existing regulations would ensure that the impact to water quality resulting from future residential, commercial, industrial and public uses consistent with the *Draft GP 2020* would be a less-than-significant impact.

Mitigation Measure 4.5-2 None Required.

Impact 4.5-3 Water Quality – Agricultural and Resource Uses

Agricultural and resource development (i.e., timber harvesting and mineral resources extraction) land uses consistent with the Draft GP 2020 could result in an increase in sediment and nutrients in downstream waterways. This would be a significant impact. ***(S)***

As described in ***Sections 4.7 Geology / Soils*** and ***4.8 Agricultural and Timber Resources***, agricultural production, timber harvesting, and mineral resources extraction, are economically important land use activities in Sonoma County. Some agricultural practices, resource development, and associated land uses have historically impaired water quality and, on occasion, contributed to the violation of water quality standards in Sonoma County. Such practices and land use activities include hay farming and grazing, dairies and poultry operations, vineyard planting, timber harvesting, quarrying, and sand and gravel extraction.

As outlined in ***Section 4.8 Agricultural and Timber Resources,*** cultivated acreages in Sonoma County are projected to increase by approximately 27 percent by 2020. New vineyard development would be expected to increase by approximately 124 percent in the Sonoma Coast, 85 percent near Knights Valley, and 95 percent in the vicinity of Chalk Hill while projected increases of lesser amounts would occur in other more traditional vineyard-producing areas. Projected vineyard acreages in Sonoma County are presented in **Exhibit 4.5-7**.

Exhibit 4.5-7
Projected Agricultural Cultivation – 2000 through 2020

Region	*2000*	*2002*	*2020 Projected*	*Percent Increase 2002 - 2020*
Sonoma Coast	4,035	4,278	9,578	123.9
Sonoma Valley	6,707	7,109	8,609	21.1
Green Valley	3,443	3,648	4,148	13.7
Russian River/Green Valley	9,932	10,528	12,028	14.2
Dry Creek Valley	9,000	9,539	11,039	15.7
Carneros	5,865	6,216	6,216	0.0
Sonoma Mountain	732	776	776	0.0
Chalk Hill	1,396	1,480	2,890	95.3
Alexander Valley	13,300	14,097	17,097	21.3
Knights Valley	1,415	1,183	2,183	84.5
Other	175	175	375	114.3
Totals	***56,000***	***59,029***	***74,939***	***27.0***

Source: Sonoma County PRMD, 2004.

Such agricultural land uses consistent with the *Draft GP 2020* could be a significant source of soil erosion and sedimentation of downstream waterways, especially when such land use activities occur on steep slopes. These land use activities could also be source of nutrients from excess concentrations of chemicals used in agricultural operations (e.g., fertilizers) containing nitrogen and phosphorous in agricultural runoff. In addition, animal wastes at dairy operations and other areas of concentrated animal management activities could also degrade water quality if improperly managed.

Not all agricultural land uses require discretionary permits from the County, and in fact most do not. The most common agricultural practices and land uses consistent with the *Draft GP 2020* that could contribute to sediment and nutrient deposition would likely include hillside and timberland conversions to agricultural cultivation and the conversion of pasture and hay lands to cultivated crops.

To the extent that the *Draft GP 2020* would continue to allow agricultural uses without permit requirements, such activities could result in the degradation of water quality. In these cases, State and federal water quality programs would have the initiative in dealing with agriculturally related water quality problems. The County would continue to regulate agricultural cultivation pursuant to VESCO and the new grading ordinance. Currently, VESCO addresses erosion associated with vineyard development and replanting through three increasing levels of planning detail and resource protection.

These three levels of planning are dependent upon slope and the erodibility of site soils. Under VESCO, applicants for Level I type of vineyard development (i.e., occurring on less than ten percent slopes with highly erodible soils or on less than 15 percent slopes with less erodible soils) must identify sensitive areas; develop temporary and final erosion control and drainage management practices, and list implementation dates for temporary and final erosion and sediment control measures. Similar requirements are expected of applicants for Level II (i.e., occurring on ten to 15 percent slopes with highly erodible soils and on 15 to 30 percent slopes with less erodible soils) and Level III (i.e., occurring on 15 to 50 percent slopes with highly erodible soils or on 30 to 50 percent slopes with less erodible soils) vineyard development. For Level II and III slopes it is required that the erosion control plan be prepared by a civil engineer or other qualified professional. Provided the conditions of VESCO are met, permits for new vineyards and replants are (and would continue to be) non-discretionary. VESCO generally precludes vineyard development on slopes over 50 percent but does not currently address the planting of other crops, such as orchards or strawberries, on moderate to steep slopes.

From 1999 thru June 2004, 10,661 acres of Level I and 3,168 acres of Levels II and III replants and new vineyards were approved in the County. A summary of vineyard development approved under VESCO between June 1999 and June 2004 is presented in **Exhibit 4.5-8**.

Exhibit 4.5-8
Vineyard Development Approved Under VESCO June 1999 through June 2004

Level I	***Projects***	***Acres***
New	450	3,956
Replant	538	6,705
Total	988	10,661
Level II/III	***Projects***	***Acres***
New	140	2,949
Replant	18	219
Total	158	3,168
Total All	***1,146***	***13,829***

Source: Sonoma County Agricultural Division, Agricultural Commissioner, October 19, 2004.
Available Online: www.sonoma-county.org/agcomm/vesco.htm

The Board of Supervisors recently directed that a new grading ordinance be prepared that would address erosion and sedimentation from all agricultural cultivation that could result in significant sedimentation.

To supplement existing regulations, the *Draft GP 2020* contains policies designed to further reduce water quality degradation in the unincorporated area. Policy **WR-1i** and **Water Resources Program 5: Grading Ordinance and Erosion and Sediment Control** would adopt an erosion and sediment control ordinance for row crops similar to that which is currently required for vineyards under VESCO. Policy **WR-1i** would also allow for the development and implementation of agricultural educational and technical assistance programs and encourage on-site retention and recharge of runoff. Since chemicals that would be used in agricultural operations often bind to soil particles, on-site retention and / or detention could filter out sediment and other pollutants from site runoff, thereby protecting the water quality of downstream waters.

Policy **OSRC-8c** would afford some protection to stream corridors and stream stability as it would provide a set of principles and design standards for setbacks from stream zones, including those portions of stream corridors adjacent to row crops and vineyard planting.

Hydrologic changes, such as increased runoff from agricultural land conversions, could affect stream geomorphology and stream stability (e.g., accelerate stream bank and stream bed erosion or sediment accumulation), particularly if several large conversion projects would occur within the same watershed over a short period of time. Changes in peak runoff rates which modify the two-year channel-shaping flow, and changes in sediment supply (e.g., due to changes in land use activities) would further contribute to watershed instability. These hydrologic effects are often additive in watersheds that have a prior history of disturbance from rural development and intensive agricultural land uses, especially in watersheds that have a high percentage of agricultural cultivation or timberland conversion.

Cumulative hydrologic changes would be greatest when large portions of forested or brushland-dominated watersheds would be cultivated. Cumulative effects resulting from cultivation which could adversely affect the water quality in such streams include runoff, changes to stream geomorphology, and downstream stream instability.

As described in the regulatory setting, timber operations, including the harvesting and / or conversion of hardwoods to agricultural cultivation are primarily addressed at the state and regional level through the Timber Harvest Plan (THP) review program. This program is administered by the California Department of Forestry (CDF) in consultation with the RWQCB and the California Department of Fish and Game (CDFG). The County, interested members of the public, and State and federal agencies, are afforded the opportunity to comment on THPs during the review and approval process.

Although some California counties have supplemented the permit review process for THPs to address important local issues, this has not been the case in Sonoma County. In the late 1990s, Sonoma County submitted an application to the State Board of Forestry for local rules. However, this petition was rejected. The THP permit review process and the Forest Practices Rules may not adequately protect water quality, endangered species, and biological resources along streams. One concern is that the THP preparation and review process does not adequately assess cumulative hydrologic and water quality impacts in each watershed. Therefore, the existing timber harvest regulatory framework may not adequately prevent the degradation of water quality while at the same time limiting the County's authority to do so. As a result, timber harvesting activities consistent with the *Draft GP 2020* could degrade water quality unless properly managed through the State process.

The *Draft GP 2020* contains policies intended to reduce water quality impact related to timber harvesting operations. Policies **OSRC-12c** and **OSRC-12d** would provide for county staff review and comment on THPs when related to the protection of Class III streams and riparian corridors. The *Draft GP 2020* also includes policy **OSRC-12e** which would restrict timber conversions in Sonoma County, thereby reducing future vineyard cultivation on timberlands and potential erosion and sedimentation from this activity. Nonetheless, water quality impacts resulting from timber harvest operations are outside of County jurisdiction, and depending upon the effectiveness of State regulations, may not be fully mitigated.

In contrast, the existing regulatory framework for mineral resources extractions affords the County relatively greater authority over such activities. As previously described in the regulatory setting of ***Section 4.7 Geology / Soils***, these activities are regulated in Sonoma County by the County's Aggregate Resource Management Plan (ARM Plan) and at the state level by the Surface Mining and Reclamation Act. Most mining activities also require the preparation and review of a CEQA document as well as the evaluation of the adequacy of soil erosion and water quality control policies.

Sediment and erosion control plans are an important element of the CEQA review and mine permit process. Many State and federal resource and regulatory agencies participate in the review of such mine reclamation and erosion control plans, in addition to the review of county staff and watershed stakeholders. Therefore, project specific and cumulative adverse changes to water quality resulting from mining activities are generally considered to be adequately addressed through the ARM Plan and the CEQA review process.

Mitigation Measure 4.5-3 In order to further reduce water quality impacts resulting from erosion and hydrologic changes induced by agricultural production consistent with the *Draft GP2020*, additional policies or programs would be necessary. However, policies which would subject agricultural production to discretionary permit requirements may risk the economic viability of agriculture in Sonoma County. In light of the need to maintain the viability of agricultural production as expressed in the existing *General Plan* and in the *Draft GP 2020*, policies and programs which would focus on education and technical assistance in the development of BMPs for production activities would be more feasible.

Mitigation Measure 4.5-3(a) Revise Policy **WR-li** as follows to expand the scope of the educational and technical assistance programs to include BMPs for reducing erosion and sedimentation and runoff rates from cultivated slopes. Revise Policy **WR-1i** as follows:

> **Policy WR-1i**: Implement erosion and sediment control requirements for vineyards and row crops. Develop and implement educational and technical assistance programs for agricultural activities including vineyard and crop production, development of BMPs which focus on reduction of peak runoff rates on all cultivated slopes, and erosion and sedimentation on slopes greater than 35 percent.

Mitigation Measure 4.5-3(b) Revise **Water Resources Program 1: Education and Technical Assistance**, as follows:

> **Program Description**: Develop a public education and technical assistance program that provides property owners, applicants, and the general public with information regarding stormwater pollution, efficient water use, public water supplies, water conservation and re-use, and groundwater. Include the preparation of BMPs for agricultural cultivation that addresses reduction of peak runoff from cultivated slopes and erosion and sedimentation on slopes greater than 35 percent.

Significance After Mitigation While the recommended mitigation measures and other policies and programs of the *Draft GP 2020* would reduce these impacts related to hydrology and water quality for many parts of unincorporated Sonoma County where resource land uses would occur to a less-than-significant level, this would remain a significant unavoidable impact. (**SU**)

Responsibility and Monitoring The Sonoma County Board of Supervisors would be responsible for adopting the revised policy and programs. PRMD and the Agricultural Commissioners Office would be responsible for their implementation.

Impact 4.5-4 Water Quality – Wastewater Disposal

Land uses and development consistent with the Draft GP 2020 could result in sewer- and septic-related water quality problems including the reuse of treated water. However, policies provided in the Draft GP 2020 would adequately reduce such impacts to a less-than-significant level. ***(LTS)***

Conventional wastewater treatment plants, package treatment plans, and failing septic systems could violate water quality standards and / or wastewater discharge requirements. Generally, the RWQCBs issue Waste Discharge Requirements (WDRs) permits for all major point-source discharges, such as municipal wastewater treatment plants and package wastewater treatment plants. All of Sonoma County's treatment plants, including those operated by municipalities or wastewater management districts, are regulated under a WDR permit issued by the RWQCB. The County would be responsible for the water quality of wastewater discharge associated with the plants it operates. In cases where the plants are not directly operated by the County, the County's role would be one of cooperation and coordination with the plants. Water quality problems associated with point source discharges from wastewater treatment plants have historically been infrequent, occurring mostly along the Russian River.

The regulation of privately-operated package wastewater treatment plants that occur in the county could be difficult due to the fact that the financial responsibility for plant operation, maintenance, and potential RWQCB penalties would be in the hands of private districts or property owners. Private owners may lack the financial resources to deal with water quality and maintenance problems when they arise.

Individual septic systems serving individual residences could also degrade water quality. This would be of particular concern in areas where historical development has resulted in a high concentration of older septic systems that are not regularly maintained or upgraded.

Water quality could also be affected by the reuse of treated wastewater from sewer plants for agriculture, landscaping, and other water demands. Depending on the extent of treatment that is applied to the wastewater, overapplication can result in excessive runoff that enters waterways.

The *Draft GP 2020* Water Resources Element contains policies that address water quality issues associated with conventional and package treatment plants and septic systems. Policies **WR-1k**, **WR-1n**, and **WR-1o** would specifically address failing septic systems. In areas with widespread septic system problems that cannot be addressed by on-site maintenance and management programs, Policy **WR-1k** would encourage the assessment as to feasibility of developing new treatment plants and / or the expansion of existing plants. The expansion and / or development of new community wastewater treatment plants would likely involve monetary contributions from all benefiting parties (i.e., local residents). The development of new or expanded facilities is often more cost-effective than the continual maintenance and replacement of failing septic systems.

Policy **WR-1n** would consider the formation of on-site wastewater management districts in areas with significant and widespread septic problems. The wastewater management districts would provide an area-wide framework for the proper design, inspection, repair, maintenance, and management of on-site sewage treatment systems.

Policy **WR-1o** would require that the County actively pursue the abatement of failing septic systems that have been demonstrated to cause a health and safety hazard. Implementation of this policy would require that the County establish violation thresholds, after which the property owner would be required to renovate or replace the septic system.

Policy **WR-1l** would initiate a review of any sewer systems that persistently fail to meet applicable standards. This policy would also apply to conventional wastewater treatment plants and package treatment plants. Where the sewer systems persistently fail to meet standards, the County may deny new development proposals and / or impose strict monitoring requirements. Policy **WR-1l** would affect new development proposals in areas where treatment facilities would have inadequate capacity, would be in need of maintenance, or would require a retrofit to meet new requirements.

Policy **WR-1m** specifically addresses commercial and industrial facilities. Implementation of this policy would encourage pretreatment and waste load minimization of commercial and industrial wastes prior to their connection to sewer systems. This policy would reduce the discharge of pollutants from commercial and industrial facilities that would not be easily or fully removed during wastewater treatment. This in turn would improve the quality of treated wastewater that would be discharged into county waterways.

Policies **WR-4a** through **WR-4o** include an array of measures that would encourage conservation and re-use of treated water. These policies would generally contribute to a reduction in the amount of wastewater discharged to waterways from wastewater treatment plants. Policy **WR-4l** in particular would provide that the quality of treated water be appropriate for beneficial uses. These policies would help reduce the potential for water quality impacts from wastewater systems.

Adoption and implementation of the relevant policies of the *Draft GP 2020* would assure that impacts associated with failing sewer and septic systems would be reduced to a less-than-significant level. Sewer and septic systems are further discussed in ***Section 4.9 Public Services***.

Mitigation Measure 4.5-4 None required.

GROUNDWATER

Impact 4.5-5 Groundwater Level Decline

Land uses and development consistent with the Draft GP 2020 would increase demand on groundwater supplies and could therefore result in the decline of groundwater levels. This would be a significant impact. ***(S)***

Existing and future land uses and development in unincorporated areas outside of the USAs have and would continue to be highly dependent on individual groundwater wells and small or independent water companies that rely on groundwater as their primary source of water supply. Ultimately, the sustainability of groundwater supplies would require that the volume of water cumulatively drawn from an aquifer not exceed the volume of groundwater recharge. If this water balance is not maintained over the long term, groundwater levels could eventually drop, resulting in the need to lower pumps, deepen wells, or drill new wells. Over time, groundwater supplies could be severely depleted and local aquifers may no longer be a dependable source of water. Class III and Class IV areas that could not maintain sustainable yields would likely be the first to experience groundwater shortages and dry wells. Eventually this problem could become widespread throughout major and secondary groundwater basins, especially during periods of prolonged drought.

As discussed in the setting section, anecdotal evidence indicates groundwater declines have already occurred in some areas of the county. In the past, groundwater levels have declined in some areas, but this trend has been reversed or partially reversed by reductions in pumping. One issue that makes the management of the County's groundwater difficult is the current lack of a comprehensive inventory, assessment, and understanding of groundwater resources throughout the county. The availability and

quality of groundwater as well the effects of historical and present use are largely unknown. Therefore, the long-term viability and adequacy of groundwater supplies necessary to serve land uses and development consistent with the *Draft GP 2020* is uncertain.

An assessment of groundwater resources in the major basins was last performed in the 1970s by the DWR and may not accurately represent existing conditions. SCWA and the US Geological Survey are conducting groundwater studies in the Alexander Valley and Sonoma Valley areas while the County has conducted studies in a number of smaller problem areas outside of these basins. Some of the cities such as Rohnert Park and Petaluma have also completed groundwater assessments for their portions of groundwater basins on which they rely.

The protection of major groundwater recharge areas is an important management tool for the protection of groundwater resources. Large areas of the county contain soils with high clay content that have poor infiltration and recharge characteristics or are underlain by hard bedrock formations that do not contain sizable groundwater bodies. In such areas, the majority of groundwater recharge occurs along streams. Significant portions of major recharge areas consist of permeable soils overlying important regional aquifers such as the Wilson Grove Formation. Major recharge areas are typically located along valley floors and are predominantly urban areas and / or areas where urban and suburban growth would occur, such as Sebastopol, Santa Rosa, and the northwest side of Petaluma. Volcanic rock formations, such as those that occur in the Sonoma Mountains, can also serve as important recharge areas. Urban development and the resultant increase in impervious cover over these recharge areas has historically reduced natural recharge opportunities. Implementation of the *Draft GP 2020* would result in the construction of additional impervious surfaces. Therefore, the protection of the remaining recharge areas for these important aquifers will play an important role in assuring long-term sustainability in terms of both quality and quantity.

The *Draft GP 2020* includes several policies and implementation programs that would improve groundwater management practices and protect groundwater resources. Policies **WR-2a** and **WR-2b** would be implemented as part of the **Education and Technical Assistance Implementation Program**. Implementation of Policy **WR-2a** would support research that would monitor local groundwater conditions, aquifer recharge, watersheds, and streams. Policy **WR-2b** would initiate an educational program to inform residents, agriculture, businesses and other groundwater users of BMPs in the areas of efficient water use, water conservation, and increasing groundwater recharge.

Policies **WR-2c**, **WR-2d**, and **WR-2e** involve revisions to the current regulations regarding well permits and procedures and would provide for improved data collection and monitoring of groundwater supply and quality. Specifically, Policy **WR-2c** would instill new requirements for all permits to drill, replace, deepen or repair wells. The new requirements would include a clear description of proposed and existing well locations, depths, yield, drilling logs, soil data, flow direction, and water levels of proposed and existing wells on the site. This information would then be made available to applicants, to the extent allowed by the law, under the groundwater database and monitoring program established by policies of the *Draft GP 2020*. Policy **WR-2c** would require that setbacks be developed based on well size, location of nearby wells, water use, groundwater availability, lot size, and other appropriate factors. In Class III and Class IV areas, this policy would also require proof that local groundwater quantity and quality would be sufficient for the proposed uses and existing beneficial uses. Policy **WR-2c** would also require monitoring for all future wells (i.e., through meters and testing) to report water levels, flow direction, and water quality. Where applicable, actions performed under this policy would be consistent with adopted groundwater management plans.

One of the purposes of Policy **WR-2d** would be to avoid overdraft conditions in Class III and Class IV areas throughout the county. Policy **WR-2d** addresses the groundwater impacts of discretionary projects and would be similar to Policy **WR-2c** in that it would require proof of groundwater with a sufficient yield and quality to support proposed uses in Class III and Class IV areas. This policy would require that test wells be established for community water systems in Class IV water areas and possibly in Class III areas where groundwater availability is not well understood.

Implementation of Policy **WR-2e** would revise the procedures for proving adequate groundwater for discretionary projects. The policy would add appropriate criteria regarding study boundaries, review procedures, and regional groundwater supplies and surface water flows.

Policy **WR-2f** addresses groundwater recharge and how it could be reduced by increases in impervious surfaces. This policy would require that discretionary projects maintain or increase the site's pre-development absorption of runoff to recharge groundwater to the maximum extent practicable. This policy, which would presumably be implemented as a condition of approval during a project's CEQA review phase, would provide a general protection of groundwater recharge areas. However, small development projects which do not require discretionary approval, such as individual residences, would not be subject to these conditions. Such development could adversely affect groundwater recharge in areas in which it would occur.

Groundwater monitoring and the collection of groundwater data would be an important component of the *Draft GP 2020*. The **Groundwater Monitoring and Annual Report Implementation Program**, which includes Polices **WR-1s**, **WR-2g**, **WR-2h**, **WR-2i**, **WR-2j**, and **WR-2k**, would result in the development of a groundwater database and monitoring program consisting of well permit data and groundwater basin studies. This program and the policies that comprise it would facilitate evaluation of current groundwater conditions. This program would also include the preparation of an annual report to the Board of Supervisors to assess the current status of groundwater conditions in unincorporated areas of the county.

Policy **WR-2g** would support the establishment and maintenance of a system of monitoring wells throughout the county by the County, SCWA, and other agencies. The system would utilize existing wells where feasible.

Policy **WR-2h** would establish a computerized groundwater database from available application data, well tests, monitoring results, study reports and other sources. This data would be provided to the DWR and would be used to refine the mapping of groundwater availability classes.

Policy **WR-2i** would identify areas where groundwater supplies may be declining through the review of well permit and monitoring data. This data would be used to report problems and make recommendations to the Board of Supervisors regarding areas that need further study in the annual report. For each special study area approved by the Board of Supervisors, a comprehensive groundwater assessment would be conducted that would include: the establishment of a system of monitoring wells and stream gages; identification of all water wells within the study area; the collection and presentation of available groundwater levels and contamination; the preparation of maps and graphics that show past and present data and changes in relevant variables such as precipitation, surface water imports, groundwater levels, groundwater quality, and rates of extraction; use of drillers logs and other geologic data to estimate water yields in an area; estimation of future rates of imports, recharge, extraction, changes in groundwater levels and possible changes in groundwater quality; determination of any needed changes in well monitoring, data collection, and reporting; and provisions for applicant fees and other funding to help cover costs of such an

assessment. Implementation of Policy **WR-2i** would be an important step in evaluating the condition of groundwater resources in order to develop better groundwater management practices in the county.

Policy **WR-2j** would assist in the development of a comprehensive groundwater assessment for each major groundwater basin in the county. While Policy **WR-2i** would focuses on specific study areas that may not coincide with groundwater basin boundaries, Policy **WR-2j** would aim towards basin-wide assessments for all major basins in the county. The assessments would be performed, as resources permit, through coordination with the incorporated cities, the SCWA, the DWR, the USGS, groundwater industry representatives, and other stakeholders in groundwater resources. The contents and process of each groundwater assessment would meet the requirements of the California Water Code for a "groundwater management plan" and may include, but are not limited to: computer modeling; water quality contaminant assessments; analysis of resource limitations and relationships to other users for wells serving public supply systems and other large users; opportunities for changing the sources of water used for various activities to better match available resources; possible funding sources for further research and management options; and provisions for applicant fees and other funding of County costs. Given that groundwater recharge would be largely dictated by rainfall and subsequent runoff, Policy **WR-2k** would encourage and support comprehensive studies of long-term regional changes in climate and precipitation patterns in the county.

Implementation of Policy **WR-2l** would increase the institutional capacity and expertise within the County to competently review hydrogeologic reports and data for critical indicators and criteria. This policy could involve hiring additional staff members to handle hydrogeologic issues within the County and / or create training programs for County officials to better educate them on hydrogeologic issues.

The policies and corresponding implementation programs found in the *Draft GP 2020* would require additional funding for such projects to take place. Policy **WR-2m** would require the County to work with the SWRCB, the DWR, the DHS, the Cal EPA, and applicable County and City agencies to seek and secure funding sources for development of groundwater assessments, protection, enhancement, and management programs.

Policy **PS-21** would consider regulations that would require the use of low impact development (LID) techniques oriented toward reduction of stormwater runoff. Secondary effects from such techniques would likely increase or protect groundwater recharge, thereby reducing the potential for groundwater decline.

Policies and programs contained in the *Draft GP 2020* include provisions for assessing current groundwater conditions, the development of sustainable yield information and basin-wide monitoring programs, revisions to the well permitting process for improved data collection and monitoring, and provisions to encourage increased groundwater recharge. The *Draft GP 2020* policies propose coordination between major water interests and water purveyors to prioritize groundwater basins for completion of the groundwater assessments and, at some time in the future, to develop a timeline for completion of the assessments, and where appropriate, to develop groundwater management plans. However, considering the uncertainty of the groundwater supply to sustainably meet the increased demand from land uses and development consistent with the *Draft GP 2020*, the policies and programs would take time to complete before establishing specific plans and appropriate management actions necessary to address groundwater problems that may arise.

Existing residences and near-term future land uses and development could be dependent on potentially declining groundwater resources. Once these resources have been adversely affected (i.e., groundwater levels lowered) recovery would be difficult.

In addition, as mentioned above, Policy **WR-2f** would require that discretionary projects maintain or increase the site's pre-development absorption of runoff. However, non-discretionary projects, such as the rural residential development consistent with **Exhibit 4.1-4**, would not be required to compensate for potential decreases in groundwater recharge, including loss of recharge opportunities in important groundwater recharge areas.

Furthermore, the *Draft GP 2020* would not directly address the long-term groundwater sustainability of non-discretionary projects in Class I and Class II areas that would rely on individual wells for water supplies. Projects that would be located in Class I and Class II areas would not be required to prepare project-specific hydrogeology reports nor provide proof of adequacy of water supply and long term sustainability unless the project would require discretionary review and approval. Projects involving high capacity agricultural wells would be of special concern in these areas.

Groundwater studies would only be required in such areas once the area has been formally identified by the Board of Supervisors as a groundwater problem area. On one hand, it would be difficult to recover groundwater resources in any given area once the problem has been identified and after new development has occurred that would add to the permanent groundwater usage demand. On the other hand, regulation of groundwater usage without well established evidence that justifies such regulation could be legally difficult in light of water related property rights.

Until county-wide groundwater assessments are prepared there simply is not enough current knowledge regarding groundwater availability and the sustainable yield of important aquifers. Preparation of these assessments could take several years to complete. Therefore, it cannot be determined conclusively that current and future groundwater supplies would be sufficient to serve land uses and development consistent with the *Draft GP 2020*. This would be a significant impact.

Mitigation Measure 4.5-5 Revise Policy **WR-2f** to include the following:

> **Policy WR-2f**: Require that discretionary projects, to the maximum extent practicable, maintain or increase the site's pre-development absorption of runoff to recharge groundwater. Implementation would include standards which could regulate impervious surfaces; vary by project type, land use, soils and area characteristics; and provide for water impoundments, protecting and planting vegetation, cisterns, and other measures to increase runoff retention and groundwater recharge. Develop voluntary guidelines for rural development that would accomplish the same purposes.

Significance After Mitigation Adoption of revised policy as outlined in Mitigation Measure 4.5-5, together with existing and proposed regulations, policies, and implementation programs, would serve to reduce potential adverse effects of future development consistent with the *Draft GP 2020* on groundwater recharge. However, they would not do so to a less-than-significant level. Therefore, this would be a significant unavoidable impact. (**SU**)

Responsibility and Monitoring The Board of Supervisors would be responsible for adopting the policy proposed in Mitigation Measure 4.5-5 as part of the *GP 2020*. The PRMD would be responsible for adopting and implementing Policy **WR-2f** as outlined in Mitigation Measure 4.5-5.

Impact 4.5-6 Saltwater Intrusion

*Land uses and development consistent with the Draft GP 2020 would increase demand on groundwater supplies in areas susceptible to saltwater intrusion. Increased groundwater pumping in certain areas of the lower Petaluma River, Sonoma Creek, and Bodega Bay could result in saltwater intrusion. This would be a less-than-significant impact. (**LTS**)*

Saltwater intrusion represents a potential threat to groundwater quality and is one of the current management issues facing groundwater resources in low-lying areas of the lower Petaluma River and Sonoma Creek basins near San Pablo Bay. The Bodega Bay community also has a salt water intrusion problem, and the Bodega Bay PUD is continuously battling saltwater intrusion in its wells that serve this unincorporated urban area. Saltwater intrusion occurs in areas where groundwater wells pump from aquifers that are hydraulically connected to saltwater (i.e., SF Bay and Pacific Ocean), inducing gradients that may cause the migration of saltwater towards the wells and potentially contaminate groundwater supplies.

Most of the south county areas that would be susceptible to saltwater intrusion are located in Class I groundwater areas. Because these low-lying areas are suitable for grape cultivation, vineyards have been increasingly planted in these areas over the last several years. These vineyards commonly depend on groundwater supplies for a portion of their irrigation needs. Currently, agricultural well permits, like other well permits, are non-discretionary and do not require the submittal of hydrogeologic studies or pump tests to the County as part of the well permit review approval, regardless of the groundwater availability classification of the area. There are also no existing regulations restricting the volume of water that such wells can pump, even if adjacent to domestic wells or in areas where saltwater intrusion is a management issue.

The development of new and expanded vineyards are discussed in *Impact 4.5-3 Water Quality - Agricultural and Resource Uses* and in ***Section 4.8 Agricultural and Timber Resources.*** In addition to continued vineyard planting in these areas, land uses and development consistent with the *Draft GP 2020* would permit other agriculturally-related activities in these areas (e.g., dairies, wineries, etc), which may also utilize groundwater for their water supplies. Most of these facilities would require the issuance of some form of discretionary permit, such as a use permit, by the County, and therefore this issue would be subject to review during environmental review. However, specific analyses and testing requirements to address saltwater intrusion have not been developed as part of the well permit review process. Furthermore, there are no restrictions on water usage quantities in Class I and Class II areas.

The Land Use and Housing Elements of the *Draft GP 2020* would also allow low density rural residential development in these areas. Larger development projects would be subject to issuance of discretionary permits, and thus CEQA review, which would provide a means for addressing the potential for saltwater intrusion and the application of appropriate use restrictions. However, smaller projects in conformance with the Land Use Plan and Zoning Code would likely not require discretionary review and approval. Since most areas subject to saltwater intrusion are located in

Class I groundwater areas, such projects would not be subject to the hydrogeologic review required of projects located in Class III and Class IV areas.

Saltwater intrusion is addressed directly and indirectly (i.e., inherent in overall groundwater quality) throughout Sections 3.1 and 3.2 of the *Draft GP 2020* Water Resources Element. Policy **WR-2g** would support the establishment of a groundwater monitoring system throughout the county. The monitoring system would help to identify areas experiencing saltwater intrusion. In areas where monitoring or studies find that saltwater intrusion has occurred, implementation of Policy **WR-1s** would encourage analysis of the potential relationship between saltwater intrusion and groundwater extraction. The provisions of this policy could later be incorporated into groundwater management actions to avoid further intrusion. Policy **WR-1t** would be limited to the marshlands and agricultural areas south of Sonoma and Petaluma, where saltwater intrusion is already a problem. It would require environmental assessments and discretionary approvals to analyze and avoid any increase in saltwater intrusion into groundwater from additional extractions.

Policy **WR-2i** would assist in the identification of groundwater management problem areas, in terms of both water quantity and quality. The identification of such problems would be incorporated into the groundwater management plans that would be developed by Policy **WR-2j**. The problem with relying on this approach would be that the County would react to saltwater intrusion problems after the problems had developed or increased in severity. It can take several years from initial problem identification to development of appropriate groundwater management actions. Once saltwater intrusion problems develop, correcting, reversing, and remedying the situation can be extremely difficult and costly.

Non-discretionary land use and development entitlements could result in seawater intrusion associated with agricultural well development, low density development, and urban development. However, the relatively low density allowed in these rural areas, coupled with the fact that the Bodega Bay Public Utility District was able to develop wells in areas not affected by saltwater intrusion, would reduce this impact to a less-than-significant level.

Mitigation Measure 4.5-6 None Required.

Impact 4.5-7 Well Competition and Adverse Well Interference

Land uses and development consistent with the Draft GP 2020 could result in an increase in the number of private wells in unincorporated areas of the county. Approval of wells in Class I or Class II areas could result in well interference impacts. This would be a significant impact. ***(S)***

Groundwater wells in close proximity or adjacent to each other can be thought of as competing for the same groundwater resource, especially in areas where the availability of groundwater is limited, and / or in areas of poorly-producing aquifer materials. When a well is pumped, a portion of the aquifer around it is dewatered or lowered, creating what is known as a cone of depression. Adjacent wells with overlapping cones of depression may have problems getting water if water levels are lower than the well pumps. Where such competition is significant it may affect the performance and delivery of water to the adjacent well(s). This condition is referred to as well interference. Most well interference problems are localized and short in duration, but being without water is a major inconvenience and can cause damage to well pumps. In some instances, individual land owners are forced to deepen their wells or lower the pump to accommodate the localized lowering of groundwater levels due to well interference.

Potential adverse well interference effects can often be anticipated by a review of adjacent well logs and local hydrogeologic data. Where such interference is thought to be a potential concern, pump tests

can be conducted on tests wells located in the vicinity of the proposed well, in which water levels in the pumping well and near-by wells are monitored and mathematically analyzed using well hydraulic principles to verify and determine the probable extent and significance of the effect, and develop appropriate mitigation and management strategies.

The current Sonoma County groundwater well ordinance requires the completion of hydrogeologic studies only in water scarce areas (i.e., Class III and Class IV groundwater areas). Similar studies of potential well interference impacts may also be required associated with discretionary development projects. Generally, in Class I and Class II areas, the development of individual parcels, including small businesses, residences, and agriculture, if consistent with the General Plan and Zoning Code, do not require discretionary approval and would not be required to conduct pump tests or hydrogeologic studies. Policy **WR-2c** of the *Draft GP 2020* calls for the revision of the current well ordinance to require that all new wells, both discretionary and non-discretionary, be located at defined distances from property lines and existing wells. The revised well ordinance provisions would apply to all groundwater areas, including Class I and Class II areas. Setbacks would vary by well size, location of nearby wells, water use, groundwater availability, lot size and other appropriate factors. However, pump tests to verify that there will not be adverse well interference effects may not be required in all cases, including large capacity wells in Class I and Class II zones.

The well setback requirements contained in Policy **WR-2c** of the *Draft GP 2020* could eventually reduce the impacts associated with well interference. Establishing standardized criteria which will adequately address these impacts will be difficult to achieve due to the very diverse groundwater conditions in Sonoma County. If setbacks and testing standards are overly complex and costly, they may be difficult to accomplish for ministerial permits, particularly for agricultural production. However, until appropriate property setback requirements for new wells are developed and adopted, potential adverse well interference impacts could still occur for large capacity wells associated with nondiscretionary land uses. This would be a significant impact.

Mitigation Measure 4.5-7 Revise Policy **WR-2c** to require that pump tests be conducted for all new high capacity wells where there is reason to believe that there may be potential adverse effects on existing adjacent wells. Revise the end of Policy **WR-2c** to include the following:

Policy WR-2c: Revise ordinance requirements for permits to drill, replace, deepen or repair all wells as follows:

(Policy items 1-6 remain the same.)

(7) Require pump tests for new high capacity wells to avoid well interference.

Significance After Mitigation Adoption of revised Policy **WR-2c** as outlined in Mitigation Measure 4.5-7, together with existing regulations, policies, and implementation programs, would further reduce potential well interference impacts. However, due to the uncertainty of groundwater resources in many areas of the county and the time that it will take to adopt an ordinance, this would remain a significant unavoidable impact. **(SU)**

Responsibility and Monitoring The Board of Supervisors would be responsible for adopting the revised policy as part of the *GP 2020*. The PRMD would be responsible for implementing revisions to Policy **WR-2c**, including developing criteria to define high capacity wells and guidelines and requirements for completion of pump tests.

DRAINAGE

Impact 4.5-8 Changes to Drainage Patterns Leading to Streambank Erosion

*Land Use and development consistent with the Draft GP 2020 would result in alterations to existing drainage patterns. Such changes would increase erosion, both in overland flow paths and in drainage swales and creeks. This would be a significant impact. (**S**)*

Alterations to drainage patterns and grading during construction activities have the potential to result in construction-related erosion problems. See *Impact 4.5-2 Water Quality – Soil Erosion and Sedimentation Related to Construction* for a discussion of construction-related erosion.

Land uses and development consistent with the *Draft GP 2020* would result in a gradual increase in impervious cover, especially in urban service areas. Typically, increases in impervious cover result in an increase in stormwater runoff, higher peak stream discharges, and decreased groundwater recharge. Agricultural land uses practices commonly alter the infiltration properties of surface soils and can have similar effects on the hydrologic cycle. Increased peak discharges resulting from changes in land use have the potential to degrade water quality by creating erosive velocities and shear stress and ultimately cause erosion and sedimentation in drainage swales and streams. Minor increases in tributary flows can also exacerbate creek bank erosion and / or cause destabilizing channel incision. The magnitude of these effects depends on total impervious surfaces in the project watershed, the nature of the storm drain system, and the extent that the drainage system incorporates peak flow reduction methodologies (e.g., porous pavement, on-site stormwater detention, in-pipe detention).

Sonoma County has not adopted a policy of "no net increase in runoff" for new development on a county-wide basis. However, with the exception of the Santa Rosa Plain and the Petaluma and Sonoma Valleys, the watersheds in the county are not extensively urbanized or developed.

Currently, hydrologic and hydraulic analysis and design procedures, criteria, and standards for drainage and flood control projects in the county are summarized in the Sonoma County Water Agency Flood Control Design Criteria Manual. The manual was last revised in 1983. However, while the manual includes design criteria primarily for flood water conveyance capacity, it also includes general provisions for streambank erosion control which allow the County to require the latest BMPs.

In addition to current NDPES and SUSMP requirements discussed in the environmental setting and under *Water Quality – Soil Erosion and Sedimentation Related to Construction*, the Public Safety and Water Resource Elements of the *Draft GP 2020* contain several stormwater management policies which would help mitigate the potential drainage and erosion impacts associated with new development. In general, the policies would encourage better land use planning through the use of appropriate hydrologic and hydraulic analysis in the discretionary project approval process with respect to site design, building location and drainage infrastructure design.

Soil erosion is also discussed in ***Section 4.7 Geology / Soils***. **Public Safety Program 2: Drainage, Erosion, and Fire Safety Standards for Subdivisions** would require amendments to Chapter 25 of the Sonoma County Code to clarify standards for drainage, erosion control and fire safety. It is assumed that the amendments to the County Code would incorporate new erosion control standards and BMPs. Policies **WR-1b** and **WR-1g** would work to minimize sediment and other pollutants in stormwater runoff from County and private buildings and facilities through implementation of design criteria and water quality BMPs for ongoing maintenance and operation.

Public Safety Policy **PS-2c** would encourage cooperation between the County and the City of Petaluma in order to implement the Petaluma River Floodplain Management Plan, the Petaluma River

Access and Enhancement Plan, and City's (pending) Surface Water Master Plan. These plans would improve storm water management through natural creeks, modified channels, and storm drains which flow to the Petaluma River. Such plans would assist in meeting federal regulations, upgrading and improving drainage infrastructure, and protecting the Petaluma River. The benefits of these plans would not be limited to areas within the Petaluma City limits. Coordination with the City of Petaluma would work to maximize the benefits of the plans to include unincorporated areas within the Petaluma River watershed.

Policy **PS-2j** would regulate development, water diversion, vegetation removal, grading and fills to minimize any increase in flooding and related damage to people and property. This policy would apply to many types of projects (besides building development) which can occur within stream corridors and could potentially adversely affect stream biological resources, water quality, and channel stability.

Policy **PS-2l** would encourage the County to develop regulations that require the use of Low Impact Development (LID) technologies. LID is a stormwater management approach that strives to manage rainfall runoff at the source using planning and site design techniques that include infiltration, filtration, storm water storage, evaporation, and detention. While traditional stormwater management systems are designed to function well under a single design condition (e.g., 10 year storm), LID uses the stormwater from more frequent events as a resource in efforts to restore the developed area's natural rainfall-runoff and groundwater recharge relationships.

Policy **OSRC-8b** and **OSRC-8c** would also provide additional policy mitigation to protect stream corridors. In addition these policies would help protect stream water quality and stream stability by establishing streamside buffers and by limiting certain kinds of activities along streams that may be harmful to the functions and values of the streams.

In summary, current practices utilized in the review of flood control, drainage, grading permits, and stormwater runoff controls under the Phase I and II NPDES programs, as well as policies contained in the *Draft GP 2020*, would help to mitigate potential impacts associated with increased runoff and other surface drainage modifications, including potential impacts to channel stability, and stream bank erosion due to changes in drainage patterns. However, specific channel stability analysis techniques and channel and streambank erosion control design criteria are not currently included in the County Code or in the Flood Control Design Criteria Manual.

Updating this design manual and the County Code to more specifically address these factors would reduce these impacts for new urban development and for larger projects in rural areas to a less-than-significant level. In addition, development of a new grading, erosion control, sedimentation, and drainage ordinance, currently in process, would reduce these impacts for some agricultural cultivation and other rural uses. However, land use activities in rural areas that are not subject to these requirements may result in drainage alterations that could lead to erosion. Therefore, this would be a significant impact.

Mitigation Measure 4.5-8 Add a new policy to Section 3.1 of the Water Resource Element addressing the effects of changes in drainage patterns leading to increased erosion in drainage swales and streams. Add a new policy **WR-1w** as follows:

> **Policy WR-1w**: Revise the County's flood control design criteria to include a section on stream geomorphic analysis and to update information on bank protection and erosion control to incorporate biotechnical bank stabilization methods for the purpose of preventing erosion and siltation in drainage swales and streams.

Significance After Mitigation While adoption of Policy **WR-1w** as outlined in Mitigation Measure 4.5-8, together with existing regulations, policies, and implementation programs, would reduce the potential impacts related to downstream erosion and siltation resulting from alterations in drainage patterns, such impacts would not be reduced to a less-than-significant level in all cases. Therefore, this would remain a significant unavoidable impact. (**SU**)

Responsibility and Monitoring The Board of Supervisors would be responsible for adopting the revised policy proposed in Mitigation Measure 4.5-8 as part of the *GP 2020*. The PRMD would be responsible for implementation of Policy **WR-1w** and developing the flood control design criteria.

Impact 4.5-9 Increased Flood Risk from Drainage System Alteration

Land uses and development consistent with the Draft GP 2020 would result in increases in stormwater runoff and peak discharge. Existing storm drain systems, including urban creeks and rivers, may be incapable of accommodating increased flows, potentially resulting in on- or off-site flooding. However, policies and programs contained in the Draft GP 2020 would reduce such impacts to a less-than-significant level. ***(LTS)***

Land uses and development consistent with the *Draft GP 2020* could increase runoff and modifications to local and regional hydrology. While the majority of future development would be concentrated in the cities, future development in presently undeveloped areas of the county may necessitate the construction of new drainage facilities for stormwater conveyance and management. In areas where drainage infrastructure already exists, drainage systems may need to be enlarged or expanded to accommodate future growth. Stormwater management practices commonly used to mitigate increases in peak flows (e.g., detention, retention, infiltration) may also be implemented throughout the county, as deemed appropriate under policies in the *Draft GP 2020*.

Local storm drainage modifications, stream channel alterations, and structural bank stabilization measures could create significant flooding impacts, in some cases by moving the existing flooding and channel instability problems cross channel or downstream, or by changing the timing of peak flows and point of discharge of runoff.

The SCWA Flood Control Design Criteria manual is generally used as the technical reference for procedures and design criteria for completing the hydrologic / hydraulic and drainage studies and in developing drainage improvement recommendations. PRMD's drainage review practices also address drainage and flooding issues as part of both discretionary and ministerial projects

Several policies and implementation programs contained in the *Draft GP 2020* would address potential drainage and flooding issues associated with future development and land uses. Implementation of **Public Safety Program 2: Drainage, Erosion, and Fire Safety Standards for Subdivisions** would include amendments to Chapter 25 of the Sonoma County Code to clarify drainage standards.

Policy **PS-2a** would make information related to surface drainage, flooding and flood hazards available to the appropriate County departments (e.g., Public Works and PRMD). Historical flood data and flood hazard delineation maps facilitate the identification of known flood hazards, their geographic extent, and frequency of flood occurrence. This information would be utilized during the planning and development review process, particularly for development sites located in or adjacent to a flood plain, but also for sites located upstream or downstream of known flood hazard areas. This would ensure any development would not exacerbate existing flooding problems. This policy is part of the **Public Safety Program 1: Safety Hazards Information System** proposed under the *Draft GP 2020* and would be a useful resource during the development of project drainage plans.

Policy **PS-2b** would allow for continued coordination among the US ACOE, the FEMA, the SCWA, and other responsible State and local agencies associated with flood hazard analysis and surface water management. Coordination among responsible agencies would facilitate better identification of appropriate drainage and flood management requirements for new development and necessary flood control improvement projects. This policy would also be part of the **Safety Hazards Information System** proposed under the *Draft GP 2020*.

Policy **PS-2c** would encourage cooperation between the County and the City of Petaluma in the implementation of the Petaluma River Floodplain Management Plan, the Petaluma River Access and Enhancement Plan, and City's (pending) Surface Water Master Plan. These plans would improve stormwater management through natural creeks, modified channels, and storm drains which flow to the Petaluma River. Such plans would assist in meeting federal regulations, upgrading and improving drainage infrastructure, and protecting the Petaluma River. The benefits of these plans would not be limited to areas within the Petaluma City limits. Coordination with the City of Petaluma would work to maximize the benefits of the plans to include unincorporated areas within the Petaluma River watershed.

Policy **PS-2d** would require the County to further develop and continue to implement a program for the "Reduction of Russian River Flood Damage". This policy would have several components including: flood data collection by geographic location; acquisition of properties in flood prone areas; an ongoing building elevation program; a flood mitigation plan to allow County participation in FEMA assistance programs and grant funds; the use of redevelopment funds to supplement FEMA grant funds in reducing repetitive flood losses; and consideration of permit fee reduction for elevation of structures in flood hazard areas and outreach to inform property owners in flood hazard areas about various options for coverage under the NFIP.

Policy **PS-2e** would expand the County's Zero Net Fill Ordinance that is currently only applicable to the Laguna de Santa Rosa to encompass all of the unincorporated areas subject to flooding. The no net fill policy refers to any material brought on to a project site within a flood plain area that would displace floodwaters and result in flooding elsewhere. The policy would require that all fill be offset by the removal of a like amount of material in order to result in a reasonable equivalence of hydrology and hydraulics between pre- and post-development. For purposes of compliance, one or more individual parcels or an entire reach may demonstrate a zero net fill balance. Implementation of this policy would help prevent new development from causing or exacerbating flood problems on adjacent properties.

Policy **PS-2f** would continue the current policy of enabling decision-making associated with land use planning and development through the review of FEMA maps or parcel-specific scaled interpretations of these maps and site-specific elevation data. This review would help determine appropriate stormwater and flood control requirements based on specific site conditions.

Policy **PS-2g** would require that the County prepare a comprehensive analysis of the potential flood hazards and drainage impacts and associated needs for adopted land use plans for each major watershed located in the county. This would facilitate identification and mitigation of direct and cumulative flood impacts resulting from the loss of permeable surfaces. New development would be required to contribute to the drainage and flood control studies. New development and redevelopment would also be required to fund mitigations for the control of downstream flooding impacts caused by upstream development. Pending completion of these drainage studies, individual project applications would be required to analyze and mitigate drainage impacts, based upon land use plans. In the event that the PRMD determines the project could have a cumulative significant impact on downstream flooding, the project applicant would be required to either prepare a supplemental EIR on such an

effect, modify the project to include drainage improvements, or participate in a funding mechanism for construction of appropriate downstream flood control improvements. Policy **PS-2g** would represent a significant change in County storm water management and flood control policy. Implementation of the policy would apply more rigorous drainage requirements to new development projects. It would also play a role in addressing the drainage impacts resulting from development in the cities, where the bulk of urban runoff occurs but is outside the County's jurisdiction.

Policy **PS-2h** would continue to set the 100-year flood event and corresponding flood elevations as the threshold by which the County would measure acceptable risk and protection in the consideration of any amendments of the land use map.

Policy **PS-2i** would require review of potential on-site and off-site flood related hazards for all substantial development and redevelopment projects requiring discretionary approval located within areas subject to known flood hazards. This would include identification of flooding impacts to the proposed project as well as flooding-related impacts to surrounding areas that could result from project development.

Policy **PS-2j** would regulate development, water diversion, vegetation removal, grading and fills to minimize any increase in flooding and related damage to people and property. This policy would apply to many types of non-development projects that occur within stream corridors.

Policy **PS-2k** would limit the placement of fill in floodplains and other areas that could retain or detain a significant amount of runoff and floodwater. This policy does not necessarily refer only to areas within existing flood hazard zones or floodplains, but could be applied to natural detention areas as well as areas adjacent to a floodplain where it may be suitable to construct a detention facility.

Policy **PS-2l** would encourage the County to develop regulations that require the use of Low Impact Development (LID) technologies. LID is a stormwater management approach that strives to manage rainfall runoff at the source using planning and site design techniques that include infiltration, filtration, storm water storage, evaporation, and detention. While traditional stormwater management systems are designed to function well under a single design condition (e.g., 10 year storm), LID uses the stormwater from more frequent events as a resource in efforts to restore the built area's natural rainfall-runoff and groundwater recharge relationships.

Implementation of Policy **PS-2m** would require that the payment of costs for drainage facilities to handle surface runoff from new development be the responsibility of developers and others who benefit from the facilities. Policy **PS-2m** would require that new development, and those who benefit from construction of the drainage facilities, fund (or participate in a funding mechanisms) for new drainage infrastructure improvements.

Policy **PS-2n** would require that the design and construction of drainage facilities be subject to the review and approval of the PRMD. The PRMD would ensure the proposed drainage facilities comply with all applicable drainage and flood control standards prior to project approval.

Policy **PS-2o** would require that tentative and final subdivision maps and approved site plans show areas subject to flooding as shown on FEMA maps. This policy would involve overlaying digital FEMA flood hazard maps on top of tentative maps to facilitate project planning and design review.

Policy **PS-2p** would emphasize floodplain management over flood control structures for preventing damage from flooding except where the intensity of development requires a high level of protection and justifies the cost of structural measures. Examples of floodplain management measures include

the no net fill ordinance, restricting the placement of structures in regulatory floodways, and raising building elevations above the 100-year floodplain.

Policy **PS-2q** would consider the potential risk of damage from flooding in the design and review of projects, including those which could facilitate floodplain development.

Under Policy **PS-2r**, the County would be required to avoid variances to building setbacks along streams and in 100-year floodplains without the review and approval of PRMD.

Implementation of Policy **PS-2s** would require that the SCWA be responsible for prioritizing and undertaking flood hazard mitigation projects on a continuous basis on selected waterways subject to the policies of the Open Space and Resource Conservation Element.

Policy **PS-2u** would encourage completion and filing of inundation maps for all dams whose failure could cause loss of life or personal injury within Sonoma County. Inundation maps would help planners in assessing the potential impacts of dam failure.

Policies in the Open Space and Resource Conservation Element would restrict development in riparian corridors along all intermittent and perennial streams thereby slowing stormwater runoff flowing into streams. In addition, policies in the Water Resources Element which provide for stormwater pollution controls for urban development and for large projects in rural areas may also reduce the rate of surface water runoff and potential downstream drainage and flooding problems.

Adoption and implementation of the policies and programs contained in the *Draft GP 2020* and discussed above would ensure that potential impacts of future development of on- and off-site flooding and drainage infrastructure would be reduced to a less-than-significant level. Although flooding would continue to occur in flood prone areas, this is considered an existing condition for purposes of CEQA review, and the policies and programs of the *Draft GP 2020* would ensure that flooding in these areas would not worsen. It should also be noted that the cities are expected to e the primary contributors to large-scale drainage alterations that could lead to flood risk, particularly the cities in the central county area.

Mitigation Measure 4.5-9 None required.

FLOODING

Impact 4.5-10 Place Housing or Structures in 100-Year Flood Hazard Areas

Land uses and development consistent with the Draft GP 2020 would allow continued development in 100-Year Flood Hazard Areas. However, policies and programs contained in the Draft GP 2020 would reduce such impacts to a less-than-significant level. ***(LTS)***

The *Draft GP 2020* Land Use and Housing Elements generally would continue to allow new development and redevelopment within unincorporated areas designated as FEMA 100-year flood hazard areas. However, the *Draft GP 2020* would provide policies to mitigate the potential consequences of such development by means of appropriate design criteria to protect both proposed structures as well as existing structures downstream.

Potential flooding impacts in Sonoma County due to development would not be limited to the unincorporated urban service areas. When severe flooding occurs, it affects flood areas throughout the

major basins. Flood zone hazards are therefore subregional in geographic scope, and could affect county residents, structures, and land use activities throughout large portions of the county.

Several FEMA-designated floodplain areas within Sonoma County have a history of repetitive flood damage. These include areas along Sonoma Creek in and near the city of Sonoma, along the Petaluma River above and within the City of Petaluma, along the Laguna de Santa Rosa in and near Sebastopol, and along the middle and lower course of the Russian River, including the communities of Guerneville and Monte Rio.

Section 7B of the current County Code requires that residential structures built within FEMA-designated 100-year flood hazard zones be elevated at least one foot above the elevation of the 100-year flood level to protect these structures from flood damage. New nonresidential buildings must either meet this criterion or provide an alternate method of flood proofing that is certified by a registered engineer and approved by the PRMD Chief Building Inspector.

The *Draft GP 2020* contains several policies and implementation programs to mitigate potential impacts arising from development in 100-year flood hazard zones. Many of these policies are discussed above under *Impact 4.5-9 Increased Flood Risk from Drainage System Alteration* and apply to general flood issues as well as issues associated with development in 100-year flood hazard areas. The policies described below are specific to development within 100-year flood hazard zones.

Revisions to the County's Zero Net Fill Ordinance as required under Policy **PS-2e** would extend the requirements of the ordinance to apply to all unincorporated areas of the county subject to flooding. This policy would require that any material placed within the 100-year floodplain that would displace floodwaters and result in flooding elsewhere be offset by the removal of a like amount of material. This policy would result in a reasonable equivalence of hydrology and hydraulics between pre- and post-development conditions. For instance, because residential structures in the floodplain must be elevated at least one foot above base flood elevations, the amount of fill placed to elevate the structure must be balanced by soil removal in an adjacent portion of the floodplain to prevent the downstream displacement of floodwaters.

Policy **PS-2g** would require that the County prepare a comprehensive analysis of potential flood hazards and drainage impacts and associated needs for adopted land use plans for each major watershed located in the county. This would include the comparison of FEMA flood hazard zones with designated land uses and facilitate identification and mitigation of potential flood impacts.

Policy **PS-2h** would continue to set the 100-year flood event and corresponding flood elevations as the threshold by which the *GP 2020* would measure acceptable risk and protection in the consideration of any amendments to the Land Use map.

Policy **PS-2o** would require that tentative and final subdivision maps and approved site plans show areas subject to flooding as shown on FEMA maps. This would allow County planners to better evaluate the potential for flood impacts as a result of project approval. For all projects located within areas subject to known flood hazards, Policy **PS-2i** would require a technical review of on-site and off-site flood related hazards. Under Policy **PS-2h**, the 100-year flood event and corresponding flood elevations would be the threshold by which the County would measure acceptable risk and protection in the consideration amendments to the land use map. As required under Policy **PS-2r**, the County would be required to avoid issuing variances to building setback requirements along streams and in 100 year floodplains without detailed hydrologic/hydraulic review and approval of PRMD.

Development consistent with the *Draft GP 2020* within designated 100-year flood hazard zones in unincorporated areas would be subject to development standards aimed at minimizing onsite and offsite flood damage. Implementation of the above policies and their corresponding implementation programs would reduce potential impacts associated with development in the 100-year flood hazard area to a less-than-significant level.

Mitigation Measure 4.5-10 None required.

Impact 4.5-11 Impede or Redirect Flows in Flood Hazard Areas

The placement of land uses and development, particularly structures within 100-year flood hazard areas could impede or redirect flood flows, resulting in secondary flood damage including bank instability and erosion. This would be a significant impact. ***(S)***

The *Draft GP 2020* Land Use and Housing Elements would continue to allow new development and redevelopment within unincorporated areas designated as FEMA 100-year flood hazard areas. Policies and programs included in the *Draft GP 2020* would seek to mitigate the potential consequences of such development on both proposed structures as well as existing structures located downstream. The *Draft GP 2020* would focus on the assessment and prevention of the 100-year flood damage, especially from building in flood hazard zones and in areas of repetitive flooding. This issue is particularly important along the lower Russian River where communities such as Guerneville were established many years ago in flood hazard areas. Neither removal of these communities entirely outside of flood zones nor avoidance of all construction on these urban lots is feasible.

Drainage and flood hazard reduction policies were discussed under *Impact 4.5-9 Increased Flood Risk from Drainage System Alterations*. Especially relevant to the discussion of flow impedance and redirection is Policy **PS-2e**. Implementation of this "No Net Fill" policy, along with standard FEMA policies and current County zoning regulations in flood zones, would prevent most occurrences of flood flow impedance and flow redirection.

However, flood damage can also be defined more broadly to include bank failure and streambed and bank erosion during high flow events. Therefore, the geomorphic consequences of building in 100-year flood hazard areas associated with the obstruction or redirection of flood flows and increased downstream channel instability from increased flows and increased flood flow velocities also need to be considered.

The development of currently vacant land areas within floodplains, especially in rural areas that have not previously had drainage improvements made, typically involves the modification of minor surface waterways and tributary stream courses. Where development occurs within the floodplain of a larger stream course, most often some form of channel modification is required, either locally to accommodate new storm drainage outfalls, or as is sometimes the case, local stream re-alignment and structural bank stabilization. The practice of lining channel banks with rock riprap and other hard structures can cause cross bank and downstream channel instability problems. In some cases where the toe or face of the structures encroach into the stream channel, this can also redirect flow, constrict channels (causing backwater flooding effects), or increase local turbulence and flow velocities (causing bank erosion).

Local storm drainage modifications, stream channel alterations, and structural bank stabilization measures can create significant flooding impacts. In some cases these include redirecting or moving existing flooding and channel instability problems cross channel or downstream, or by changing the timing of peak flows and the point of discharge of runoff.

The *Draft GP 2020* contains several policies that would reduce the potential for the placement of inappropriate land uses and development in flood hazard areas. These policies are listed in the discussion of *Impact 4.5-9 Increased Flood Risk from Drainage System Alterations.*

In addition to these policies, the current standards of the County Zoning Code prohibit the placement of permanent structures in the floodways with some exception for properly designed and placed bank stabilization projects. Structures placed in the floodplain are allowed, but only outside the floodway such that they would not be expected to substantially impede or redirect flood flows substantially.

However, these regulations and policies would not avoid alteration of the channel environment nor would they avoid new construction in flood hazard areas such as the lower Russian River. Therefore, this would be a significant impact**.**

Mitigation Measure Same as Mitigation Measure 4.5-8.

Significance After Mitigation Revision of Policy **WR-1w** as identified in Mitigation Measure 4.5-8, together with existing regulations, policies, and implementation programs, would reduce the impacts associated with flow impedance and redirection of flood flows. However, this would remain a significant unavoidable impact. **(SU)**

Responsibility and Monitoring The Board of Supervisors would be responsible for adopting the revised policy proposed in Mitigation Measure 4.5-8 as part of the *GP 2020*. The PRMD would be responsible for implementation of Policy **WR-1w** and developing flood control design criteria.

Impact 4.5-12 Failure of Levee or Dam

Potential failure of levees or dams could expose people and structures to inundation and result in loss of property, increased risk, injury or death. This would be a significant impact. ***(S)***

The County has 44 regulated dams within its boundaries. Larger dams whose potential failure could cause severe inundation include the Warm Springs Dam built by the Army Corps of Engineers in 1983 at the confluence of Warm Springs Creek and Dry Creek, and the Coyote Dam built in 1958 on the East Fork Russian River in Mendocino County. Although the County has not experienced dam failure in the last 20 years, the sudden failure of any one of these facilities, for instance, in response to a large magnitude earthquake, could potentially cause flooding in communities downstream of the dams. [10]

Specific requirements with respect to most non-federal dam designs and operations are established by the California Division of Safety of Dams, which are administered by the County. The US Army Corps of Engineers is responsible for the operation of the Warm Springs facility, including completing requisite safety inspections. The California Government Code requires periodic safety inspections of dams, completion of studies that predict the flood zones created by sudden dam failure, and the development of emergency response plans in the advent of pending dam failure, including a program for emergency warning and evacuation prepared by the Emergency Management division of the Sonoma County Department of Emergency Services. The contingency plans are updated every two years and submitted to the State Office of Emergency Services for review and comment. Incorporated cities are responsible for developing contingency plans for State-designated dams affecting

10 Sonoma County Department of Emergency Services, 2004.

incorporated areas. Sonoma County has the responsibility for developing emergency plans for State-designated dams affecting unincorporated areas.

Unlike some areas of California, Sonoma County does not have an extensive system of levees that provide urban flood protection that are susceptible to catastrophic levee failure. Levees and floodwalls that are constructed as part of U.S. Army Corps of Engineers or Department of Agriculture flood control projects, or by local city or Flood Control District programs administered jointly by the County Water Agency also are required to undergo periodic inspections for safety and performance as part of routine maintenance plans. Such plans are completed as elements of project design and operational planning. However, it is recognized that the levees along the Russian River below Coyote Dam are the responsibility of the Corps of Engineers. Levee and floodwall assessment is also typically completed as part of a FEMA Flood Insurance Rate study, including floodplain mapping updates.

The most extensive series of levees in Sonoma County that are potentially susceptible to failure are the predominantly non-engineered farm levees that protect low lying farmland and rural housing along the lower reaches of the Petaluma River and Sonoma Creek. Although some of these may be maintained by small reclamation districts, most of the non-engineered farm levees in these areas are maintained by the individual farmers and ranchers. Technical support and assistance are sometimes provided by the Department of Agriculture and local Resource Conservation Districts. Levees in these areas probably represent the greatest risk of levee failure, and several farm levees along the lower Petaluma River and Sonoma Creek failed during flood events as recently as 1998. Although several low lying farmhouses and some farm buildings and equestrian facilities were flooded, and there was some loss of agricultural crops, widespread damage did not occur.

New dams and levees, however, would be subject to review and approval of the State Division of Dam Safety, the State Division of Water Rights, and County grading permit requirements that would reduce the future likelihood of dam failure. Where a flood control district had jurisdiction, dams and levees would be reviewed and approved by the district.

Policy **PS-2u** of the *Draft GP 2020* would encourage timely completion and filing of inundation maps for all dams whose failure could cause loss of life or personal injury within Sonoma County. Such maps would assist planners in determining potential inundation hazards for existing and future development.

The failure and inundation potential of all dams and levees within unincorporated portions of the county is not presently known. Implementation of Policy **PS-2u** would identify dam and levee failure inundation areas and allow for potential improvements in emergency planning. However, the *Draft GP 2020* does not include provisions to investigate the stability of existing non-engineered farm levees and small farm dams that may require rehabilitation to protect adjacent or downstream development from inundation. This would be a significant impact.

Mitigation Measure 4.5-12 Revise Policy **PS-2u** to include a provision for review and rehabilitation of dams and levees that pose a significant threat of inundation to adjacent or downstream development. Revise the end of Policy **PS-2u** to include the following text:

> Policy **PS-2u**: Encourage the timely completion and filing of inundation maps for all dams whose failure could cause loss of life or personal injury within Sonoma County. <u>Where inundation maps indicate dam or levee failure could cause loss of life or property or personal injury, coordinate with the corresponding responsible party to investigate levee or dam stability and management and identify rehabilitation and maintenance needs as appropriate</u>.

Significance After Mitigation Adoption of the revised Policy **PS-2u** as outlined in Mitigation Measures 4.5-12, together with other existing flood prevention strategies and policies, would reduce potential inundation hazards to existing and future development to a less-than-significant level. (**LTS**)

Responsibility and Monitoring The Board of Supervisors would be responsible for adopting the revised policy proposed in Mitigation Measure 4.5-12 as part of the *GP 2020*. The PRMD would be responsible for implementation of Policy **PS-2u**.

4.6 BIOLOGICAL RESOURCES

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Biological Resources – Environmental Setting

The Biological Resources section provides background information on sensitive biological resources within the county, the regulations and programs which provide for their protection, and an assessment of the potential impacts of implementing the *Draft GP 2020*. The topics discussed in this section overlap with other sections of this EIR, including the Visual Resources and Agricultural and Timber Resources sections. Biological resource impacts are most closely related to *Land Use*, *Open Space and Resource Conservation, Water Resources,* and *Public Safety* elements of the *Draft GP 2020.*

INTRODUCTION

Sonoma County encompasses over one million acres of diverse landscape, ranging from the marine environments of the coastal zone, to the forests, woodlands, and grasslands of the coast range foothills and mountains, the vernal pools, seasonal wetlands, and freshwater marshes of the Santa Rosa Plain and Laguna de Santa Rosa, and the extensive marshlands along San Pablo Bay. Urban development occupies much of the valley floors through the central portion of the county along US 101 and Highways 116 and 12, with cities separated and generally surrounded by grazing lands and agricultural uses, primarily vineyards, dryland crops, and irrigated pasture.

The remaining natural communities in Sonoma County support a wide diversity of plant and animal species, including a high number of special-status species and sensitive natural communities. Natural community types in the county include mixed evergreen forests, oak woodlands and savanna, native and non-native grasslands, coastal beach dune, coastal bluff, northern coastal scrub, chaparral, coastal salt marsh, brackish marsh, freshwater marsh, and riparian scrub and woodland. **Exhibit 4.6-1** shows the distribution of vegetative cover in the county, modified from the 2000 CalVeg mapping program of the U.S. Forest Service. [1] The area along the fringe of San Pablo Bay in the lower Sonoma Valley and along the Petaluma River is based on more generalized information developed in 2002 as part of the wildlife habitat mapping for the Fire and Resource Assessment Program (FRAP) of the California Department of Forestry and Fire Protection. [2] Major distinguishable characteristics in **Exhibit 4.6-1** include: the mosaic of forest, woodland, grassland, and chaparral in the northwest and in the Mayacamas and Sonoma Mountains to the northeast and east, the extensive agricultural and urban development on the valley floors, and the grasslands across the southwestern portion of the county.

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1 Large format versions of **Exhibits 4.6-1**, **4.6-2**, and **4.6-3** are available for viewing at Sonoma County PRMD, 2550 Ventura Avenue, Santa Rosa, CA 95403.

2 *Fire and Resource Assessment Program,* California Department of Forestry and Fire Protection, 2002.

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Exhibit 4.6-1
Sonoma County Vegetative Cover

Historic land use has altered much of the landscape in the county, including the plant communities and wildlife dependent upon them. Beginning in the mid-nineteenth century and continuing into the present, activities such as livestock grazing, timber operations, clearing and disking for agricultural production, road building, and urban and suburban development have markedly altered the remaining natural communities. Native perennial grasslands have been largely replaced by non-native annual grasslands, and a number of highly invasive species now threaten the remaining grasslands. Most of the conifer forests have been logged extensively in the past, with only a few scattered stands of old growth redwood remaining in the Russian River and Gualala River watersheds. Fire suppression, livestock grazing, timber harvest, vineyard conversion, and more recently the effects of Sudden Oak Death (SOD) have greatly altered the extent of woodland and forest cover. Grazing and clearing for firewood and agricultural production have reduced the extent of oak woodland and savanna and continue to affect oak regeneration, particularly on the valley floors and lower foothills where development pressures continue today as croplands are converted to urban and suburban uses. The past effects of poorly managed timber harvesting, gravel mining, and livestock overgrazing continue to influence the aquatic habitat of the rivers and streams in the county, and limit the viability of the anadromous fisheries. Urban and suburban development, freeway and highway widening projects, vineyard expansion, and use of exclusionary fencing to protect crops have all contributed to considerable fragmentation of the remaining natural areas in the county.

Although past influences have greatly altered the natural landscape, Sonoma County contains considerable land area which remains undeveloped or is used for grazing and timber production and continues to provide important habitat for native plants and animals. These remaining undeveloped lands serve as core areas for habitat biodiversity, and maintenance of connectivity between these areas is essential for their sustainability. The scattered permanently protected open space, the remaining undeveloped, agricultural, and timber production lands, and network of riparian corridors throughout the county serve as a foundation for protecting and restoring the values and functions of the natural environment.

SPECIAL-STATUS SPECIES

The primary information source on the distribution of special-status species in California is the California Natural Diversity Database (CNDDB) inventory, which is maintained by the Wildlife and Habitat Data Analysis Branch of the California Department of Fish and Game (CDFG).[3] The CNDDB inventory provides the most comprehensive state-wide information on the location and distribution of special-status species and sensitive natural communities. Occurrence data is obtained from a variety of scientific, academic, and professional organizations, private consulting firms, and

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[3] Special-status species include:

Designated (rare, threatened, or endangered) and candidate species for listing by the CDFG.
Designated (threatened or endangered) and candidate species for listing by the USFWS.
Species considered to be rare or endangered under the conditions of Section 15380 of the California Environmental Quality Act Guidelines, such as those identified on lists 1A, 1B, and 2 in the 2001 *Inventory of Rare and Endangered Plants of California* by the California Native Plant Society (CNPS).
And possibly other species which are considered sensitive or of special concern due to limited distribution or lack of adequate information to permit listing or rejection for state or federal status, such as those included on list 3 in the CNPS Inventory or identified as animal "California Special Concern" (CSC) species by the CDFG. Species designated as CSC have no legal protective status under the California Endangered Species Act but are of concern to the CDFG because of severe decline in breeding populations and other factors.

knowledgeable individuals, and is entered into the inventory as expeditiously as possible. The occurrence of a species of concern in a particular region is an indication that an additional population may occur at another location if habitat conditions are suitable. However, the absence of an occurrence in a particular location does not necessarily mean that special-status species are absent from the area in question, only that no data has been entered into the CNDDB inventory. Detailed field surveys are generally required to provide a conclusive determination on presence or absence of sensitive resources from a particular location where there is evidence of potential occurrence.

The records of the CNDDB indicate that special-status plant and animal species occur in a wide range of habitat types throughout Sonoma County. **Exhibit 4.6-2** shows the distribution of the CNDDB occurrence records for special-status species in the county, together with stream segments known to support coho salmon, steelhead trout, and chinook salmon based on data from the CDFG. **Exhibit 4.6-3** shows the extent of major wetland, river, and stream systems. The CNDDB information has been simplified to distinguish the occurrence record as either a plant or animal, rather than identifying each species by name. **Exhibit 4.6-4** provides a list of the 42 animal species and 86 plant species reported from Sonoma County which are monitored by the CNDDB.

It should be noted that the occurrence records of the CNDDB tend to focus on listed species or those with a high inventory priority. Occurrence information for numerous special-status species which are known to occur in Sonoma County is either not monitored at all, or is recorded on only a sporadic basis by the CNDDB. This includes the possible seasonal occurrence of some bird species, the limited status of some animal species as a California Special Concern (CSC) species by the CDFG, and the limited status of many plant species on Lists 2, 3, or 4 of the California Native Plant Society Inventory (CNPS). Some of these species are identified in **Exhibit 4.6-4**, but the number of occurrences from the CNDDB records does not accurately reflect their generally greater abundance and distribution than species that are actually listed under the State or federal Endangered Species Acts (ESAs).

The U.S. Fish and Wildlife Service (USFWS) also maintains information on special-status species as part of their project review and consultation responsibilities, and will prepare lists of known or suspected species from a particular county or US Geological Survey USGS quadrangle. A request for special-status species known or suspected to occur in Sonoma County generated a list of 212 species which are listed, candidate, or Species of Concern (generally former candidate species in previous classification system of USFWS). The much greater number of species in the USFWS list compared to the CNDDB records is due in part to the inclusion of numerous candidate species, Species of Concern, and species considered to be of local or regional concern due to conservation significance. A number of marine wildlife species not in the CNNDB inventory are also included in the USFWS list. Discrepancies between the two lists provide an indication of the limitations in collecting and monitoring data on special-status species, and need for detailed assessments when proposed development could affect sensitive habitat.

For many of the special-status species known to occur in Sonoma County, habitat suitability is severely limited by the direct and indirect effects of development. These include the direct loss of habitat as a result of conversion to urban uses, effects of on-going habitat modifications due to vegetation management and agricultural practices, and indirect effects such as non-point discharge into aquatic habitat and recreational activities on open space lands. Habitat fragmentation is an important consideration in evaluating the recovery of listed species and the viability of natural communities as a whole. Identification and protection of essential habitat for special-status species must be recognized during the environmental review of proposed development applications and in planning future open space acquisitions. Detailed surveys may be needed for sites where there is a potential for occurrence of special-status plant and animal species.

Exhibit 4.6-2
Special Status Species

A number of special-status species reported from Sonoma County are wide-ranging and are the focus of management efforts by trustee agencies. Species of particular concern include: California tiger salamander, California red-legged frog, coho salmon, steelhead trout, chinook salmon, northern spotted owl, and numerous plant species associated with vernal pool habitat. The following provides a summary of relevant management issues for each of these species.

Coho Salmon, Steelhead Trout, and Chinook Salmon

Coho salmon, steelhead trout, and chinook salmon are all listed as threatened under the federal ESA, and all are anadromous, spawning in coastal streams and rivers and then migrating to and maturing in the ocean. Timber harvest activities, overgrazing, gravel mining operations, channel modifications and removal of riparian vegetation, flood control facilities, hydroelectric facilities, and secondary water quality degradation have all contributed to a decline of these species. Coho and steelhead are native species of the county, which is part of the Central California Coast Evolutionarily Significant Unit (ESU) defined as part of species listings. It is uncertain whether chinook salmon is a native species of the county, although the Russian River is part of the California Coastal ESU for the species listing. Streams and river corridors with established or historic records of these species are indicated in **Exhibit 4.6-2**. Where a record of coho or steelhead has been reported from a stream, the entire drainage has been indicated as supporting the species, although habitat conditions have sometimes not been confirmed in the field.

Sonoma County is currently participating in the FishNet 4C program, which is a county-based, regional salmonid protection and restoration program created under a Memorandum of Agreement between six central California coastal counties: Marin, Mendocino, Monterey, San Mateo, Santa Cruz, and Sonoma. FishNet 4C recognizes the need for these counties to meet the requirements of the ESA in protecting anadromous salmonids and their habitats. Given these requirements, a prime objective of the FishNet 4C program has been to evaluate the land management practices of each county and any written policies related to protecting salmonid populations, and to make recommendations for improving these practices and policies.

California Tiger Salamander

The Sonoma County population of California tiger salamander is listed as threatened by the USFWS. California tiger salamander is recognized as a protected species and a CSC by the CDFG. The USFWS has mapped the potential range of California tiger salamander. [4] California tiger salamander occurs in grassland and savanna habitat, breeding in vernal pools and swales, seasonal drainages, and man-made ponds, and spending most of the year in subterranean refugia such as rodent burrows, cracks, and under rocks and logs. Adults migrate to suitable breeding locations with the onset of sustained rainfall, and have been reported to move considerable distances. Most of the occurrences of this subspecies in Sonoma County are from the complex of vernal pools and drainages of the Santa Rosa Plain along the Laguna de Santa Rosa watershed, generally between Sebastopol, Santa Rosa, and Cotati. Extensive habitat conversion and fragmentation of breeding habitat has eliminated this species from much of its former range, and is considered a serious threat to the Sonoma County population. Recently, the USFWS has joined with other responsible agencies, the County, cities and interest groups in developing a California tiger salamander strategy aimed as resolving conflicts between species preservation and development in the urban areas of the Santa Rosa Plain.

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4 The potential range of the California tiger salamander is shown in Figure OSRC-2 of the *Draft GP 2020*.

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Exhibit 4.6-3
Wetlands and Streams

California Red-Legged Frog

This species is listed as threatened by the USFWS and is recognized as a CSC by the CDFG. It typically occurs in aquatic habitat of streams and ponds, but can disperse considerable distances in search of breeding and aestivation sites. Scattered occurrences of California red-legged frog are known from the west Petaluma and south Cotati vicinity, the Salmon Creek watershed, and the Sonoma Valley. Three areas were identified as part of the critical habitat for this species as mapped by the USFWS. In Sonoma County, the previously mapped critical habitat consisted of the areas surrounding Laguna Lake west of Petaluma, the grasslands east of Petaluma Marsh, and part of the Sonoma Mountains. This mapped critical habitat did not correspond with all known occurrences of this species in Sonoma County. Court rulings made in response to lawsuits over the designated critical habitat have rescinded the mapped critical habitat designations in Sonoma County and other northern California locations. Continued loss of upland dispersal habitat, fragmentation of remaining breeding locations, competition and predation by bullfrog, and degradation of aquatic habitat are primary concerns regarding protection and recovery of this species.

Northern Spotted Owl

The USFWS listed the northern spotted owl as a threatened species in 1990. The southern limit of their range extends across the coastal and inland forests and woodlands of Sonoma County southward into Marin County. Occurrences of this species extend along the entire coast of the county, the Mayacamas Mountains, and Sonoma Mountain. On-going studies have been conducted to monitor population health and further define essential habitat. The southern population of spotted owl is subject to several threats, including habitat loss and disturbance due to timber harvest, agricultural conversion, development at the fringe of existing forest and woodland habitat, hazardous fuel management, potentially catastrophic wildfires along the urban / wildland interface, and continued range expansion of the barred owl. Of particular concern is the continuing die-off of tanbark and coast live oaks throughout spotted owl habitat due to Sudden Oak Death, and the long-term impacts this may have on prey populations and owl nesting and foraging habitat.

Vernal Pool Plant Species

Several plant species with special-status are known to occur in the seasonal wetland habitats of the Santa Rosa Plain. Four of them, Sonoma sunshine, Burke's goldfields, Sebastopol meadowfoam, and many-flowered navarretia, are federally and state-listed as endangered. Several others are believed to have been extirpated from the Santa Rosa Plain or have no legal protective status under the ESA but are CNPS list species associated with seasonal wetlands and uplands. These include dwarf downingia, Baker's navarretia, Gairdner's yampah, hayfield tarplant, the state-listed rare North Coast semaphore grass, the state and federally-listed endangered white sedge, the federally-listed endangered Sonoma alopecurus, and the federally listed showy Indian clover.

Exhibit 4.6-4
Special-Status Plant and Animal Species Known to Occur in Sonoma County

Common Name (Scientific Name)	Federal Status [a]	State Status [b]	Habitat Characteristics	Number of CNDDB Records
ANIMALS				
Invertebrates				
Behren's silverspot butterfly *(Speyeria zerene behrensii)*	FE	None	Coastal terrace prairie with suitable violet host plant.	2
Bumblebee scarab beetle *(Lichnanthe ursina)*	FSC	None	Sand dunes and in sand dunes, observed from April to August.	2
California freshwater shrimp *(Syncaris pacifica)*	FE	SE	Riparian scrub and woodland in perennial drainages with undercut banks and overhanging vegetation.	10
California linderiella *(Linderiella occidentalis)*	None	None	Vernal pools and swales in grassland and oak savanna.	5
Callippe silverspot butterfly *(Speyeria callippe calliope)*	FE	None	Grassland and scrub with suitable violet host plant.	1
Mimic tryonia (*Tryonia imitator*)	None	None	Brackish water marsh.	1
Monarch butterfly *(Danaus plexippus)*	None	None	Coniferous forest, planted cypress/eucalyptus, generally along coast. Overwintering sites of concern.	18
Myrtles silverspot *(Speyeria zerene myrtleae)*	FE	None	Grasslands, pasture, sand dunes along coast with suitable violet host plant species.	9
Opler's longhorn moth *(Adela oplerella)*	FSC	None	Serpentine grassland.	1
Ricksecker's water scavenger beetle *(Hydrochara rickseckeri)*	FSC	None	Freshwater ponds, stockponds, and larger pools.	1
Sonoma arctic skipper *(Carterocephalus palaemon magnus)*	FSC	CSC	Redwood and evergreen forest.	1
Tomales isopod *(Caecidotea tomalensis)*	FSC	None	Freshwater pond and seasonal wetlands.	2
Fish				
Coho salmon - Central California ESU *(Oncorhynchus kisutch)*	FT	SE	Anadromous species migrates to rivers and streams with suitable substrate and temperatures for egg laying.	1
Navarro roach *(Lavinia symmetricus navarroensis)*	None	CSC	Freshwater streams.	2
Gualala roach *(Lavinia symmetricus parvipinnis)*	FSC	CSC	Freshwater streams.	3
Russian river tule perch *(Hysterocarpus traski pomo)*	FSC	CSC	Streams with overhanging riparian vegetation.	4
Sacramento splittail *(Pogonichthys macrolepidotus)*	FT	CSC	Brackish water habitat found along Petaluma River.	1
Steelhead-Central California Coast ESU *(Oncorhynchus mykiss irideus)*	FT	None	Anadromous species migrates to rivers and streams with suitable substrate and temperatures for egg laying.	2
Tidewater goby *(Eucyclogobius newberryi)*	FE	CSC	Salt and brackish water lagoons and rivers.	3

Common Name (Scientific Name)	Federal Status [a]	State Status [b]	Habitat Characteristics	Number of CNDDB Records
Amphibians/Reptiles				
California red-legged frog *(Rana aurora draytonii)*	FT	None	Typically found in riparian and freshwater marsh, but known to disperse considerable distances through grassland and other habitats.	9
California tiger salamander *(Ambystoma californiense)*	FT	CSC, P	Breeds in vernal pools, swales, drainages, and ponds, and aestivates in burrows and other moist retreats in grassland, savanna, and fields.	24
Foothill yellow-legged frog *(Rana boylii)*	FSC	CSC, P	Riparian dependent species typically in second order streams, with mature trees and bed of gravel, cobble, and boulders.	26
Western pond turtle *(Clemmys marmorata)*	FSC	CSC, P	Freshwater streams, pools, and ponds with secure haulout along banks and adjacent uplands for egg laying.	26
Birds				
Bank swallow *(Riparia riparia)*	None	ST	Nests in stream banks and cliffs with friable soils.	1
Black swift *(Cypseloides niger)*	None	CSC	Rare, local summer resident of mountain canyons. Nests on cliffs behind or adjacent to waterfalls.	1
Burrowing owl *(Athene cunicularia)*	None	CSC	Agricultural fields and grasslands, nesting in burrows, pipes and debris.	2
California black rail *(Laterallus jamaicensis coturniculus)*	None	ST, P	Salt and brackish water marsh.	4
California clapper rail *(Rallus longirostris obsoletus)*	FE	SE, P	Salt and brackish water marsh.	9
Double-crested cormorant *(Phalacrocorax auritus)*	None	CSC	Forages in open water habitats, colonial roosting/sunning in secure locations. Roosting locations of concern to CDFG.	1
Great blue heron *(Ardea herodius)*	None	None	Forages in fresh, brackish, salt marsh habitats, nests in trees. Roosting locations of concern to CDFG.	1
Saltmarsh common yellowthroat *(Geothlypis trichas sinuosa)*	FSC	None	Brackish and salt marsh dominated by bulrush.	16
Tricolored blackbird *(Agelaius tricolor)*	FSC	CSC	Colonial nester in thickets along riparian corridors.	3
Western yellow-billed cuckoo *(Coccyzus americanus occidentalis)*	None	SE	Historical occurrences along riparian woodland and scrub.	2
Western snowy plover *(Charadrius alexandrinus nivosus)*	FT	CSC	Nests along exposed beaches, forages along ocean shoreline.	2
White-tailed kite *(Elanus leucurus)*	None	P	Nests in trees and shrubs, forages in grassland, savanna, open habitats.	1
Purple martin *(Progne subis)*	None	CSC	Nests in snags in a variety of forest and woodland types.	1
Northern spotted owl *(Strix occidentalis caurina)*	FT	None	Evergreen forest and woodland with suitable prey, typically wood rat.	48
Mammals				
Pallid bat *(Antrozous pallidus)*	None	CSC	Varied foraging habitat with abandoned structures, mines, caves used for roosting where disturbance is minimal.	12
Red tree vole *(Arborimus pomo)*	None	None	Mixed evergreen woodland and forest.	27
Salt-marsh harvest mouse *(Reithrodontomys raviventris)*	FE	SE	Salt marsh and brackish marsh dominated by pickleweed.	3
Suisun shrew *(Sorex ornatus sinuous)*	None	None	Salt marsh and brackish marsh.	1
Yuma myotis *(Myotis yumanensis)*	None	None	Varied foraging habitat with abandoned structures, mines, caves used for roosting where disturbance is minimal.	1

Common Name (Scientific Name)	Federal Status [a]	State Status [b]	CNPS Status [c]	Habitat Characteristics	Number of CNDDB Records
PLANTS					
Pink sand-verbena *(Abronia umbellata ssp breviflora)*	None	None	1B	Coastal dunes.	3
Blasdale's bent grass *(Agrostis blasdalei)*	None	None	1B	Exposed coastal dunes, bluffs, and prairie.	4
Pt Reyes bent grass *(Agrostis clivicola var punta-reyesensis)*	None	None	None	Grassland in sandy loam along coast. Considered but rejected for listing by CNPS.	2
Franciscan onion *(Allium peninsulare var franciscanum)*	None	None	1B	Woodland, grassland, often on serpentine substrate.	3
Sonoma alopecurus *(Alopecurus aequalis var sonomensis)*	FE	None	1B	Freshwater marsh, mesic grasslands, seasonal pools, riparian scrub.	12
Napa false indigo *(Amorpha californica var napensis)*	None	None	1B	Mixed evergreen forest, open woodland, chaparral often in volcanic substrate.	20
Baker's manzanita *(Arctostaphylos bakeri ssp bakeri)*	None	SR	1B	Forest, chaparral, often on serpentine substrate.	8
The Cedars manzanita *(Arctostaphylos bakeri ssp sublaevis)*	None	SR	1B	Serpentine chaparral/*Cupressus sargentii* woodland.	4
Sonoma manzanita *(Arctostaphylos canescens ssp sonommensis)*	None	None	1B	Chaparral, coniferous forest, sometimes on serpentine or silty loam.	2
Vine Hill manzanita *(Arctostaphylos densiflora)*	None	SE	1B	Dwarf chaparral 'barren' on sandy acidic soil, known from the Sonoma Barren near Forestville.	4
Konocti manzanita *(Arctostaphylos manzanita ssp elegans)*	None	None	1B	Volcanic substrate in chaparral, woodland, and forest openings often on serpentine substrate.	3
Rincon manzanita *(Arctostaphylos stanfordiana ssp raichei)*	None	None	1B	Chaparral, forest openings on rocky substrate.	11
Clara Hunt's milk-vetch *(Astragalus clarianus)*	FE	ST	1B	Grassy areas on rocky, wooded slope in volcanic substrate.	1
Alkali milk-vetch *(Astragalus tener var tener)*	None	None	1B	Grassland, alkaline vernal pools.	1
Big-scale balsamroot *(Balsamorhiza macrolepis var macrolepis)*	None	None	1B	Chaparral, woodland, and grassland, sometimes on serpentine substrate.	2
Sonoma sunshine *(Blennosperma bakeri)*	FE	SE	1B	Vernal pools, swales, ditches, and mesic grasslands. Known only from Santa Rosa Plain and Sonoma area.	26
Thurber's reed grass *(Calamagrostis crassiglumis)*	None	None	2	Coastal scrub and freshwater marsh.	1
The Cedars fairy-lantern *(Calochortus raichei)*	None	None	1B	Serpentine barrens in chaparral/forest. Known only from The Cedars.	8
Swamp harebell *(Campanula californica)*	None	None	1B	Mesic openings and pools in mixed evergreen forest, coastal prairie.	19
White sedge *(Carex albida)*	FE	SE	1B	Wet meadow, bogs, freshwater marsh. Known only from Pitkin Marsh and extirpated occurrences.	3
Bristly sedge *(Carex comosa)*	None	None	2	Seeps, marsh, bogs, in forest and coastal prairie.	2

Common Name (Scientific Name)	Federal Status [a]	State Status [b]	CNPS Status [c]	Habitat Characteristics	Number of CNDDB Records
Deceiving sedge *(Carex saliniformis)*	None	None	1B	Coastal prairie, coastal scrub, meadows and seeps.	3
Mendocino Coast Indian paintbrush *(Castilleja mendocinensis)*	None	None	1B	Coastal bluff scrub, scrub, dunes and prairie, coniferous forest.	1
Pitkin Marsh Indian paintbrush *(Castilleja uliginosa)*	None	SE	1A	Freshwater marsh and mesic grassland. Known from two occurrences from Pitkin Marsh and Trembley's Marsh.	2
Calistoga ceanothus *(Ceanothus divergens)*	None	None	1B	Chaparral and mixed woodland on serpentine and volcanic substrate.	12
Rincon Ridge ceanothus *(Ceanothus confuses)*	None	None	1B	Chaparral, forest, and woodlands on serpentine and volcanic substrate.	13
Sonoma ceanothus *(Ceanothus sonomensis)*	None	None	1B	Chaparral in sandy, serpentine, and volcanic substrate.	17
Dwarf soaproot *(Chlorogalum pomeridianum var minus)*	None	None	1B	Chaparral on serpentine.	1
San Francisco Bay spineflower *(Chorizanthe cuspidata var cuspidata)*	None	None	1B	Coastal bluff scrub, dunes, scrub, and prairie.	1
Woolly-headed spineflower *(Chorizanthe cuspidata var villosa)*	None	None	1B	Coastal dunes, prairie, scrub.	1
Sonoma spineflower *(Chorizanthe valida)*	FE	SE	1B	Coastal prairie.	3
Vine Hill clarkia *(Clarkia imbricata)*	FE	SE	1B	Grassland with sandy soil.	3
Point Reyes bird's-beak *(Cordylanthus maritimus ssp palustris)*	None	None	1B	Coastal salt marsh.	4
Soft bird's-beak *(Cordylanthus mollis ssp mollis)*	FE	SR	1B	Coastal salt marsh.	2
Pennell's bird's-beak *(Cordylanthus tenuis ssp capillaries)*	FE	SR	1B	Serpentine barren in open chaparral and forest.	3
Pygmy cypress *(Cupressus goveniana ssp pigmaea)*	None	None	1B	Coniferous forest. Southernmost stand of pygmy cypress	1
Baker's larkspur *(Delphinium bakeri)*	FE	SR	1B	Coastal shrub. Known from only one occurrence along Salmon Creek.	1
Yellow larkspur *(Delphinium luteum)*	FE	SR	1B	Coastal prairie, scrub, and openings in woodland and chaparral.	5
Geysers dichanthelium *(Dichanthelium lanuginosum var thermale)*	None	SE	1B	Coniferous forest, riparian scrub, mesic grassland along edge of streams in geothermal substrate.	8
Western leatherwood *(Dirca occidentalis)*	None	None	1B	Mixed evergreen forest, woodland, chaparral, and riparian.	2
Dwarf downingia *(Downingia pusilla)*	None	None	2	Vernal pools and swales, mesic grassland..	14
Narrow-leaved daisy *(Erigeron angustatus)*	None	None	1B	Serpentine grassland and open chaparral.	4
Serpentine daisy *(Erigeron serpentinus)*	None	None	1B	Chaparral and serpentine seeps in cypress forest. Known only from The Cedars and along Porter Creek.	1
Supple daisy *(Erigeron supplex)*	None	None	1B	Coastal bluff scrub and prairie.	4
Snow Mountain buckwheat *(Eriogonum nervulosum)*	None	None	1B	Serpentine barrens and rocky slopes in chaparral.	5
Round-leaved filaree *(Erodium macrophyllum)*	None	None	2	Woodland and grassland.	1
Loch lomond button-celery *(Eryngium constancei)*	FE	SE	1B	Vernal pools. Known from only three occurrences.	1

Common Name (Scientific Name)	Federal Status [a]	State Status [b]	CNPS Status [c]	Habitat Characteristics	Number of CNDDB Records
Fragrant fritillary *(Fritillaria liliacea)*	None	None	1B	Grassland, coastal prairie and scrub, openings in woodland, sometimes in serpentine or volcanic substrate substrate.	5
Roderick's fritillary *(Fritillaria roderickii)*	None	SE	1B	Coastal bluff scrub and prairie, grasslands.	1
Two-carpellate western flax *(Hesperolinon bicarpellatum)*	None	None	1B	Chaparral in serpentine substrate.	1
Thin-lobed horkelia *(Horkelia tenuiloba)*	None	None	1B	Chaparral and openings in coniferous forest.	4
Burke's goldfields *(Lasthenia burkei)*	FE	SE	1B	Vernal pools, swales, ditches, and surrounding grassland.	25
Delta tule pea *(Lathyrus jepsonii var jepsonii)*	None	None	1B	Fresh and brackish water marsh.	1
Colusa layia *(Layia septentrionalis)*	None	None	1B	Chaparral, woodland, grassland on sandy and serpentine substrate.	3
Legenere *(Legenere limosa)*	None	None	1B	Vernal pools.	2
Crystal Springs lessingia *(Lessingia arachnoidea)*	None	None	1B	Woodland, coastal scrub, grassland in serpentine substrate.	]2
Coast lily *(Lilium maritimum)*	None	None	1B	Meadows, coastal prairie in open scrub and forest.	6
Pitkin marsh lily *(Lilium pardalinum ssp pitkinense)*	FE	SE	1B	Meadow and mesic grassland with shrubs. Known from occurrences near Sebastopol.	3
Sebastopol meadowfoam *(Limnanthes vinculans)*	FE	SE	1B	Vernal pools, swales, and ditches, and mesic grasslands.	40
Jepson's linanthus *(Linanthus jepsonii)*	None	None	1B	Chaparral, woodland usually in volcanic substrate.	6
Rose linanthus *(Linanthus rosaceus)*	None	None	1B	Coastal bluff scrub.	1
Cobb Mountain lupine *(Lupinus sericatus)*	None	None	1B	Open chaparral and forest.	11
Tidestrom's lupine *(Lupinus tidestromii)*	FE	SE	1B	Coastal dunes with fine sand. Known from fewer than 20 occurrences.	1
Robust monardella *(Monardella villosa ssp globosa)*	None	None	1B	Openings in chaparral, woodland, and coastal scrub. Known from approximately 10 occurrences..	3
Baker's navarretia *(Navarretia leucocephala ssp bakeri)*	None	None	1B	Vernal pools and swales, woodlands, forest, and grassland.	11
Many-flowered navarretia *(Navarretia leucocephala ssp plieantha)*	FE	SE	1B	Vernal pools and swales.	4
Sonoma beardtongue *(Penstemon newberryi var sonomensis)*	None	None	1B	Chaparral in rock outcrops and talus slopes.	2
North Coast semaphore grass *(Pleuropogon hooverianus)*	None	Candidate	1B	Forest, meadows, seeps, vernal pools, and mesic grasslands.	2
Petaluma popcorn-flower *(Plagiobothrys mollis var vestitus)*	None	None	1A	Coastal saltmarsh and mesic grassland. Known from type locality in Petaluma from 1880.	1
Marin knotweed *(Polygonum marinense)*	None	None	3	Salt and brackish marsh. Known from fewer than 15 occurrences.	2
Hickman's cinquefoil *(Potentilla hickmanii)*	FE	SE	1B	Coastal bluff scrub, forest, seeps, meadows, and marshes.	1
California beaked-rush *(Rhynchospora californica)*	None	None	1B	Bogs, seeps, meadows in coniferous forest. Known from fewer than 10 occurrences.	3
Round-headed beaked-rush *(Rhynchospora globularis var globularis)*	None	None	2	Freshwater marsh.	2

Common Name (Scientific Name)	Federal Status [a]	State Status [b]	CNPS Status [c]	Habitat Characteristics	Number of CNDDB Records
Point Reyes checkerbloom *(Sidalcea calycosa ssp rhizomata*)	None	None	1B	Freshwater marsh.	5
Marin checkerbloom *(Sidalcea hickmanii ssp viridis*)	None	None	1B	Chaparral in serpentine substrate.	2
Maple-leaved checkerbloom *(Sidalcea malachroides*)	None	None	1B	Coastal scrub, coastal bluff, open coniferous forest.	7
Marsh checkerbloom *(Sidalcea oregana ssp hydrophila*)	None	None	1B	Meadows, riparian scrub.	1
Kenwood Marsh checkerbloom *(Sidalcea oregana ssp valida*)	FE	SE	1B	Freshwater marsh and mesic grassland. Known from only three occurrences, including two in Kenwood Marsh.	2
Freed's jewel-flower *(Streptanthus brachiatus ssp hoffmanni*)	None	None	1B	Chaparral, woodland in serpentine substrate. Known from approximately 10 occurrences.	4
Socrates Mine jewel-flower *(Streptanthus brachiatus ssp brachiates*)	None	None	1B	Forest and chaparral in serpentine substrate.	7
Secund jewel-flower *(Streptanthus glandulosus var hoffmanni*)	None	None	1B	Chaparral, woodland, grassland often on serpentine substrate.	2
Dorr's Cabin jewel-flower *(Streptanthus morrisonii*)	None	None	1B	Chaparral, coniferous forest, on serpentine substrate. Known from only two small occurrences in The Cedars.	6
Beaked tracyina *(Tracyina rostrata*)	None	None	1B	Woodland and grassland. Known from fewer than 15 occurrences.	1
Showy Indian clover *(Trifolium amoenus*)	FE	None	1B	Coastal bluff scrub and grasslands. Presumed extinct until rediscovered in 1993 and in 1996.	11
Santa Cruz clover *(Trifolium buckwestiorum*)	None	None	1B	Forest, woodland, coastal prairie. Known from about 10 small occurrences.	1
Long-beard lichen *(Usnea longissima*)	None	None	-	Coniferous forest. Non-vascular species of concern.	7

[a] Federal Status Designation:

FE = Listed as "endangered" under the federal Endangered Species Act.
FT = Listed as "threatened" under the federal Endangered Species Act.
PE = Proposed for federal listing as "endangered".
C = A candidate species under review for federal listing.
FSC= Federal Species of Concern; formerly considered a candidate species for listing by the USFWS.

[b] State Status Designation:

SE = Listed as "endangered" under the California Endangered Species Act.
SR = Listed as "rare" under the California Endangered Species Act.
ST = Listed as "threatened" under the California Endangered Species Act.
P = California protected and fully protected species; individual may not be possessed or taken.
CSC=Considered a California Special Concern species by the CDFG.

[c] CNPS Status Designation:

1A = Plants presumed extinct in California.
1B = Plants rare and endangered in California and elsewhere.
2 = Plants rare and endangered in California, more common elsewhere.
3 = Need more information; a watch list.

SENSITIVE NATURAL COMMUNITIES

The CNDDB maintains up-to-date records of sensitive natural communities, those considered rare or threatened in the state. Until recently, the classification of natural communities used by the CNDDB was generally a habitat-based approach defined by dominant or characteristic plant species as described in the *Preliminary Descriptions of the Terrestrial Natural Communities of California*.[5] The classification of natural communities now used by the CNDDB is based on the system described in the *Manual of California Vegetation.*[6] It is a floriscally based system which uses two units of classification called the alliance and the association in the National Vegetation Classification.[7] Although it is just now being used on a broad scale, this quantitative vegetation classification and systematic mapping method will allow conservationists and resource managers a greater understanding of natural ecosystems, their abundance, and their relative security. This new system is now in use by the CDFG, CNPS, State Parks, National Park Service, USGS, and some local agencies, and has been or is currently in use to map the Golden Gate National Recreation Area, Point Reyes National Seashore, Suisun Marsh, Yosemite, Sequoia, and Kings Canyon National Parks, and Napa County.

The purpose of the CNDDB natural community inventory was originally to identify and determine the significance and rarity of the various vegetation types in the state. While identifying and mapping sensitive natural communities continues to be a primary focus of the inventory, a more thorough understanding of all natural communities is essential to accurately define rarity, identify monitoring trends and threats, and broaden the approach to ecosystem-level conservation of biological diversity. This will presumably lead to mapping of vegetation throughout the state using the newer classification system. In the interim, sensitive natural community types recorded in the CNDDB are still generally mapped according to the older Holland classification system. Considerable work is necessary in updating and refining existing mapping records, identifying new occurrences of sensitive natural communities, and expanding the data base to include the identification of high-quality stands of all natural communities.

Several of the natural communities in the county are considered to have a high priority for mapping and protection with the CNDDB. These communities have been designated as sensitive due to rarity and continuing loss as a result of human presence and other factors. No comprehensive mapping of sensitive natural community types in the county has been done: currently there are only 34 occurrence records contained in the CNDDB inventory. As indicated in **Exhibit 4.6-2**, only eight different sensitive natural community types have been mapped by the CNDDB: coastal and valley freshwater marsh, coastal brackish marsh, coastal terrace prairie, central dune scrub, northern coastal salt marsh, northern vernal pool, and valley needlegrass grassland. Each of these natural community types has been greatly reduced in extent due to a number of human-induced activities such as the filling of

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5 *Preliminary Descriptions of the Terrestrial Natural Communities of California,* R. F. Holland, State of California, Department of Fish and Game 1986.

6 *Manual of California Vegetation,* Sawyer and Keeler-Wolf, CNPS Press, 1995.

7 *International Classification of Ecological Communities: Terrestrial Vegetation of the United States,* Grossman et al, , The Nature Conservancy, 1998.

marshlands, leveling and conversion of vernal pools for agricultural crops and development, and historical overgrazing and replacement of native grasslands with non-native species.

Recent changes to Public Resources Code Section 21083.4 were added to CEQA in 2004 requiring that project applications be evaluated for potential impacts resulting from conversions of oak woodlands. A range of mitigation measures are available to the decision making body in cases where a project would have a significant effect on oak woodlands.

WETLANDS

Although definitions vary to some degree, wetlands are generally considered to be areas that are periodically or permanently inundated by surface or ground water, and support vegetation adapted to life in saturated soil. Wetlands are recognized as important features on a regional and national level due to their high inherent value to fish and wildlife, use as storage areas for storm and flood waters, and water recharge, filtration, and purification functions. Technical standards for delineating wetlands have been developed by the Corps and the USFWS which generally define wetlands through consideration of three criteria: hydrology, soils, and vegetation.

Wetlands in the county include areas of salt and brackish water marsh along the shoreline of the coast and bay, riparian habitat along creeks and streams, the vernal pools and swales of the Santa Rosa Plain, and freshwater seeps and springs. **Exhibit 4.6-3** shows the extent of major wetland systems mapped as part of the Sonoma County Agricultural Preservation and Open Space District (SCAPOSD) *Acquisition Plan 2000* based on the National Wetlands Inventory (NWI) of the USFWS and other sources, together with County streams and rivers data. These include the marine and estuarine system of the ocean, bays, and lagoons; the riverine and lacustrine systems of major creeks and channels; and the palustine system comprising freshwater marsh, riparian scrub and woodland, and scattered stock ponds. Some wetland features, such as freshwater seeps, springs, and many of the vernal pools and swales, were generally not identified as part of the NWI because of the large scale of the mapping effort, localized and seasonal nature of these features, and the lack of field verification.

The wetlands associated with the Santa Rosa Plain are of particular significance because of the complexity of the habitat and the presence of a high number of special-status plant and animal species. The wetlands consist of perennial, intermittent, and seasonal features including: the Laguna de Santa Rosa, Mark West Creek, Santa Rosa Creek, tributary drainages, marshes, permanent ponds, vernal pools, and vernal swales. An estimated 90 percent of the original acreage of the vernal pool ecosystem within a 28,000-acre area defined in the Laguna de Santa Rosa Characterization Study has been lost. [8] Attempts to implement the *Santa Rosa Plain Vernal Pool Ecosystem Preservation Plan* stalled in the mid-1990s, with no coordinated efforts to protect and restore this complex ecosystem other than the complex regulatory authority of the U.S. Army Corps of Engineers (Corps), USFWS, CDFG, and Regional Water Quality Control Board (RWQCB). [9]

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8 D.W. Smith Consulting, 1990.

9 CH2M Hill, *Santa Rosa Plain Vernal Pool Ecosystem Preservation Plan*, 1995.

HABITAT CONNECTIVITY

Sonoma County contains a diverse assemblage of both natural and human-influenced environments: the Mendocino Highlands and Mayacamas Range in the north, bisected by the immensely varied Russian River watershed; the cities and agricultural uses on the valley floors juxtaposed with the highly sensitive Laguna de Santa Rosa and the remaining vernal pool complex of the Santa Rosa Plain; the Sonoma Creek watershed to the southeast; and the extensive grasslands to the south bordered by the marshlands of San Pablo Bay. The natural areas that remain are increasingly threatened by continued land conversion, declining water quality, habitat destruction and fragmentation.

Protecting and enhancing habitat connectivity and functional movement corridors between the remaining natural areas is essential to sustaining populations and allowing for the continued dispersal of native plant and animal species. Natural linkages include riparian corridors and drainages, canyons, ridgelines, and corridors across valley floors where impermeable barriers such as dense urban development, exclusionary fencing, and heavily traveled roadways have not yet eliminated options for wildlife movement and plant dispersal. While narrow corridors may be the only option in some locations due to the extent of existing development, habitat linkages are most effective through maintenance of a permeable landscape (i.e., one that allows for uninhibited movement of species across large areas).

Very little study or mapping of opportunities for maintaining and enhancing biodiversity and habitat connectivity have been prepared addressing resources in Sonoma County or the state as a whole. The Missing Linkages conference in November 2000, cosponsored by the California Wilderness Coalition, The Nature Conservancy, the Biological Resource Division of the USGS, the Center for Reproduction of Endangered Species, and California State Parks, provided the first coordinated statewide effort in California to systematically identify, study, and protect wildlife corridors. The resulting report, *Missing Linkages: Restoring Connectivity to the California Landscape*, describes the methodology in identifying large scale landscape linkages, connectivity choke-points, and missing links, and prioritizes these features based on conservation opportunities, presence of target species, overall threat, and existing documentation. [10] [11] While the Missing Linkages conference focused primarily on wildlife movement, it does provide a starting point in considering the importance of linking core wildlands for both wildlife connectivity and plant dispersal.

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10 California Wilderness Coalition et al, 2001.

11 Linkage types defined during the Missing Linkages conference consist of the following:

Landscape linkage = large, regional connections between habitat blocks ("core areas") meant to facilitate animal movement and other essential functions between different sections of the landscape. These linkages are not necessarily constricted, but are essential to connectivity function in the ecoregion. They may include habitat linkages, riparian corridors, etc.
Connectivity choke-point = A narrow, impacted, or otherwise tenuous habitat linkage connecting two or more core areas. Choke-points are essential to maintain landscape-level connectivity, but are particularly in danger of losing connectivity function. An example of a connectivity choke-point is a narrow peninsula of habitat, surrounded by human-dominated matrix, that connects larger core areas. Another example would be an underpass under a major roadway that is critical to allow animal movement between core areas.
Missing link = highly impacts area currently providing limited to no connectivity function (due to intervening development, roadways, etc.), but based on location one that is critical to restore connectivity function. Fore example, a missing link might be a critical section of a major highway that bisects two large core areas but that is currently impermeable to animal movement.

The Missing Linkages conference report identified nine habitat linkages for the North Coast and Bay Area Ecoregions encompassing the Sonoma County vicinity. [12] Linkages extending into and across Sonoma County include Coastal Wetlands for the Pacific Flyway, Russian River Riparian Corridor, Lake Sonoma-Cooley Ranch, North Sonoma Coast-Lake Sonoma, Mayacamas-Mark West, Sonoma Mountain-Mayacamas Mountains, Sonoma Creek, Sonoma Mountain-Burdell Mountain, and the Bay Wetlands. Identification of these regional linkages is an important first step in identifying opportunities for habitat connectivity in the county. However, these regional linkages do not address fragmentation on the local level, nor do they address the need to protect habitat connectivity and provide for movement corridors between core areas and important natural communities in the county.

The Sonoma Ecology Center has been working for the past six years in an effort to establish a habitat corridor across the north end of the Sonoma Valley to provide a critical link between the undeveloped lands of Sonoma Mountain to the west and across the valley floor to the Mayacamas Mountains to the east. The proposed "Sonoma Valley Corridor" is about five miles long and up to three-quarters of a mile wide. It passes across the Sonoma Developmental Center, Sonoma Valley Regional Park, Bouverie Preserve, Oak Hill Farm, Jack London State Park, and private agricultural property. Considerable work remains to provide formal recognition for the proposed corridor, identify necessary land management and access improvements, and secure the land as protected open space. However, this proposed corridor serves as an example of other opportunities which may be available to protect habitat connectivity between core areas in the county.

Protection of priority habitat and areas that provide connectivity to other protected lands was addressed to some degree in the SCAPOSD *Acquisition Plan 2000*. The Natural Resources Acquisition Category of the *Acquisition Plan* is intended to focus land conservation efforts within areas of high natural resource value based on ecological boundaries, large blocks of highly productive habitat, habitat linkages, and essential habitat for special-status species. These include priority oak woodlands, priority forestlands, and priority riparian corridors. Although one of the objectives of the Natural Resources Acquisition Category is to preserve areas and provide connectivity to other protected lands, key habitat linkages have not been identified

Biological Resources – Regulatory Setting

Local, State, and federal regulations have been enacted to provide for the protection and management of sensitive biological and wetland resources. Sonoma County PRMD currently regulates land use and development proposals that may affect sensitive biological resources. The Open Space Element of the existing *General Plan* and the Sonoma County Zoning Code designate certain Streamside Conservation Areas along 54 major rivers and perennial streams and designate Critical Habitat Areas encompassing some of the known sensitive natural communities and wetlands in the county. The Stream Conservation Areas extend outward from the top of the higher bank on each side of a designated stream, and the width varying from 200 feet along the Russian River, to 100 feet along Flatland Riparian Corridors, to 50 feet along Urban Riparian Corridors and Upland Riparian Corridors. Designated Critical Habitat Areas include tidal marshes and estuaries near the Sonoma Creek, Petaluma River, San Antonio Creek, Estero Americano and the mouth of the Russian River; freshwater marshes such as Pitkin, Petaluma and Kenwood marshes; some locations supporting vernal pools, native grassland and oak savanna, special coastal areas (e.g., dunes, pygmy forest and cypress

[12] California Wilderness Coalition et al, 2001.

forest); and preserves owned by the Sonoma County Land Trust, Audubon Society, Academy of Sciences, and Nature Conservancy. The relevant policies of the existing *General Plan* and Zoning Code provide some degree of habitat protection for various species of concern and their habitat through land use regulation and restrictions. Additional protection of sensitive biological resources is provided through the discretionary permit process and its concurrent CEQA review and parallel State and federal permit requirements. Detailed information on the State and federal regulations related to biological resource protection is summarized below, addressing special-status species, sensitive natural communities, wetlands, and habitat connectivity.

Sonoma County PRMD currently regulates land uses and development that may affect biological Resources. The existing *General Plan* and Zoning Code designate certain streamside conservation areas along many rivers and streams and designate critical habitats encompassing many of the rare and endangered plant communities and wetlands in the County. These codes provide habitat protection various species of concern and their habitat. Additional protection of biological resources is provided through the discretionary permit process and its concurrent CEQA review and parallel state and federal permit requirements.

At the State level, the California Department of Fish and Game (CDFG) is responsible for administration of the California Endangered Species Act (CESA), and for protection of streams and waterbodies through the Streambed Alteration Agreement process under Section 1601-1606 of the California Fish and Game Code. Certification from the California Regional Water Quality Control Board (RWQCB) is also required when a proposed activity may result in discharge into navigable waters, pursuant to Section 401 of the Clean Water Act and Environmental Protection Agency (EPA) Section 404(b)(1) Guidelines.

On the federal level, the US Fish and Wildlife Service (USFWS) is responsible for protection of terrestrial and freshwater organisms through implementation of the federal Endangered Species Act (ESA) and the Migratory Bird Treaty Act. [13] The National Oceanic and Atmospheric Administration (NOAA Fisheries) is responsible for protection of anadromous fish and marine wildlife. The US Army Corps of Engineers (Corps) has primary responsibility for protecting wetlands under Section 404 of the Clean Water Act.

SPECIAL-STATUS SPECIES

Special-status species are plants and animals that are legally protected under the State and/or federal ESAs or other regulations as well as other species that are considered rare enough by the scientific community and trustee agencies to warrant special consideration, particularly with regard to protection of isolated populations, nesting or denning locations, communal roosts, and other essential habitat. Species with legal protection under the federal and State ESAs often represent major constraints to development, particularly when they are wide ranging or highly sensitive to habitat disturbance and where proposed development would result in a *take* of these species. *Take*, as defined by the federal ESA, means to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect a threatened or endangered species. *Harm* is further defined by the USFWS to include the killing or harming of

[13] The federal Endangered Species Act (ESA) of 1973 declares that all federal departments and agencies shall utilize their authority to concern endangered and threatened plant and animal species. The California Endangered Species Act (CESA) of 1984 parallels the policies of the ESA and pertains to California species·

wildlife due to significant obstruction of essential behavior patterns (i.e., breeding, feeding, or sheltering) through significant habitat modifications or degradation.

State Regulations

The CDFG has jurisdiction over threatened or endangered species that are formally listed under the CESA. The CESA is similar to the federal ESA both in process and substance, providing additional protection to listed species in California. The CESA does not supersede the federal ESA, but operates in conjunction, with some species having different listing status. The CESA is intended to conserve, protect, restore, and enhance listed species and their habitat. Compliance with the CESA is required when a take is considered likely by the CDFG.

The CDFG also maintains informal lists of California Special Concern (CSC) species. These species are broadly defined as animals that are of concern to the CDFG because of population declines and restricted distribution, and/or because they are associated with habitats that are declining in California. These species are inventoried in the CNDDB, focusing on nesting, roosting, and congregation sites for non-listed species. In addition, wildlife species designated as *Fully Protected* or *Protected* may not be taken or possessed without a permit from the Fish and Game Commission and / or the CDFG.

The CESA prohibits the take of any plant listed as endangered, threatened, or rare. A *rare* plant species is one not presently threatened with extinction but may become endangered if its present environment worsens. State listing of plants began in 1977 with the passage of the Native Plant Protection Act (NPPA). The CESA expanded upon the NPPA and enhanced legal protection for plants. To align with federal regulations, CESA created the categories of threatened and endangered species. It grandfathered all rare animals into the CESA as threatened species, but did not do so for rare plants.

The California Native Plant Society (CNPS) is a non-profit conservation organization dedicated to the preservation of native flora in California. The CNPS has been involved in assembling, evaluating, and distributing information on special-status plant species in the state, as listed in the *Inventory of Rare and Endangered Plants of California* (CNPS *Inventory*). A *List 1A* plant is a species, subspecies, or variety that is considered to be extinct. A *List 1B* plant is considered rare, threatened, or endangered in California and elsewhere. A *List 2* plant is considered rare, threatened, or endangered in California but is more common elsewhere. A *List 3* plant is a species for which the CNPS lacks necessary information to determine whether or not it should be assigned to a list. A *List 4* plant has a limited distribution in California and is considered a *watch list* by the CNPS.

All of the plant species on List 1 and List 2 meet the requirements of the NPPA (Section 1901, Chapter 10) or Section 2062 and 2067 of CESA, and are eligible for state listing. Species maintained by CNPS on Lists 1 and 2 should be considered special-status species under the California Environmental Quality Act (CEQA). Some List 3 plant species also meet the requirements for state listing. Very few List 4 plants are eligible for listing but may be locally important and their listing status could be elevated if conditions change.

The CEQA requires government agencies to consider environmental impacts of discretionary projects and to avoid or mitigate them where possible. Under Section 15380, CEQA provides protection for both State-listed species and for any other species which can be shown to meet the criteria for State listing. The CDFG recognizes that Lists 1A, 1B, and 2 of the CNPS *Inventory* consist of plants that, in a majority of cases, would qualify for listing and these species should be addressed under CEQA review. In addition, the CDFG recommends, and local governments may require, protection of species

which are regionally significant, such as locally rare species, disjunct populations, essential nesting and roosting habitat for more common wildlife species, or plants on the CNPS Lists 3 and 4.

Federal Regulations

The USFWS and NMFS have jurisdiction over species that are formally listed as threatened or endangered under the federal ESA. The federal ESA is a complex law enacted in 1973 to protect and recover plant and animal species in danger of becoming extinct and to conserve their ecosystems, with an ultimate goal being the recovery of a species to the point where it is no longer in need of protection. An *endangered* plant or animal species is one that is considered in danger of becoming extinct throughout all or a significant portion of its range. A *threatened* species is one that is likely to become endangered within the foreseeable future. The USFWS also maintains a list of species proposed for listing as endangered or threatened, and a list of candidate species for which sufficient information is available to support issuance of a proposed listing rule.

It is illegal to take any listed species without specific authorization. Any activity that could result in take of a federally-listed species requires a Section 10 take permit authorization from the USFWS or NMFS. Should another federal agency be involved with permitting the project, such as the Corps under jurisdiction of the Clean Water Act, Section 7 of the ESA requires the federal lead agency to consult with the USFWS and / or NMFS before permitting any activity that may result in take of a listed species. Section 9 of the ESA and its applicable regulations restrict certain activities with respect to endangered and threatened plants. However, these restrictions are less stringent than those applicable to fish and wildlife species. The provisions prohibit the removal of, malicious damage to, or destruction of any listed plant species from areas under federal jurisdiction.

In addition to the protection offered under the ESA, the federal Migratory Bird Treaty Act (MBTA) provides for protection of migratory bird species, birds in danger of extinction, and their active nests. It is illegal to posses or take any bird protected under the act without a depredation permit from the USFWS, which includes protection of eggs, young, and nests in active use. Although the MBTA technically provides for protection of most bird species, it is typically applied as a mechanism to protect active nests of raptors and colonial nesting species through the breeding and nesting season.

SENSITIVE NATURAL COMMUNITIES

In addition to species-oriented management, protecting habitat on an ecosystem-level is increasingly recognized as vital to the protection of natural diversity in the state. This is considered the most effective means of providing long-term protection of ecologically viable habitat, and can include whole watersheds, ecosystems, and sensitive natural communities. Providing functional habitat connectivity between natural areas is essential to sustaining healthy wildlife populations and allowing for the continued dispersal of native plant and animal species.

State and Federal Regulations

Although sensitive natural communities have no legal protective status under the State or federal ESAs, they are provided some level of protection under CEQA. The *State CEQA Guidelines* identify potential impacts on a sensitive natural community as one of six significance criteria. As an example, a discretionary project that has a substantial adverse effect on any riparian habitat, native grassland, valley oak woodland, or other sensitive natural community would normally be considered to have a significant effect on the environment. Further loss of a sensitive natural community could be interpreted as substantially diminishing habitat, depending on its relative abundance, quality and

degree of past disturbance, and the anticipated impacts to the specific community type. Where determined to be a significant under CEQA, the potential impact would require mitigation through avoidance, minimization of disturbance or loss, or some type of compensatory mitigation when unavoidable.

WETLANDS

In recognition of the importance of wetlands, in 1977 the USFWS began a systematic effort to classify and map remaining wetlands in the country, now known as the National Wetlands Inventory Program (NWI). Using the USGS topographic maps as a base, the wetlands mapping effort provides a generalized inventory of wetlands according to the *Classification of Wetlands and Deepwater Habitats of the United States* used by the USFWS. [14] Mapping under the NWI has been prepared through interpretation of aerial photographs, with only limited ground confirmation, which means that a more thorough ground and historical analysis may result in a revision to wetland boundaries in a specific location. The inventory is not an attempt to define the limits of proprietary jurisdiction of any governmental agency.

State Regulations

Jurisdictional authority of the CDFG over freshwater streams, lakes, and associated wetland areas is established under Section 1601 - 1606 of the Fish and Game Code, which pertains to activities that would disrupt the natural flow or alter the channel, bed, or bank of any lake, river, or stream. The Fish and Game Code stipulates that it is unlawful to substantially divert or obstruct the natural flow or substantially change the bed, channel or bank of any river, stream or lake without notifying the CDFG, incorporating necessary mitigation, and obtaining a Streambed Alteration agreement. The Wetlands Resources Policy of the CDFG states that the Fish and Game Commission will strongly discourage development in or conversion of wetlands ... unless, at a minimum, project mitigation assures there will be no net loss of either wetland habitat values or acreage. The Department is also responsible for commenting on projects requiring Corps permits under the Fish and Wildlife Coordination Act of 1958.

In addition, the California RWQCB is responsible for upholding state water quality standards. Pursuant to Section 401 of the Clean Water Act, projects that apply for a Corps permit for discharge of dredge or fill material, and projects that qualify for a Nationwide Permit must obtain water quality certification. The RWQCB has taken an increasing role over regulating wetlands that are hydrologically isolated following the U.S. Supreme Court decision in 2001 regarding the case *Solid Waste Agency of Northern Cook County v. U.S. Army Corps of Engineers* (SWANCC), which limits the jurisdictional authority of the Corps under Section 404. These hydrologically isolated features are now regulated by the RWQCB under authority of Section 401 of the Clean Water Act and the Porter-Cologne Water Quality Control Act.

Federal Regulations

The Clean Water Act was enacted to address water pollution, establish regulations and permit requirements regarding construction activities that affect storm water, dredge and fill material operations, and water quality standards. This regulatory program requires that discharges to surface

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[14] Cowardin et al, U.S. Department of the Interior, Fish and Wildlife Service, 1979.

waters be controlled under the National Pollutant Discharge Elimination System (NPDES) permit program, which applies to sources of water runoff, private developments, and public facilities.

Under Section 404 of the Clean Water Act, the Corps is responsible for regulating the discharge of fill material into waters of the United States. The term *waters* include wetlands and non-wetland bodies of water that meet specific criteria as defined in the Code of Federal Regulations. All three of the identified technical criteria must be met for an area to be identified as a wetland under Corps jurisdiction, unless the area has been modified by human activity. In general, a permit must be obtained before fill can be placed in wetlands or other waters of the U.S. The type of permit depends on the amount of acreage and the purpose of the proposed fill, subject to Corps discretion.

Certain activities in wetlands or unvegetated *other waters* are automatically authorized, or granted a nationwide permit that allows filling where impacts are considered minor. Eligibility for a nationwide permit simplifies the permit review process. Nationwide permits cover construction and fill of waters for a variety of routine activities such as minor road crossings, utility line crossings, streambank protection, recreational facilities, and outfall structures. To qualify for a nationwide permit, a project must demonstrate that it has no more than a minimal adverse effect on the aquatic ecosystem, including species listed under the ESA. This typically means that there will be no net loss of either habitat acreage or habitat value, resulting in appropriate mitigation where fill activities are proposed.

The Corps assumes discretionary approval over proposed projects where impacts are considered significant, requiring adequate mitigation and permit approval. To provide compliance with the EPA's Section 404(b)(1) Guidelines, an applicant must demonstrate that the proposed discharge is unavoidable and is the least environmentally damaging practicable alternative that will achieve the overall project purpose. The 1990 Memorandum of Agreement between the EPA and Corps concerning the Determination of Mitigation under the Guidelines prioritizes mitigation, with the first priority to avoid impacts, the second to minimize impacts, and the third to provide compensatory mitigation for unavoidable impacts.

As noted above, the U.S. Supreme Court SWANCC decision in 2001 has resulted in changes to the regulatory authority of the Corps. The Court determined the Corps' position that its permit authority extended to waters and wetlands that were neither physically navigable nor connected in any way to navigable waters so long as they provided habitat for migratory birds was incorrect. As a result, the Corps no longer hold jurisdiction over hydrologically isolated wetlands.

HABITAT CONNECTIVITY

As noted previously, protecting habitat on an ecosystem-level is essential to sustaining native plant and animal populations. Viability is a function of numerous factors, including the size and health of local plant and animal populations, habitat quality and diversity, habitat connectivity, and ecosystem dynamics such as fire, flooding, seasonal changes, and other natural disturbances, predation, and plant-herbivore pressures. Human-induced changes to the landscape have significant effects on the health and productivity of the natural environment, resulting in habitat loss and fragmentation due to urban, suburban, and even rural development, conversion to agricultural crops, and the network of roadways, flood control modifications to drainages, and other infrastructure that supports our existence.

State and Federal Regulations

Although there are no State or federal laws directly addressing habitat connectivity and preserving biodiversity, the Endangered Species Acts provide for protection of essential habitat for listed species.

Biological Resources – Significance Criteria

According to the *State CEQA Guidelines*, the project would have a significant impact on biological resources if it would:

- Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations or by the California Department of Fish and Game or U.S. Fish and Wildlife Service;

- 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 Game or U.S. Fish and Wildlife Service;

- 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 areas, etc.) through direct removal, filling, hydrological interruption, or other means;

- 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 nursery sites;

- Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance; or

- Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan.

According to CEQA, if the following condition occurs the lead agency (in this case the County) shall find that the project may have a significant effect on the environment: [15]

- The project has the potential to substantially degrade the quality of the environment, substantially reduce the habitat of fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, or reduce the number or restrict the range of an endangered, rare or threatened species.

Biological Resources – Impacts and Mitigation Measures

Impact 4.6-1 Special Status Species
Land uses and development consistent with the Draft GP 2020 could result in loss of populations or essential habitat for special-status species. This would be a significant impact. ***(S)***

Land use and development consistent with the *Draft GP 2020* could result in adverse impacts on special-status species in Sonoma County. As indicated by the distribution of special-status plant and

15 Under *CEQA Guidelines* Section 15065.

animal species shown in **Exhibit 4.6-2**, numerous occurrences are known to occur within or at the periphery of urbanized areas. These include occurrences within the Urban Service Boundaries of Cotati, Petaluma, Santa Rosa, and Rohnert Park in the Santa Rosa, Sebastopol, and Rohnert Park – Cotati Planning Areas. Numerous other known occurrences occur at the periphery of Urban Service Boundaries in the Cloverdale / N.E. County, Healdsburg, Petaluma and Sonoma Valley Planning Areas. Other occurrences are known from outside urbanized areas, in the vicinity of rural communities, or grazing, timber production, and watershed lands. The existing mapping in **Exhibit 4.6-2** only represents the known occurrences of special-status species, generally as a result of either chance encounters or as part of past detailed surveys. This mapping does not represent all populations of special-status species in the County, and future land use activities and development could also affect unknown occurrences where present within the limits of grading and development. Site-specific habitat suitability assessments and possibly detailed surveys would likely be necessary to determine the extent of any special-status species on undeveloped lands proposed for development.

Impacts on special-status species could include direct loss of individuals or localized populations, elimination or degradation of essential habitat, and isolation of subpopulations due to habitat fragmentation. Conversion of existing natural habitat to urban development, roadways and other infrastructure improvements could result in the elimination of populations of special-status species where present within the limits of proposed grading and development. The installation of vineyards, row crops, and other actively managed agricultural uses, timber harvesting, mining extraction, and other activities could also result in the elimination of essential habitat for special-status species. Even if the population is deliberately avoided, new development and intensively managed land practices could result in fragmentation of the existing habitat and leave the special-status species population at risk to *extirpation* (local extinction). Isolated subpopulations may be particularly vulnerable to extirpation due to natural or man-made influences such as fire and vegetation management practices, intensive grazing or agricultural production, invasion by highly aggressive non-native species which can out-compete or deplete the native flora or fauna, and other factors. Indirect impacts could include disruption of critical functions affecting reproductive success, degradation of habitat quality to such an extent that occupied habitat is no longer suitable for individual survival, and other influences.

Local, State, and federal regulations provide varying levels of protection for special-status species, depending on a number of factors including legal protective status, rarity and distribution, and magnitude of the potential impact on essential habitat, specific occurrence and overall population levels, and take of individual plants or animals. Activities requiring discretionary approvals by the County, State, and federal agencies provide for the greatest oversight because proposed activities must be evaluated for their potential impact on special-status species and other sensitive biological resources. These include most development applications, which are reviewed under CEQA and NEPA when federal funds or authorization is required, timber applications which must be reviewed for compliance with the Forest Practice Act, and mining activities which must comply with the Surface Mining and Reclamation Act.

However, some land use activities permitted under the *Draft GP 2020* which require only a ministerial permit application may receive little or no review by local, State or federal authorities.[16] These include most agricultural uses and ministerial permits for construction of a single family home, garage

[16] *Ministerial* describes a governmental decision involving little or no personal judgment by the public official as to the wisdom or manner of carrying out the project. The public official merely applies the law to the facts as presented but uses no special discretion or judgment in reaching a decision. Typical ministerial actions include agriculture activities and residential development on existing lots including building permits, grading permits, and well and septic system permits.

and other associated buildings, or grading for a new driveway on a parcel where residential use is allowed. There remains a concern over the potential for adverse impacts on sensitive resources such as special-status species for land use activities and ministerial permits for which the County has no discretionary authority. It is important to note, however, that federal and State regulations also provide for the protection and management of special-status species. Such laws against taking of listed species and related permit requirements for some land use activities proposed within essential habitat for these species also contribute to reducing potential impacts on special-status species.

The Open Space and Resource Conservation Element of the *Draft GP 2020* contains policies which would provide for the identification and protection of special-status species as part of development review. The degree to which populations and essential habitat for special-status species is adequately protected depends in part on how stringently the policies are applied and enforced, together with regulatory oversight and resource management by State and federal agencies. Figures OSRC-5a through OSRC-5i in the Open Space and Resource Conservation Element designate Biotic Habitat Areas for each planning area, shown in composite form for the entire county in **Exhibit 4.6-2**. Biotic Habitat Areas form the known extent of sensitive biological resources in the county, and include marshes and wetlands, sensitive natural communities, habitat connectivity corridors, and mapped occurrences of special-status species.

Policy **OSRC-7b(1)(a)** would require a site assessment and adequate mitigation for ministerial permit applications proposed within locations mapped as Special-Status Species Habitat. Priorities for adequate mitigation are also specified in the policy, together with a recommendation that mitigation required by the County should be consistent with permit requirements of federal and State regulatory agencies, to the extent feasible. Policy **OSRC-7b(2)** would call for a referral to appropriate regulatory agencies for discretionary projects proposed in areas mapped as Biotic Habitat Areas, and would require a site assessment, compliance with agency requirements and adequate mitigation pursuant to the priorities in Policy **OSRC-7b(1)(a)**. Policy **OSRC-7c** pertains to discretionary projects and larger ministerial permits outside of designated Biotic Habitat Areas and would call for referral to appropriate regulatory agencies, and where warranted, would require a site assessment and adequate mitigation pursuant to priorities in **OSRC-7b(1)(a**). In addition, Policy **OSRC-7d** would provide notification to permit applicants of possible requirements of regulatory agencies.

Mitigation priorities outlined in Policy **OSRC-7b(1)(a)** would range from preferred avoidance to creating replacement habitat off-site to achieve no net loss. This range of mitigation options would generally be consistent with that used by regulatory agencies. It should be noted that the significance of the potential impact on special-status species and corresponding need for mitigation can vary depending on a number of factors. These factors include the actual status of the affected species, magnitude of disturbance, vulnerability of the population to extirpation, and other considerations. Those special-status species which are actually listed species under the Endangered Species Acts (i.e., rare, threatened, or endangered) generally represent the highest potential constraint to proposed development, are much more stringently regulated, and typically are considered to have a higher need for habitat avoidance. The feasibility of mitigation options must also be considered in developing appropriate mitigation for special-status species. Habitat creation may not be feasible, or may be of questionable success and may only be allowed by regulatory agencies as part of a combined mitigation plan that includes permanent protection of other off-site locations known to support the species of concern. The policies related to special-status species provide for the appropriate review process utilized by qualified professionals and regulatory agencies.

Habitat Conservation Plans or Natural Community Conservation Plans are often times used to provide a coordinated approach to protecting listed special-status species while still recognizing the rights of private property owners. No conservation plans have been adopted for all or parts of Sonoma County,

but a draft *Santa Rosa Plain Vernal Pool Ecosystem Preservation Plan* was prepared in the 1990s and continues to be acknowledged in the *Draft GP 2020*. Policy **OSRC-7r** would continue to recommend implementation of the plan and the need to protect the associated special-status species. Policy **OSRC-7j** would also encourage the consideration of developing Habitat Conservation Plans for specific areas or the entire county to address protection of special-status species.

Sonoma County is participating in the FishNet4C program, which is intended to meet the requirements of the Federal ESA in protecting anadromous salmonids and their habitats. Current activities are focused upon development of improved road and channel construction and maintenance by County and SCWA staff. Policy **OSRC-8c(10)(b)** would specify that stream crossings for roads and utility lines be built and maintained to meet FishNet4C and County standards. However, there is no other reference to continued participation in the FishNet4C program which is essential to improving habitat conditions for listed anadromous fish and other aquatic species.

In summary, the above regulations and proposed policies of the *Draft GP 2020* governing special-status species would reduce the impacts of habitat changes and new development on these species. However, because there remains a potential for continued loss of unknown populations of special-status species or loss of essential habitat for listed species as a result of activities which are not subject to County permit requirements, this would be considered a significant impact. Since the option of requiring detailed biotic surveys to determine project impacts requires a discretionary permit review, the County would have to subject all land use activities from building permits to growing crops and raising animals to costly studies and public hearings. To do so could jeopardize the County goal of agricultural protection and economic viability.

Mitigation Measure 4.6-1 Add a new policy to Section 3.1 of the Open Space and Resource Conservation Element to encourage continued participation in the FishNet4C program:

> **Policy OSRC-7v**: Continue to actively participate in the FishNet4C program and work cooperatively with participating agencies to implement recommendations to improve and restore aquatic habitat for listed anadromous fish species and other fishery resources.

Significance After Mitigation Adoption of the relevant policies in the Open Space and Resource Conservation Element, the new policy in Mitigation Measure 4.6-1, and oversight by regulatory agencies entrusted with enforcement of State and federal regulations addressing the protection and management of special-status species, would serve to reduce potential adverse impacts on special-status species associated with the *Draft GP 2020*. To the extent that the location of special-status species occurrences are known or discovered through the permit review process, this would be a less than significant impact. However, since not all occurrences of special-status species are known and some land uses are not regulated, this would be a significant unavoidable impact. (**SU**)

Responsibility and Monitoring The Board of Supervisors would be responsible for adopting the policy proposed in Mitigation Measure 4.6-1 as part of the *GP 2020.* The PRMD would be responsible for monitoring implementation.

Impact 4.6-2 Sensitive Natural Communities

*Land uses and development consistent with the Draft GP 2020 could result in loss of sensitive natural communities. This would be a significant impact. (**S**)*

Land uses and development consistent with the *Draft GP 2020* could result in adverse impacts to sensitive natural communities. **Exhibit 4.6-2** shows the mapped extent of sensitive natural

communities known in Sonoma County, which includes areas of native grasslands, marshlands, coastal terrace prairie, central dune scrub, and northern vernal pool. Designated Streams, which encompass perennial and intermittent streams, are also generally considered to support riparian habitat, a sensitive natural community type. However, some segments of stream channels supporting riparian habitat may not be included in the USGS mapping of intermittent and perennial streams used as a basis for the designations, and other occurrences of sensitive natural communities are not known at this time. **Exhibit 4.6-2** represents the known occurrences of sensitive natural communities, generally described as a result of past detailed surveys or conventional mapping. Site-specific assessments and possibly detailed surveys may be necessary to determine the extent of any sensitive natural communities on undeveloped lands.

As indicated by the distribution of sensitive natural communities shown in **Exhibit 4.6-2**, numerous occurrences are located within or at the periphery of urbanized areas, particularly the riparian scrub and woodland habitat along designated streams. These include designated streams within the Urban Service Boundaries of Cloverdale, Cotati, Healdsburg, Petaluma, Rohnert Park, Santa Rosa, Sebastopol, Sonoma, and Windsor. Other known occurrences are located outside urbanized areas, in the vicinity of rural communities, or grazing, timber production, and watershed lands. Potential impacts on mapped and unknown occurrences of sensitive natural communities include all or partial conversion to developed uses, vineyards and other agricultural activities, and fragmentation or modification to such an extent that the resource no longer functions as a natural community. Other human-generated influences such as fire suppression, intensive grazing or agricultural production, invasion by highly aggressive non-native species which can out-compete or deplete the native flora, and other factors may also adversely affect sensitive natural communities.

The Open Space and Resource Conservation Element of the *Draft GP 2020* contains policies that would provide for the identification and protection of sensitive natural communities as part of development review. Figures OSRC-5a through OSRC-5i in the Open Space and Resource Conservation Element designate Biotic Habitat Areas for each planning area, shown in composite form for the entire county in **Exhibit 4.6-2**. Policy **OSRC-7b(1)(c)** would call for a referral to CDFG, for ministerial permit applications proposed within locations mapped as Sensitive Natural Communities, and would require a site assessment and adequate mitigation where agency information indicates sensitive resources could be affected. Priorities for mitigation follow those specified for special-status species listed in Policy **OSRC-7b(1)(a)**. Policy **OSRC-7b(2)** would call for a referral to the appropriate regulatory agencies for discretionary projects proposed in areas mapped as Biotic Habitat Areas, which should include Designated Streams and mapped sensitive natural communities, and would require a site assessment, compliance with agency requirements and adequate mitigation pursuant to the priorities in Policy **OSRC-7b(1)(a)**. Policy **OSRC-7c** would address discretionary projects and larger ministerial permits outside of designated Biotic Habitat Areas. The policy would call for referral to appropriate regulatory agencies, and, where warranted, would require a site assessment and adequate mitigation pursuant to priorities in **OSRC-7b(1)(a)**. However, Policy **OSRC-7b(1)(a)** would pertain specifically to Special-Status Species Habitat, and does not include the review process outlined in **OSRC-7b(1)(c)**.

As discussed under *Impact 4.6-1 Special Status Species*, mitigation priorities outlined in Policy **OSRC-7b(1)(a)** would range from preferred avoidance to creating replacement habitat off-site to achieve no net loss. While this range of mitigation options is again would generally be consistent with that used by regulatory agencies, the significance of the potential impact on sensitive natural communities and corresponding need for mitigation is appropriately less rigorous than that used for special-status species. Appropriate mitigation also depends on feasibility of creating replacement habitat or restoring areas of sensitive natural communities affected by proposed development. These various considerations are not specifically acknowledged in the policies related to sensitive natural

communities, but the policies would provide for the appropriate review process to be utilized by qualified professionals and regulatory agencies.

Section 3.2 of the Open Space and Resource Conservation Element includes detailed policies related to the protection of riparian corridors, a sensitive natural community type of particular concern in Sonoma County. Policy **OSRC-8c** would serve to protect riparian corridors by requiring that land use and development comply with defined principles until an ordinance is adopted by the County. These principles would include restricting removal of riparian vegetation, limiting construction of new structures and roads, prohibiting installation of new fencing designed to exclude wildlife, and controls on agricultural cultivation. Stream conservation areas would be established along Designated Streams with a setback distance of 200 feet from the top of the higher bank along the Russian River and 100 feet from other designated riparian corridors. Under Policy **OSRC-8f**, permit applicants would be notified of possible federal and state permit requirements. Policy **OSRC-8e** specifies referral of discretionary permit applications to CDFG, with site assessment and appropriate mitigation required if riparian corridors may be adversely affected. Policy **OSRC-8h** would provide for review of riparian corridor designations, evaluation of policy effectiveness, assessment of the degree to which setback reductions are approved, and consideration of need for additional protective policies at least every five years.

Exhibit 4.6-5 provides a comparison of currently protected and proposed Riparian Corridors under the *Draft GP 2020* for the unincorporated areas of Sonoma County. As indicated in **Exhibit 4.6-5**, currently protected Riparian Corridors extend over an estimated 473 miles and approximately 11,396 acres, based on standard setbacks from the Russian River and other perennial streams. This represents less than 14 percent of the intermittent and perennial streams in Sonoma County, providing limited protection for riparian habitat and the associated aquatic habitat, water quality purification, and groundwater recharge functions. By comparison, proposed Riparian Corridors in the *Draft GP 2020* would extend over an estimated 3,280 miles and approximately 81,947 acres, based on proposed standard setbacks. Inside the proposed Urban Service Areas, the additional Riparian Corridors include an estimated 50 miles of intermittent streams, with no change in the designations along the Russian River and only about one-half mile and 100 acres of additional designated area along perennial streams. This change within the proposed Urban Service Areas collectively would represent two percent of the total proposed Riparian Corridors. The vast majority of the additional designated streams would occur outside of proposed Urban Service Areas in locations with Agricultural and Resources and Rural Development land use designations, representing 87 percent of the total proposed Riparian Corridors. The remaining 11 percent increase in designated streams would occur outside of proposed Urban Service Areas in locations with Rural / Urban Residential, Commercial / Industrial, and Public / Quasi Public land use designations.

Exhibit 4.6-5
Land Use Analysis of Current/Proposed Riparian Corridors in Unincorporated Areas [17]

Currently Protected Riparian Corridors			
General Plan Land Use Designation	***Russian River [18] (miles/acres)***	***Other Perennial Streams [19] (miles/acres)***	***Total (miles/acres)***
Inside Proposed Urban Service Areas	6.28 / 460	15.55 /283	21.83 / 743
Outside Proposed Urban Service Areas	54.57 / 3,437	396.91 / 7,216	451.48 / 10,653
Proposed Land Use Designations			
Agricultural	28.65 / 1,807	132.21 / 2,404	160.86 / 4,211
Resources & Rural Development	18.22 / 1,077	216.49 / 3,936	234.71 / 5,013
Rural & Urban Residential	3.19 /281	36.36 / 661	39.55 / 942
Commercial-Industrial	1.37 / 40	3.05 / 55	4.42 / 95
Public & Quasi-Pubic	3.14 / 232	8.80 / 160	11.94 / 392
Totals	***60.85 / 3,897***	***412.46 / 7,499***	***473.31 / 11,396***

Source: PRMD and Environmental Collaborative

17 Uses 2002 Open Space Plan Maps.

18 Acreage estimates for Russian River corridor include the channel where shown on maps and 200 feet from channel banks on both sides. All acreage analysis is based on land use designations and Urban Service Areas shown on *Draft GP 2020* Land Use Plan maps. All acreage estimates include overlap where streams intersect.

19 No intermittent streams are currently designated as protected Riparian Corridors. Current corridor setback distances are 50 feet from top of bank for Urban and Upland corridors, and 100 feet from top of bank for Flatland corridors. An assumed average corridor width of 75 feet (on each side of stream center-line) was used as detailed data separating Flatland Corridors from Urban/Upland Corridors is not available. Acreage estimates do not include area contained within top of banks of stream channel as this data is not available.

Exhibit 4.6-5 (continued)
Land Use Analysis of Current/Proposed Riparian Corridors

Proposed Designated Streams in the Draft GP 2020 [20]				
General Plan Land Use	***Russian River (miles / acres)***	***Other Perennial Streams*** [21] ***(miles / acres)***	***Intermittent Streams (miles / acres)***	***Totals (miles / acres)***
Inside Proposed Urban Service Area	6.28 /460	16.08 /390	49.94 / 1,211	72.30 / 2,061
Outside Proposed Urban Service Areas	54.57 / 3,437	1,134.32 / 27,495	2,019.54 / 48,954	3,208.43 / 79,886
Proposed Land Use Designations				
Agricultural	28.65 / 1,807	430.75 / 10,441	765.55 / 18,557	1,224.95 / 30,805
Resources & Rural Development	18.22 / 1,077	586.48 / 14,216	1,027.79 / 24,914	1,632.49 / 40,207
Rural & Urban Residential	3.19 / 281	50.59 /1,226	122.78 / 2,976	176.56 / 4,483
Commercial-Industrial	1.37 / 40	4.00 / 97	6.35 / 154	11.72 / 291
Public & Quasi-Public	3.14 / 232	62.50 / 1,515	97.07 / 2,353	162.71 / 4,100
Totals	***60.85 / 3,897***	***1,150.40 / 27,885***	***2,069.73 / 50,165***	***3,280.73 / 81,947***

Source: PRMD and Environmental Collaborative

20 Uses stream data from USGS topo maps.

21 Proposed corridor setback distances are 100 feet from top of bank for Designated Streams. Acreage estimates do not include area contained within top of banks of stream channel as this data is not available. Acreage estimates also do not consider any existing developed condition within general streamside conservation area setbacks, which would typically be an allowed use (see provisions in proposed Policy OSRC-8c for specific allowances), and do not consider possible reduction to proposed setback distance which may be allowed under Policy OSRC-8c13. These exceptions would collectively reduce the total acreage estimates contained within streamside conservation areas for protected streams, but this data is not available.

Overall, the additional Riparian Corridors and related policies would expand protection of important riparian corridors in Sonoma County. The riparian-related policies would not affect existing crop or timber production, with only limited changes for replanting, and future assessment for grazing. As specified under Policy **OSRC-8c(3)**, new agricultural cultivation would be allowed within the outer half of the streamside conservation area along designated intermittent streams, but not within the streamside conservation area along perennial streams and not where slopes are 20 percent or greater. Policy **OSRC-8c(4)** would allow for replanting of crops where legally established, but no closer than 25 feet from the top of higher bank on each side of a riparian corridor. This policy would also encourage the development of incentives which may serve to increase setback distances where crops currently occur within stream conservation areas. Policy **OSRC-8c(6)** would allow for continued livestock grazing but would prohibit confined animal operations and mechanical removal of vegetation within stream conservation areas, and would encourage use of best management practices to improve riparian habitat values. Policy **OSRC-8g** would call for conducting a comprehensive study of the effects of grazing in riparian corridors, involving resource agencies, landowners and interested public, and developing recommendations for additional policies that may be needed to ensure appropriate protection, if warranted. Timber operations conducted in accordance with an approved timber harvest plan would be allowed as specified under Policy **OSRC-8c(8)**, but not within 25 feet of the top of the higher bank. In addition, with the exception of new crop planting and replanting, Policy **OSRC-8c(13)** would allow for a reduction of up to 50 percent, of any setback where no net loss of sensitive riparian habitat and an overall improvement of riparian functions can be achieved.

Policy **OSRC-7n** would address valley oak habitat, one of several tree-dominated sensitive natural community types in Sonoma County, and the need to reevaluate current designations and adequacy of mitigation requirements. Other tree-dominant sensitive natural community types not specifically addressed by policies in the *Draft GP 2020* are the few remaining stands of old growth redwood and Douglas fir forest in Sonoma County. Some of these stands are protected in designated open space such as Armstrong Redwoods State Park and The Grove of the Old Trees in West Occidental. Accurate mapping of the few remaining old growth stands on private lands is not available, but stands along the South Fork Gualala River, Haupt Creek, Willow Creek, and Austin Creek watersheds could be affected. These stands may be subject to increasing pressure for timber harvest because of their high economic value, but any proposed harvest plans are subject only to State Forest Practice Act regulations. Policy **OSRC-12e** would serve to prohibit the conversion of timberlands to non-timber uses unless they qualify for a timber conversion exemption, they provide an overriding benefit, or they result in no net loss of timberland.

While the above regulations and the *Draft GP 2020* policies and programs would reduce impacts to Sensitive Natural Communities, they would not be sufficient to reduce them to a less-than-significant level for two reasons. First, the location of all potentially sensitive natural communities are not known, making the regulation of ministerial permits ineffective in assessing project impacts. Second, since the option of requiring detailed biotic surveys to determine project impacts requires a discretionary permit review, the County would have to subject all land use activities from building permits to growing crops and raising animals to costly studies and public hearings. To do so would seriously jeopardize the County goal of agricultural protection and economic viability. Therefore, this would be a significant impact.

Mitigation Measure 4.6-2 Policies pertaining to sensitive natural communities in the *Draft GP 2020* could be revised to include new language encouraging protection of the remaining old growth forests in Sonoma County, and to improve protection of riparian corridors. This consists of the following amendments to the Open Space and Resource Conservation Element:

Mitigation Measure 4.6-2(a) Add a new policy to Section 3.1 of the Open Space and Resource Conservation Element as follows:

> **Policy OSRC-7v**: Identify and consider designation of old growth redwood and Douglas fir forest as sensitive natural communities. Encourage preservation and public acquisition of any remaining old growth redwood and Douglas fir forests in private ownership in the county. Because of their rarity and biological importance, these sensitive natural community types should be made priorities for protection through conservation easements, fee title, or other mechanisms.

Mitigation Measure 4.6-2(b) Revise Policy **OSRC-8c(10)(a)** to ensure restrictions do not result in additional adverse impacts on biological resources as follows:

> **Policy OSRC-8c**: Rezone to the Biotic Resources combining zoning district all lands within the streamside conservation areas. Adopt an ordinance which provides for their protection in conformance with the following principles. Until the ordinance is adopted, require that land use and development comply with these principles:
>
> (Policy items 1-9 do not change)
>
> (10) Allow stream crossings for roads and utility lines subject to the following design requirements:
>
> (a) Be at 75 to 90 degrees to the channel, <u>except when biological impacts to accommodate this approach would be greater</u>.
>
> (Policy items (b) through (e) do not change.)
>
> (Policy items 11 through 13 do not change.)

Significance After Mitigation Adoption of the policies as outlined in Mitigation Measures 4.6-2(a) and 4.6-2(b), together with information programs, and oversight by regulatory agencies entrusted with enforcement of State and federal regulations addressing the protection and management of sensitive natural communities, would reduce potential adverse impacts on sensitive natural communities, but not to a less-than-significant level. Therefore, this would remain a significant unavoidable impact. (**SU**)

Responsibility and Monitoring The Board of Supervisors would be responsible for adopting the policies proposed in Mitigation Measures 4.6-2(a) through 4.6-2(b) as part of the *GP 2020*. The PRMD would be responsible for monitoring implementation.

Impact 4.6-3 Wetlands

Land uses and development consistent with the Draft GP 2020 could result in direct or indirect impacts on jurisdictional wetlands and unvegetated other waters. This would be a less-than-significant impact. ***(LTS)***

Land uses and development consistent with the *Draft GP 2020* could result in the direct loss or modification to existing wetlands. Affected wetlands could include both the wetland-related sensitive natural community types described above, as well as areas of open water, degraded and modified streams and channels, unvegetated waters, and isolated seasonal wetlands now dominated by non-native species.

Exhibit 4.6-3 shows the general extent of known wetlands in the county, many of which occur within or near Urban Service Areas. In addition to the designated streams, known wetlands include the complex of vernal pools in the Santa Rosa Plain and freshwater marsh along the Laguna de Santa Rosa in the Santa Rosa, Sebastopol, and Rohnert Park – Cotati Planning Areas; the Petaluma Marsh and Estero Americano in the Petaluma Planning Area; brackish water and coastal salt marsh along the fringe of San Pablo Bay in the Petaluma and Sonoma Valley Planning Areas; and the smaller but important known freshwater marshes such as Pitkin Marsh and Kenwood Marsh in the Santa Rosa and Sebastopol Planning Area.

These mapped wetlands would be most vulnerable to potential direct impacts as a result of future development. However, mapping of all jurisdictional wetlands in the county is not available at this time. Future development or other land use activities outside Urban Service Areas could also affect wetlands. A site-specific wetland delineation would be necessary to determine the extent of possible jurisdictional waters where wetlands may be present.

Indirect impacts to wetlands could include an increase in sedimentation due to construction grading and ground disturbance, an increase in erosion due to increased runoff volumes generated by impervious surfaces, and an increase in water quality degradation due to increased levels of non-point pollutants. Water quality degradation may occur even when wetlands and unvegetated channels are avoided by proposed development if setbacks are inadequate to provide critical vegetation filtration functions.

The Open Space and Resource Conservation Element of the *Draft GP 2020* contains policies which would provide for the identification and protection of jurisdictional wetlands and other waters. Figures OSRC-5a through OSRC-5i in the Open Space and Resource Conservation Element designate Biotic Habitat Areas for each planning area, shown in composite form for the entire county in **Exhibit 4.6-2**. Policy **OSRC-7b(1)(b)** would require a site assessment and adequate mitigation for ministerial permit applications proposed within designated Marshes and Wetlands. This policy would use the same mitigation policies identified for Special-Status Species Habitat, but would also specify a 100 foot setback from the edge of the delineated wetland. The setback may be reduced to a minimum of 50 feet based upon site assessment and appropriate mitigation, but may be reduced further if there is no other feasible location to accommodate proposed improvements and adequate mitigation is provided. This approach, with an incentive of providing a 100 foot setback from wetlands and an allowance for a reduced setback with appropriate mitigation should serve to effectively protect known wetlands.

Policy **OSRC-7b(2)** would call for a referral to the appropriate regulatory agencies for discretionary projects proposed in areas containing designated Marshes and Wetlands, and would require a site assessment, compliance with agency requirements and adequate mitigation pursuant to the priorities in Policy **OSRC-7b(1)(a)**. However, Policy **OSRC-7b(1)(a)** would pertain specifically to Special-Status Species Habitat, and would not include the wetland setback standards called for in **OSRC-7b(1)(b)**.

Policy **OSRC-7c** pertains to discretionary projects and larger ministerial permits outside of designated Biotic Habitat Areas. This policy would call for a referral to the appropriate regulatory agencies, and where warranted, would require a site assessment and adequate mitigation pursuant to priorities in **OSRC-7b(1)(a)**.

In addition to policies intended to protect existing wetlands, several policies of the *Draft GP 2020* focus on programs to restore and enhance important wetland resources in the county. Policy **OSRC-7s** would call for the development of comprehensive programs to preserve and restore marshlands associated with the Laguna de Santa Rosa and the Petaluma River, as well as freshwater

marshes such as Pitkin, Kenwood, Cunningham, and Atascadero Marshes. Policy **OSRC-7u** would focus on developing comprehensive programs for preservation and restoration of the San Pablo Bay area, which contain important tidal wetlands and diked historical baylands.

As discussed in *Impact 4.6-2 Sensitive Natural Communities*, the *Draft GP 2020* includes additional Riparian Corridors and expanded policies which would serve to protect wetlands and other waters associated with riparian corridors along perennial and intermittent streams in Sonoma County. Ephemeral drainages provide important filtration functions and often support wetlands and riparian vegetation as well, but this varies considerably based on a number of factors. Ephemeral drainages were not included in the additional designated streams because their locations are unknown and undefined at this time. Policy **OSRC-8e** would provide for consideration of both Riparian Corridors and ephemeral streams during environmental review of discretionary permits, and Policy **OSRC-8h** would include consideration of ephemeral streams as part of the review of riparian corridor designations at least every five years. It should also be noted that federal and State regulations require authorization and adequate mitigation for potential impacts on jurisdictional wetlands.

In summary, the above regulations and proposed policies of the *Draft GP 2020*, combined with federal and State wetland regulations, would reduce the impacts of land uses and development on jurisdictional wetlands and other waters. While there is a possibility that future land uses that do not require permits could affect some unknown occurrences of wetlands, this likelihood is lower than for special-status species and sensitive natural communities. Most of the valley floors and lower elevations where these uses have historically been concentrated have already been extensively modified over the past 150 years, eliminating most occurrences of sensitive natural communities. Areas which continue to support wetlands, riparian corridors, and vernal pools on valley floors tend to be constrained by physical limitations such as seasonal flooding or permanent inundation. These limitations continue to minimize the potential for use in these areas, reducing the likelihood that they would be eliminated. State and federal regulations would continue to protect wetlands in Sonoma County, including stream and associated riparian habitat, marshlands, and vernal pools. Therefore, this would be a less-than-significant impact.

Mitigation Measure 4.6-3 None Required.

Impact 4.6-4 Wildlife Habitat and Movement Opportunities

Land uses and development consistent with the Draft GP 2020 would result in a reduction of existing wildlife or fish habitat, contribute to habitat fragmentation, and result in obstruction of movement opportunities. Aspects of the applicable policies contained in the Draft GP 2020 would serve to partially address these impacts, but the conversion, fragmentation, and obstruction would be a significant impact. ***(S)***

Land uses and development and land use activities consistent with the *Draft GP 2020* would result in a substantial reduction in existing wildlife and fish habitat, and could interfere with the movement of native fish and wildlife species. As discussed under *Impacts 4.6-1, 4.6-2,* and *4.6-3*, numerous policies in the Open Space and Conservation Element would serve to avoid or minimize adverse impacts on sensitive biological and wetland resources, and would require adequate mitigation during review of individual development applications. Many policies also would support public acquisition of designated Biotic Habitat Areas, as well as the restoration and enhancement of features of regional biological significance such as the Laguna de Santa Rosa, Petaluma Marsh, and baylands of San Pablo Bay.

A large portion of the estimated 162,822 acres (see **Exhibit 4.1-1**) designated for Land Intensive Agriculture (74,255 acres), Residential (81,895 acres), Commercial (3,960 acres), and Industrial

(2,712 acres) land uses under the *Draft GP 2020* remain undeveloped today, and the existing habitat could be eventually affected by designated uses over the next 15 years. An additional 561,503 acres (see **Exhibit 4.1-1**) are designated for Diverse Agriculture (68,845 acres) and Resources & Rural Development (492,658 acres), where implementation of allowed uses could also result in degradation of existing habitat, such as forest, woodland, chaparral, and grassland. While comparison of land use designations for the existing *General Plan* and the *Draft GP 2020* shows a net reduction of about 90 acres of lands proposed for urban uses (i.e., Residential, Commercial, and Industrial land uses), the cumulative effect of land use and development could result in degradation and loss or fragmentation of wildlife habitat.

Policy **OSRC 7f** would call for the review of Biotic Habitat Area designations and related policy issues at least every five years, and the development of recommendations for additional policies if warranted, including methods to identify and monitor cumulative habitat loss and establishment of thresholds to protect sensitive resources. Some policies would call for the County to support voluntary programs for habitat restoration, removal and control of invasive exotics, and providing information to the public on habitat protection and management. Still other policies would encourage landowners to voluntarily participate in protecting tree resources, utilize native species in landscaping, and install wildlife friendly fencing. All of these policies and programs would serve to identify and protect important habitat, define necessary restrictions and standards to conserve designated Biotic Habitat Areas, and improve public understanding of sensitive resources in Sonoma County. However, they collectively would not fully address or mitigate the potential impacts of land uses and development consistent with the *Draft GP 2020* on existing wildlife habitat.

In addition to the direct loss of existing habitat, the fragmentation and obstruction of opportunities for native species movement and dispersal is of critical importance as these changes may lead to isolation of localized populations or even large areas maintained as open space. Several aspects of the *Draft GP 2020* serve to partially address the issues of habitat fragmentation and connectivity. The expanded Riparian Corridors in the *Draft GP 2020* would provide greater oversight of streams and their critical function as movement corridors for aquatic and terrestrial wildlife. Two proposed Habitat Connectivity Corridors have been designated as Biotic Habitat Areas in the *Draft GP 2020*, consisting of the "Sonoma Valley Corridor" at the north end of the Sonoma Valley and "Laguna West Corridor" along Blucher Creek between Cotati and Sebastopol. Based on work by the Sonoma Ecology Center, the Sonoma Valley Corridor is intended to provide a critical link between the undeveloped lands of Sonoma Mountain to the west and across the valley floor to the Mayacamas Mountains to the east. The second corridor along Blucher Creek was identified during preparation of the *Draft GP 2020* in response to the increasing isolation of the Laguna de Santa Rosa from the remaining undeveloped lands of the upper watershed.

Several policies in the *Draft GP 2020* address habitat connectivity and wildlife movement opportunities. Policy **OSRC-7b(1)(d)** would provide limited direction for ministerial permit applications within the designated corridors, attempting to minimize new fencing designed to exclude wildlife and use of roadway undercrossings and oversized culverts to allow for movement of terrestrial wildlife. Policy **OSRC-7e** would encourage property owners to consult with CDFG and install wildlife friendly fencing in all areas outside urban land use designations. Policy **OSRC-8c(5)** would prohibit new fencing which is designed to exclude wildlife within stream conservation areas of Designated Streams, which is critical to maintaining the function of riparian corridors for terrestrial wildlife movement. Policy **OSRC-7i** would also call for a comprehensive study of habitat fragmentation, connectivity loss, and the effects of exclusionary fencing on wildlife movement. Recommendations for additional policies to protect essential habitat corridors and to improve opportunities for native plant and animal dispersal would be developed as part of Policy **OSRC-7i**, if warranted.

No policies in the *Draft GP 2020* or relevant County ordinances directly address the collective loss of existing natural habitat as a result of future land uses and development. Continued vineyard expansion may result in the loss or conversion of forest, woodland, and riparian habitat. The conversion of timberlands, woodlands, and other habitat to non-timber uses may also take place.

The Vineyard Erosion and Sediment Control Ordinance (VESCO) restricts cultivation on steep slopes and it may have the effect of avoiding some habitat loss. Policy **OSRC-7n** would address the loss of valley oak habitat, typically as a result of proposed urban development, and points out the need to reevaluate current designations and adequacy of mitigation requirements specified by County ordinance. Several County ordinances partially address protection of valley oak and other native or designated trees, but these are limited in their effectiveness.[22] Policy **OSRC-7m** would call for expanding protections for oak woodlands, but would address only one part of the habitat conversion issue. Policy **OSRC-12e** would prohibit the conversion of timberlands for non-timber uses unless they qualify for a timber conversion exemption; they provide an overriding benefit; or they result in no net loss of timberland. The scope of the comprehensive study called for in Policy **OSRC-7i** would eventually identify habitat connectivity needs and measure that would protect corridors for wildlife movement.

In conclusion, proposed policies of the *Draft GP2020* mentioned above pertaining to wildlife habitat and movement opportunities would reduce the impacts of land uses and development on wildlife movement over time. In particular, the study of habitat fragmentation and connectivity loss would provide much information about affected wildlife species and their needs for movement corridors. From this study, potential mechanisms for protection or restoration of corridors could be evaluated.

Until this occurs, these impacts would be significant as rural homes and driveways, urban development, agricultural production, and other uses continue to occur.

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[22] Several County ordinances regulate tree removal. These consist of the following:

(a) Sonoma County Tree Protection Ordinance No. 4044 regulates the removal of certain designated trees, including oaks, madrone, redwood, and California bay. "Protected trees" are defined as trees having a minimum trunk diameter of nine inches measured at 4.5 feet above grade. According to the ordinance, protected trees are to be replaced at a 1:1 ratio or proposed removal is not to exceed 50 percent of the protected trees on a site. Douglas fir is not considered a protected tree species under this ordinance.

(b) Sonoma County Heritage Tree Ordinance No. 3651 provides for the identification and protection of designated heritage trees.

(c) In 1997, regulations also went into effect regarding the protection of valley oaks. These consisted of a General Plan amendment to include new policies to identify and protect valley oaks, a zoning ordinance text amendment establishing the Valley Oak Habitat (VOH) combining district zoning and requiring mitigation where tree removal is proposed, a zoning ordinance map change designating areas with soils which tend to support valley oak, and establishment of general guidelines required in the VOH zoning district. Ordinance No. 4991 provides a definition of "large valley oak" (diameter at breast height greater than 20 inches) and "small valley oak" (diameter at breast height of 20 inches or less), and identifies mitigation options. Mitigation depends on tree size or the cumulative diameter for smaller oaks, and must be implemented within one year of tree removal. Mitigation options include retention of existing trees, replacement plantings, a combination of retention and replacement, or payment of in-lieu fees. The mitigation requirements are not rigorous, ranging from a requirement to retain one or more trees for every one removed, to a 50 dollar in-lieu fee to be used for replacement plants of valley oak by the County. No permit is issued by the County, but a written notice must be filed at least five days prior to tree removal. The Stewardship Guidelines defined in County Resolution No. 96-1624 emphasize the importance of retaining valley oaks to the extent possible and providing valley oak plants as part of landscaping for development projects.

Mitigation Measure 4.6-4 No mitigation available beyond the *Draft GP 2020* policies discussed in the impact analysis above.

Significance After Mitigation Implementation of the *Draft GP 2020* would reduce impacts on wildlife habitat and movement opportunities. However, the cumulative loss and degradation of habitat, fragmentation, and obstruction of movement opportunities would remain a significant unavoidable impact. (**SU**)

Impact 4.6-5 Conflict with Local Policies or Ordinances

*Proposed policies in the Draft GP 2020 that affect biological resources may differ from local policies and ordinances currently in effect. However, potential conflicts would be addressed by the revisions of the implementing ordinances to ensure that they conform to the proposed policies. This would be a less-than-significant impact. (**LTS**)*

The *Draft GP 2020* would update policies regarding biological resources, particularly those related to riparian corridors, wetlands, special-status species, sensitive natural communities, and wildlife movement corridors. Upon adoption of the new policies contained within the *Draft GP 2020*, applicable County ordinances would be updated to conform to the policies so that these conflicts would no longer exist. As a result, this impact would be less-than-significant.

Mitigation Measure 4.6-5 None required.

Impact 4.6-6 Conflict With Adopted Habitat or Natural Community Conservation Plans

*Land uses and development consistent with the Draft GP 2020 would not conflict with any adopted Habitat or Natural Community Conservation Plans. This would be a less-than-significant impact. (**LTS**)*

Land uses and development consistent with the *Draft GP 2020* would not conflict with any adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved conservation plan. No such conservation plans have been adopted encompassing all or portions of Sonoma County, and no impact is therefore anticipated.

Mitigation Measure 4.6-6 None Required.

4.7 GEOLOGY / SOILS

4.7 GEOLOGY / SOILS

Geology / Soils – Environmental Setting [1]

This section presents the geologic and seismic hazards as well as the soil, mineral, and geothermal resources found in Sonoma County. The topics discussed in this section overlap with other sections of this EIR, including the Hydrology and Water Resources, Agricultural Resources, Land Use, and Visual Resources sections. Geology impacts are most closely related to the *Land Use*, *Open Space and Resource Conservation* and the *Public Safety* elements of the *Draft GP 2020.*

REGIONAL GEOLOGY

The topography in Sonoma County is varied, including several mountain ranges, distinctive valleys, and coastal terraces. The geology is quite complex and is continually evolving because of its location at an active plate margin. The county is bounded on the south by the San Pablo Bay and associated wetlands. The Cotati and Petaluma Valleys create the wide basin stretching from Santa Rosa to the Bay. Rolling hills and grasslands predominate here, as well as in Marin County to the south. The rugged Mayacamas and Sonoma Mountains geographically form the eastern boundary and physically separate Sonoma County from Lake and Napa Counties. The Sonoma Valley runs north-south between the Sonoma Mountains on the west and the taller Mayacamas Mountains to the east. The Geysers geothermal field, located in the northeastern section of the county, extends into both Sonoma and Lake Counties. The Mendocino Highlands form a common geographic unit with Mendocino County to the north. The Alexander Valley runs from northwest to southeast, bounded on the east by the Mayacamas Mountains and on the west by the Coast Range. The Pacific Ocean forms the western county boundary, including an interesting assemblage of steep hills, marine terraces, beaches, and off-shore sea stacks.

The geology of Sonoma County is a result of the past tectonic, volcanic, erosion, and sedimentation processes of the California Coast Range geomorphic province. Ongoing tectonic forces resulting from the collision of the North American Plate with the Pacific Plate, combined with more geologically recent volcanic activity, have resulted in mountain building and down warping of parallel valleys. The margin of the two tectonic plates is defined by the San Andreas Fault system: a broad zone of active, dormant, and inactive faults dominated by the San Andreas Fault which trends along the western margin of the county. This fault system results in the northwestern structural alignment that controls the overall orientation of the county's ridges and valleys. The land has been modified by more recent volcanic activity, evidenced by Mount St. Helena that dominates the northeastern part of the county. Erosion, sedimentation, and active faulting occurring in recent times have further modified Sonoma County's landscape to its current form.

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1 The information in this section has been updated from basic geologic setting information previously developed for the *1978 General Plan* and the *1989 General Plan*. These basic information sources are listed in ***Appendix 7.8 Hydrology and Geology Source Information***.

SEISMICITY

Earthquakes are most common along geologic faults that are planes of weakness or fractures along which rocks have been displaced. Faults located within Sonoma County are part of the San Andreas Fault system which extends along most of the length of California and represents the boundary between the Pacific and North American plates of the earth's crust. The faults mapped by the California Division of Mines and Geology are those that show significant surface evidence of lateral or vertical movement in the past two million years (i.e., the Quaternary geologic period) and are defined as active or are considered to be potentially active in the future. [2] Sudden movement or displacement along faults generally causes earthquakes. However, earthquakes are also caused by volcanic activity. Although there are no known active volcanic sources in Sonoma County, the Geysers' Known Geothermal Resource Area (KGRA) is a source of similar seismic events related to movement within deep seated hot or semi molten rock. This area is the source of numerous small seismic events that cluster around the KGRA. These small earthquakes typically range up to Magnitude 3.5 with occasionally larger events. There has been some concern expressed about this the seismic activity since the steam resource has been developed for electrical production. These concerns have been increasingly expressed recently as the schedule for injection of treated wastewater into the deep hot rock source area for enhanced steam production approaches.

Historic Fault Activity

Faults are geologic hazards because of both surface fault displacement and seismic ground shaking that are distinct but related properties. Surface fault displacement results when the fault plane ruptures and that rupture surface extends to, or intersects, the ground surface. Surface fault rupture can be very destructive to structures constructed across active faults. However, the zone of damage is limited to a relatively narrow area along either side of the fault as opposed to seismic ground shaking damage that can be quite widespread.

The only fault in Sonoma County with known surface displacement in historic times is the San Andreas Fault. During the magnitude 8.3 earthquake of 1906, horizontal displacements along this fault averaged 15 feet and surface rupture was mapped along the fault's extent through Sonoma County from the Gualala area to the Bodega Bay area. Lateral displacement was reported to be as much as 12 feet near Fort Ross, and in the Bodega Bay area lateral displacements of up to eight feet with 18 inches of vertical displacement were reported. [3] In addition to the San Andreas Fault, the Healdsburg, Rodgers Creek, and Mayacamas faults all show evidence of surface displacement during the past 11,000 years (i.e., Holocene epoch) but not during the last 200 years. These faults are considered active faults for planning purposes. [4] The Healdsburg fault, which is a northern extension

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2 *Geologic Map of the Santa Rosa Quadrangle, California,* D. L. Wagner, and E. J. Bortungno (compilers), Regional Geologic Map Series, Map 2A, Sheet 1 of 5, scale 1:250,000, California Division of Mines and Geology, 1982

3 The California Earthquake of April 18, 1906, Report of the State Earthquake Investigation Commission, A. C. Lawson, the Carnegie Institution of Washington, 1908, reprinted 1969.

4 *Geologic Map of the Santa Rosa Quadrangle, California,* D. L. Wagner, and E. J. Bortugno, (compilers), Regional Geologic Map Series, Map 2A, Sheet 1 of 5, scale 1:250,000, California Division of Mines and Geology, 1982.

of the Rogers Creek fault, has recently been removed by the State of California from the Alquist-Priolo earthquake fault zoning maps. [5] [6]

Since 1855, more than 140 earthquakes have resulted in property damage in Sonoma County. The 1906 earthquake on the San Andreas Fault had an estimated Richter-scale magnitude of 8.3, the largest seismic event in California in historic times. Effects in Sonoma County included 61 deaths, destruction of most downtown buildings in Santa Rosa, and major damage in Sebastopol, Healdsburg and other communities. [7]

The strongest earthquake since 1906 occurred in 1969 on the Healdsburg fault near Santa Rosa. The *Santa Rosa Earthquakes*, occurring on October 1, 1969, were moderate earthquakes with magnitudes of 5.6 and 5.7 on the southern end of the Healdsburg fault, north of Santa Rosa. These shocks are of special interest for planning in Sonoma County because of the unexpected damage to earthquake-resistant buildings and the concentration of dwelling damage in a relatively small area. The earthquakes were not strong enough to cause building collapse, however, one major brick wall partially fell, other brick walls were cracked or partially failed, hundreds of brick chimneys toppled, and a number of older wood-frame dwellings fell off their foundations or were otherwise seriously damaged. [8] No deaths occurred, but about 15 people were treated in hospitals. Most injuries were lacerations from broken glass. Losses to commercial and public buildings were estimated at two million dollars and losses to dwellings at four million dollars. [9]

Principal damage to non-dwelling construction was primarily in the downtown in older commercial structures. Most damaged structures were brick bearing-wall buildings with sand-lime mortar; none of the damaged brickwork was reinforced. A few older buildings with reinforced concrete walls and wood floors also were damaged. There was significant structural damage to three modern earthquake resistant buildings: the Sonoma County Social Service Building, the Sonoma County Fairground grandstand, and the Crocker-Citizens Bank Building.

Widespread breaks occurred in the eastern part of Santa Rosa in water system pipes, sidewalks, curbs, and street pavements. None of these breaks appears to have resulted from surface fault displacement. Apparently permanent deformation of the underlying alluvium in the form of lurching, or collapse of unconsolidated fill, was responsible. However, the fact that these effects were largely confined to a north-northwest-trending zone two miles long and more or less in line with the fault plane determined for the earthquake suggests that ground motion was especially strong directly over the fault. The most recent significant earthquake in the San Francisco Bay area was the October 1989 Loma Prieta

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5 *Alquist-Priolo Earthquake Fault Zoning Act*, California Civil Code Chapter 7.5, Sections 2621 – 2630, October 25, 2002.

6 *Index to Official Maps of Earthquake Fault Zones*, California Geological Survey, 2002, www.consrv.ca.gov/CGS/rghm/ap/Map_index/index.htm , edited on October 25, 2002.

7 *The California Earthquake of April 18, 1906*, Report of the State Earthquake Investigation Commission, A. C. Lawson, the Carnegie Institution of Washington, 1908, reprinted 1969.

8 *The Santa Rosa, California Earthquakes of October 1, 1969*: *Environmental Science Services Administration and Coast and Geodetic Survey*, K. V. Steinbrugge, et al, 1970.

9 *Geology for Planning in Sonoma County*, Special Report 120, M. E. Huffman, and C. F. Armstrong, California Division of Mines and Geology, 1980.

earthquake of Richter Magnitude 7.1 (Modified Mercalli Intensity VII) centered on a branch of the San Andreas fault zone in the Santa Cruz Mountains over 100 miles southeast of Sonoma County. [10] This earthquake caused substantial damage (i.e., 67 lives lost and approximately seven billion dollars in damage) primarily in the Santa Cruz, San Francisco, and Oakland areas. Most losses were due to seismic ground shaking and associated foundation failures. Although that earthquake caused little or no significant damage in Sonoma County, it was widely felt.

Earthquake Probability

Recent planning studies by the State of California indicate that a similar magnitude earthquake on the Rogers Creek fault in Sonoma County could cause Modified Mercalli Intensity VII damage in this area. [11] The U.S. Geological Survey presents a summary of historic major earthquake activity in the San Francisco Bay area and expected magnitude and probability. [12]

The USGS has conducted extensive research of earthquake probabilities in the San Francisco Bay region. The major causative faults in the region were divided into segments with similar strain characteristics. The strain accumulation rates and the earthquake history on each of the fault segments were then evaluated to estimate the probabilities of future Richter Magnitude 7.0 or larger seismic events during the next 30 years. USGS conclusions about earthquake probabilities for major Bay Area faults are summarized in **Exhibit 4.7-1** and represent a consensus of several leading professionals. [13]

The two most important faults for purposes of planning for seismic impacts in Sonoma County are the San Andreas and Rodgers Creek faults. As shown in **Exhibit 4.7-1**, the present analysis of seismic data indicates that the highest magnitude earthquakes to be expected for the northern San Andreas Fault and the Rodgers Creek faults are 8.0 and 7.5, respectively, on the Richter scale. It has been accepted for many years that earthquakes of magnitude 8.0 or more somewhere on the San Andreas Fault can be expected to reoccur every 50 to 200 years. [14] Recent studies indicate that in Sonoma County an earthquake of approximately 7.0 on the Richter scale on the Rogers Creek fault is estimated to have a 30 year probability of 22 percent. [15] A seismic event equivalent to the strongest ground-shaking in Santa Rosa from the 1969 earthquake can be expected somewhere in Sonoma County once

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[10] The Modified Mercalli Intensity Scale ranges from intensity I to intensity XII and describes effects of earthquakes as opposed to the Richter Scale which measures energy. The effects of a MMI VII earthquake include: All people frightened and run out doors, some people find it difficult to walk, waves on ponds, lakes, etc., caving of sand and gravestream banks, negligible damage to well designed and constructed buildings but poorly built buildings badly damaged, falling plaster and some stucco, numerous broken windows, over turned and damaged heavy furniture.

[11] *Planning Scenario for a Major Earthquake in the Rogers Creek Fault in the Northern San Francisco Bay Area*, Special Publication 112, T. R. Toppozada, et al, California Division of Mines and Geology, 1994.

[12] *Probability of Large Earthquakes in the San Francisco Bay Region, California*, USGS Circular 1053, Working Group on California Earthquake Probabilities, U.S. Geological Survey, 1990.

[13] *Probability of Large Earthquakes in the San Francisco Bay Region, California*, USGS Circular 1053, Working Group on California Earthquake Probabilities, U.S. Geological Survey, 1990.

[14] *Sonoma County General Plan Draft EIR*, 1986.

[15] *Planning Scenario for a Major Earthquake in the Rogers Creek Fault in the Northern San Francisco Bay Area*, Special Publication 112, T. R. Toppozada, et al, California Division of Mines and Geology, 1994.

every 20 to 30 years. This estimate is rough and subject to change as research continues to provide new information. The main point is that the potential impact from damaging earthquakes, especially from ground shaking and secondary effects, needs to be anticipated while planning, locating, and designing new development in Sonoma County.

Exhibit 4.7-1
Summary of Major Earthquake Activity, San Francisco Bay Area Region

Fault	*Historic Magnitude* [a]	*Year of Event*	*Fault Distance / Direction* [b]	*Maximum Credible Earthquake* [c]	*30-Year Probability* [d]
San Andreas	8.2	1906	14.5 SW	8.0	North Coast Segment P = 0.02 M = 8
	7.1	1889			
	7.0	1838			
	6.2	1885			
Hayward	6.8	1868	14 SE	7.0	Northern Segment P = 0.28 M = 7
	6.8	1836			
	6.3	1865			
Rogers Creek	6.7	1898	6 NE	7.5	P = 0.22 M = 7
	5.7 & 5.6	1969			
Green Valley	6.4 & 6.2	1892	23 E	7.0	NE
Concord	5.4	1955	26 SE	7.0	NE
Calaveras	6.6	1911	40 SE	7.0	NE
	6.2	1984 & 1897			
		1979			

a Richter Magnitude.

b From Santa Rosa in miles.

c Moment Magnitude, estimated.

d P = probability in 30 years; M = estimated Richter magnitude of probable 30 year event; NE = not estimated.

Source: *Probability of Large Earthquakes in the San Francisco Bay Region, California,* Circular 1053, Working Group on California Earthquake Probabilities, U.S. Geological Survey, 1990.

Ground Shaking and Liquefaction

Seismic ground-shaking can result in damaging impacts to both close to and at great distances from the source of the earthquake. As evidenced by the numerous structural failures in the Marina District of San Francisco due to the 1989 Loma Prieta earthquake, liquefaction can cause wide spread damage. Seismic ground shaking causes liquefaction by increasing pore water pressure between the sand or silt grains, which temporarily transforms certain water saturated soils to a semi-liquid state. This results in loss of shear strength, thereby removing support from foundations and causing differential settlement, subsidence or total collapse of buildings, bridges, roadways or other structures. The most susceptible areas are the silty "Bay muds" south of Petaluma and Sonoma and near Bodega Bay.

Deposits that are also susceptible to liquefaction are areas underlain by saturated unconsolidated alluvium that has fairly uniform grain size. Thus in alluvial basins within Sonoma County, the potential for liquefaction failures will tend to increase in the winter and spring when the ground water table is higher. These areas include the largest population centers and most intensely developed areas of Sonoma County, as shown on maps prepared by the California Division of Mines and Geology. [16]

Tsunamis and Seiches

Ocean waves generated by certain undersea earthquakes, volcanic eruptions, or landslides are called tsunamis or seismic sea waves. The height and shoreline run up distance of a tsunami are determined by water depth, underwater topography, and shape and orientation of the coastline relative to the tsunami source. The tsunami level expected once in 200 years could affect areas along Sonoma County's Pacific coast up to 20 feet above sea level, with lesser expected run up along the county's San Pablo Bay shoreline. [17] The areas of Sonoma County where tsunami impacts have been predicted in a general and simplified way are shown on the tsunami and seiche maps prepared by the California Division of Mines and Geology. [18] Seismic waves on inland water bodies such as lakes, reservoirs, as well as coastal bays are called seiches. Shoreline areas along Bodega Harbor, Lake Sonoma, and similar enclosed bodies of water in Sonoma County are subject to impacts from seiches.

Earthquake-Induced Landslides

Beyond the immediate area of surface fault rupture, ground deformation can distort the surface, secondary ground cracks can open, and both can damage structures. These kinds of ground failures are caused by the torsion effects on the ground adjacent to the fault trace as blocks of the earth move past each other. Seismic lurching is the movement of a soil or rock mass toward an unsupported free face such as a sea cliff, road cut, or steep natural hillside. These kinds of ground failures are caused by seismic accelerations and are transitional to seismically triggered landslides.

Structural Hazards Due to Earthquakes

The susceptibility of a structure to damage from ground shaking, in addition to being related to structural design and construction quality, is also related to the underlying foundation material. [19] A foundation of rock or very firm material can intensify short-period motions, which affect low-rise buildings more than tall, flexible ones. Such materials transmit a broad range of seismic frequencies. A deep layer of water saturated soft alluvium, which transmits lower frequencies, can cushion low-rise buildings, but it can also accentuate the motion in tall buildings. A building's height and flexibility relate to its natural frequency of vibration, or harmonic. Where this frequency is similar to that of the

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16 *Planning Scenario for a Major Earthquake in the Rogers Creek Fault in the Northern San Francisco Bay Area*, Special Publication 112, T. R. Toppozada, et al, California Division of Mines and Geology, 1994.

17 *Geology for Planning in Sonoma County*, Special Report 120, M. E. Huffman and C. F. Armstrong, California Division of Mines and Geology, 1980.

18 *Geology for Planning in Sonoma County*, Special Report 120, M. E. Huffman and C. F. Armstrong, California Division of Mines and Geology, 1980. Plates 1A and 1B.

19 *Earthquake Planning Scenario for a Magnitude 8.3 Earthquake on the San Andreas Fault in the San Francisco Bay Area*, Special Publication 61, J. F. Davis, et al., California Division of Mines and Geology, 1981.

seismic shaking transmitted to the structure through the earth / bedrock foundation materials the building will be more susceptible to earthquake damage. The amplified motion resulting from softer alluvial soils can also severely damage older masonry buildings.

Other potentially dangerous conditions include, but are not limited to: architectural building features that are not firmly anchored, such as parapets and cornices; roadways, including column and pile bents and abutments for bridges and over-crossings; and aboveground storage tanks and their mounting devices. Such features could be damaged or destroyed during strong or sustained ground shaking. Modern, well-constructed buildings, one or two stories high and of wood-frame construction, are considered to be the most structurally resistant to earthquake damage if constructed after earthquake resistance provisions were included in the building codes in the 1960s. Older masonry buildings without seismic reinforcement (i.e., unreinforced masonry) are the most susceptible to the type of structural failure that causes injury or death. The area over which structural damage can occur is substantial, as evidenced by the major damage in Oakland from the 1989 Loma Prieta earthquake with an epicenter in the Santa Cruz Mountains 27 miles to the south, and the extensive damage in Santa Rosa from the 1906 San Francisco earthquake caused by rupture of the San Andreas fault 23 miles to the west. The structural design, quality of construction, foundation design and construction, soil ground water characteristics, as well as the energy and duration of seismic shaking all contribute to the degree of structural hazard. The California Division of Mines and Geology describes various kinds of structures based on age and their potential for resultant earthquake damage. [20] The kinds of structures and the risk from earthquake damage they pose are described below.

Unreinforced Masonry Buildings

These buildings have the highest risk of damage or collapse in a major earthquake. The seismic strengthening of unreinforced masonry (URM) buildings is a useful risk reduction measure. Buildings retrofitted with reinforcing structural elements have significantly improved resistance to collapse of walls and parapets. However, even with seismic retrofitting the earthquake resistance of such structures is less than that of new construction built to the latest seismic codes. After a major earthquake in Sonoma County it is likely that some retrofitted URMs will collapse and many will be so damaged that it will not be economical or feasible to repair them.

Pre-1940 Wood Frame Houses

Wood frame dwellings built before 1940 or even those built as recently as 1950 have often shifted or fallen from their foundations in earthquakes. This is due to the lack of foundation anchorage or to weak cripple walls connecting the first floor to the foundation. Even some newer wood frame houses have been dislodged from their foundations by seismic shaking due to poor quality construction. In general, this mode of structural failure is typical of houses built prior to 1940.

Pre-1973 Tilt-up Concrete Buildings

These kinds of buildings are common throughout industrial and some commercially zoned areas of Sonoma County. The most common cause of severe damage to pre-1973 tilt-up concrete panel buildings is separation between the concrete tilt-up wall panels and the roof structure. This is caused by inadequate structural connection between the roof and the wall panels. As a result, the wall panels

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[20] *Earthquake Planning Scenario for a Major Earthquake on the Rogers Creek Fault in the San Francisco Bay Area,* Special Publication 112, Toppozada., et al., California Division of Mines and Geology, 1994.

fall outward, leading to collapse of the roof and floors. These buildings are common as warehouses or office buildings in industrial parks and in some commercial developments.

Non-ductile Concrete Frame Buildings

These structures are lightly reinforced concrete framed buildings typically constructed before 1971. This kind of construction was used in industrial, commercial, office and warehouse buildings, as well as for some parking garages. Problems conducive to structural failure during earthquakes in this kind of construction include inadequate reinforcement in the columns, beams, and connection joints. Failure modes include shear and flexural failure of columns and the displacement of joints resulting in the collapse of beams supporting floor and roof structures.

Mobile Homes

Mobile homes that are installed without seismic foundation restraints are very susceptible to earthquake damage. Like pre 1940 wood frame houses seismic accelerations typically knock such mobile homes from their foundations. A survey of damage to mobile homes in San Benito, Santa Clara, and Santa Cruz counties after the 1989 Loma Prieta earthquake found that in 27 mobile home parks, 24 percent (592 out of 2,334) of the mobile homes were dislodged from their foundations and suffered damage.

SLOPE STABILITY AND LANDSLIDING

The most frequent and widespread type of ground failure in Sonoma County is landsliding. In the broadest sense, a landslide is a downward and outward movement of slope forming materials composed of rock, soils, artificial fills, or a combination of these. Because of the highly fractured rock formations, steep topography, long coastline, and the area's seismicity, extensive land areas of the county are subject to this destructive hazard. Virtually all parts of the county except the flat lying alluvial valleys are subject to damaging landslides of various kinds. Landslides vary in size, speed of movement, and mechanism. Many landslides occur as smaller slumps or flows within older larger slide masses, however there have been landslides in the County that were as long as two miles, including the Mill Stream landslide two miles northwest of Mount St. Helena.

The areas most susceptible to landsliding are shown on maps prepared by the California Division of Mines and Geology. [21] Areas prone to landsliding include locations of past landslides in the County and hillsides where clay and silt-rich soils absorb water and loose strength and where rock strata are parallel to surface slopes. [22] In addition, landslides occur where faults have fractured rock and along the base of slopes or cliffs where supporting material has been removed by stream or wave erosion, or human activities. Heavy rainfall, human actions, or earthquakes can trigger landslides. They may take the form of a slow continuous movement such as a slump or may move very rapidly as a semi-liquid mass such as a debris flow or avalanche. During very high rainfall years in the San Francisco Bay

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21 *Geology for Planning in Sonoma County*, Special Report 120, M. E. Huffman and C. F. Armstrong, California Division of Mines and Geology, 1980.

22 An example is the Blucher Valley landslide, which reactivated on March 9, 1998. This slide, which is located on very gentle (10 to 20 degrees) dip slopes of the Wilson Grove Formation, originally moved in 1983.

area, such as the winters of 1968-69, 1972-73, 1981-82, 1985-86, and 1997-98 large numbers of damaging landslides were common in Sonoma County.

Some slides move relatively fast: the Rio Nido slide of February 7, 1998 was a large complex landslide that failed along the Russian River at Canyon Three near Sweetwater Springs Road. The slide started as a rotational failure near the ridge top that split down slope into debris flows affecting houses at the base of two canyons and put approximately 200 people at risk. Like many other slides, this landslide was triggered by the storm of February 1998 and the preceding saturation of the ground. The California Geological Survey has reported nine damaging landslides occurring in Sonoma County in February and March 1998 as a result of that winter's storms. Many of these landslides were the reactivation of pre-existing landslides.

SOIL HAZARDS

Soil characteristics can greatly influence land-use activities. Important soil characteristics include the properties related to agricultural and natural habitat resources, as well as those properties related to land development projects. Site-specific soil properties vary widely throughout Sonoma County and require site-specific investigation to develop a project or implement a land use that will perform properly. Within Sonoma County there are soils with characteristics that include: seasonal shrink and swell (i.e., expansive soils), weak or collapsing soils that compress under a load or when wet, soils that are corrosive to certain materials, soils that may liquefy during seismic shaking, and soils that are susceptible to erosion.

Subsidence and Differential Settlement

Most subsidence is caused by the withdrawal of fluids (e.g., ground water or oil) from subsurface reservoirs or from the collapse of surface and near surface soils and rocks over subterranean voids such as mines and caves. The aerial extent over which subsidence occurs can be very localized, or it can impact large areas such as in California's Central Valley where in the Los Banos / Kettleman City area over 5,000 square kilometers have subsided more than 0.3 meters on the average, with localized areas of up to 8.5 meters of subsidence.[23] The cause of this subsidence was the pumping of ground water from a deep confined aquifer. As the water is removed, fluid pressure is reduced and the pore spaces between the grains in the aquifer collapse. Managing groundwater pumping from basins and recharging the aquifers has proven to be effective in mitigating, and in some cases reversing subsidence due to this cause.

Settlement is a more localized phenomenon and is related to the loading of soils and their subsequent compression as a result of construction activities. Differential settlement results when settlement across an area settles at different rates or in different amounts. Settlement can result if the native soils are porous or weak such that the weight to a building or other structure causes the soil to compress. This can occur in native soils or in manmade fills. The amount of settlement depends on the thickness of the weak compressible soils or fill, the load imposed by the construction, as well as the original density of the soils. Non-uniform or differential settlement can occur if the compressible soil section beneath the structure is variable, if the soil is heterogeneous, or if there are variable loads imposed across the footprint of the structure. If a structure is constructed such that it spans native soil and bedrock or native soil and a section of fill, differential settlements can be expected. In pavement

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23 *Environmental Geology, 3rd Edition*, E. A. Keller, p.123, Charles, E. Miller Publishing, Co., 1981.

sections differential settlement is common when utility trench backfill is improperly compacted. This can happen when the fill is placed by saturation with water (i.e., *jetting*), if the soil is too moist or to dry, or if the lifts are too thick. The kinds of damage cause by settlement and differential settlement are similar to that caused by expansive soil (e.g., tilted and cracked floor slabs, uneven floors in buildings, cracked pavements, etc.).

Expansive and Creeping Soil

Expansive soils, which are found in various parts of Sonoma County, greatly increase in volume when they absorb water and shrink when they dry out. Expansion is most often caused by clay minerals, primarily montmorillonite and illite although some rocks are also expansive including claystones or altered volcanic tuffs that contain large proportions of montmorillonite. Expansive soils are classified as CL or CH soils using the Unified Soil Classification System (USCS), with CH soils being the most highly expansive. Expansion of the soil or rock is due to the attraction and absorption of water into the expansible crystal lattices of the clay minerals. The water may be derived from moisture in the air, or ground water beneath the foundations of buildings. When buildings are placed on expansive soils, foundations may rise each wet season and fall each dry season. Roadways, pavements, and other flat construction are highly susceptible to damage from expansive soils. Movements may vary under different parts of a building with the result that foundations crack, various structural portions of the building are distorted, and doors and windows are warped so that they do not function properly. Where expansive soils are located on hill slopes which are common in parts of Sonoma County, they undergo a process of seasonal down slope movement called “soil creep”. Soil creep forces can be substantial and need to be evaluated to determine their effects on foundation elements, retaining walls and other structures.

Erosion

Erosion is the removal of soil by wind or water under the force of gravity. This process results in sheet and gully erosion of land surfaces, the wind-blown denudation of lands, the erosion of stream courses and banks, and the erosion of coastal cliffs, sand dunes and beach areas. All of these erosion processes occur or can occur in Sonoma County. Erosion is a naturally occurring process but can be exacerbated by man’s activities such as vegetation removal, improper farming practices, and grading for roadways and construction. Extreme cases of erosion can lead to landsliding. Erosion results in the loss of topsoil that may reduce yield of crops or forage and cause sedimentation problems downstream. Sediment can fill reservoirs and stream channels, reducing water quality and storage capacity, as well as damaging wildlife habitats, including fisheries. Erosion is a major contributor to water quality impairment (see ***Section 4.5 Hydrology and Water Resources***).

Erosion hazard is rated from slight to very high, based on the runoff characteristics of the soil and land management practices. The vulnerability of natural soil types to erosion (i.e., erodibility) has been mapped by the U .S. Soil Conservation Service and other soils surveys. The generalized distribution of erosion potential in Sonoma County can be estimated by evaluating the soil characteristics described in the Sonoma County Soils Report. [24] In most landscapes undergoing development, however, the natural erodibility of the soil is far less important in determining the severity of future erosion than is the slope, type and degree of land-modification proposed.

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[24] *Soil Survey, Sonoma County, California*, V. C. Miller, United States Department of Agriculture in cooperation with the University of California Agricultural Experiment Station, first issued May 1972, reviewed and reprinted August 1990.

Areas of particular concern are the Petaluma Valley where soil losses can be as high as 20 tons/acre/year; steep hillsides that are cultivated for wine grapes; and rangelands where overgrazing may occur. Within Sonoma County, the Dry Creek, Gualala River, Russian River, Sulphur Creek, Salmon Creek, and Blucher Creek have accelerated stream bank erosion that directly impacts fish spawning areas through sedimentation. For example, the Gualala River watershed, which is in both Sonoma and Mendocino counties, is an impaired water body due to sedimentation. Sedimentation, as well as an increase in water temperature, has resulted in the decline of the coho salmon and steelhead trout fisheries; elevated water temperatures can result from the loss of streamside vegetation and well as reduced stream flows. The watershed's rugged terrain has relatively erodible soils and the area experiences heavy rainfall. Unstable slopes are present throughout the watershed and timber harvesting activities on these slopes affects slope stability. As noted in the Gualala River Watershed Management Initiative, hillside vineyard development is becoming an increasing threat to water quality as more and more steep land is converted to vineyards. [25]

GEOLOGIC RESOURCES

Some of Sonoma County's geologic formations are suitable for managed development or protection because of their uniqueness or visibility (see ***Section 4.11 Visual Resources***). One geologic resource in Sonoma County is the Geysers' Known Geothermal Resource Area (KGRA). It has been a source of significant electric power production since the 1960's as a result of not only the size of the resource but because the steam is relatively dry and has a low chemical reactivity. The mineral resources of the Russian River are also an important geologic resource that has been developed over the years.

MINERAL RESOURCES

Mineral resources are extremely valuable because of their limited supply and their usefulness in modern construction and industrial processes. Sonoma County has many mineral resources that have been valuable enough to justify commercial extraction and processing. Historic activities, including mercury, chromite, and copper mining, have had long-term impacts on down stream soils and water quality.

Sand, gravel, crushed rock, and building stone are considered the most valuable mineral resources in the county with 3.9 million tons of such materials mined in 2003. Over 97 percent of the production was used for construction projects within the county. [26] Removal of bedrock for building blocks, road base, and fill materials has taken place in many different areas and geologic settings of the county but usually in highland areas with steep terrain. Most of the Russian River and parts of other major streams in the county have been mined for sand and gravel to use in concrete and high-quality base and fill. Recent operations have been located along the middle and upper reaches of the Russian River, either within the channel or on adjacent alluvial terraces, along with operations along the Gualala River and Austin Creek.

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25 *Gualala River Watershed, Watershed Management Initiative*, North Coast Regional Water Quality Control Board.

26 *Mineral Land Classification of Aggregate Materials in Sonoma County*, California, California Department of Conservation, Geologic Survey, 2005.

Because of the differences in original materials and the processes involved, each geologic formation provides different types of useful minerals. Maps on file with the Sonoma County Permit & Resource Management Department shows the location and extent of the mineral resources considered significant by recent studies. [27] All of the existing and potential hard rock, terrace, and in stream source areas are designated in the Aggregate Resources Management Plan. [28] The source areas are indicated on the map as well as all the lands classified as regionally significant by the California Division of Mines and Geology. [29]

Geothermal Resources

Geothermal resources in Sonoma County consist of hot water, steam, and heat found at or below the earth's surface. The Geyser's Known Geothermal Resource Area (KGRA), located in northeastern Sonoma County in the Mayacamas Mountains, is the largest steam-powered geothermal development in the world with a peak of 1,800 megawatts of electricity being generated in 1986. Within the KGRA, designated by the California Energy Commission, generation of electricity is permitted only within the central primary area; the surrounding secondary area is restricted to exploration. The electrical generating capacity is estimated at 2,000-3,000 megawatts but the total extent and productive life of this resource is not yet known. Since the late 1980's steam production has decreased and recent efforts have been made to extend the productive life of the steam fields by deep injection of water into the hot rock heat source.

Geothermal steam power occurs when water deep below the earth's surface is heated by exposure to hot porous rock, and the resulting dry steam is tapped at depth by geothermal wells that pipe the steam directly into steam turbine generators to create electricity. Wells, some greater than two miles deep, have been drilled to tap this natural steam. The geothermal power at the KGRA provides an alternative energy source. Hot water geothermal resources also exist in the Dry Creek Valley, Alexander Valley, and Sonoma Valley, but exploration and use of these resources have been very limited. The Regional Wastewater Project operated by the City of Santa Rosa has recently completed a wastewater disposal system which injects treated water into the steamfield in order to recharge the steamfield and boost energy production.

SOILS

Soil is defined by soil scientists as earth surface material that has been so modified or acted upon by physical, chemical or biological agents that it supports plant life. Engineers and geologists define soil as an earth material that is soft enough that it can be removed without blasting. Characteristics such as depth, compressive strength, density, expansion potential, corrosivity, permeability, ability to hold water, and fertility vary widely from place to place. Soils analysis for planning is performed to determine the suitability of soils for agriculture or other resource uses and to characterize engineering

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27 Nichols • Berman communication with David Schlitgen, County of Sonoma, Permit and Resource Management Department, January 2003.

28 *Sonoma County Aggregate Resources Management Plan and Environmental Impact Report*, E.I.P. & Associates, November 1994.

29 *Special Report 146*, California Division of Mines and Geology, 1983.

properties as they relate to the soils' constraints on development. For planning purposes in Sonoma County, both agricultural resource and engineering properties are discussed.

There are 259 soil types mapped within Sonoma County.[30] To facilitate evaluation of these soils, they are classified into 15 major soil associations, with each soil association typically correlated to a particular geographic area. There are five soil associations found in basins, tidal flats, flood plains, terraces and alluvial fans. The remaining ten soil associations are characteristic of high terraces, foothills, uplands and mountains. ***Appendix 7.9 Soils Association Characteristics*** is a comparison of soil association characteristics. Soils associations are divided into broad groups based upon color and texture. These groups illustrate the general pattern of soil occurrence in Sonoma County; the first group includes soils found primarily in basins, flood plains, terraces and alluvial fans while the second group includes soils found primarily in high terrace, foothill, upland, and mountain areas. The associations provide information for general planning and resource management, but do not provide specific technical data on a particular soil. The Sonoma County Soils Survey contains detailed information on individual soil series. For project planning within the county, site-specific geotechnical or agricultural soil investigations may be required prior to environmental review and design of the project.

Prime Agricultural Soils

The Soil Conservation Service's land capability classification system rates soils by capability classes designated by Roman numerals I to VIII, with Class I soils having the fewest limitations for farming.

Class I and II soils, the best suited for agricultural use, are the most fertile with the best drainage and soil depth. Texture is optimum for root penetration and moisture availability. The Ph factor is medium acid to neutral; slopes range from 0 to 15 percent. These soils are located on alluvial fans, terraces, and edges of basins, and are suitable for all crops including row crops, field, truck and specialty crops, fruit trees, nut trees and vineyards. Shrink-swell and erosion potential are minimal, and they have good septic suitability and good water availability. As a result, there is direct competition between agricultural uses and development interests for land containing these soils particularly in the flat areas near cities and transportation routes.

Class III soils are mostly on low hills and terraces, old flood plains, and valley plains. Fertility is most1y moderate with some low and some high fertility for certain soils. These soils produce forage and field crops, row and truck crops, vineyards, orchards, and specialty crops such as strawberries and cut flowers. Class IV soils have severe limitations that reduce the choice of plants and require careful management if cultivated. There are small patches of these soils throughout the county, mainly interspersed with Class II and III soils. They are found on low foothills, terraces, broad ridge tops, flood plains, rounded hills, and moderately steep hillsides. These soils are good for pasture, grazing, forage, hay, alfalfa, oats, small grains, vineyards, and some types of timber production.

There are no Class V soils in Sonoma County.

Class VI, VII, and VIII soils are mostly on steep slopes, except for the soils that comprise dunes, stream channels, and tidal marshes. These soils are used for pasture and range and support grasses, forbes, shrubs and various trees (e.g., Douglas-fir, tan oak, live oak, madrone, and redwood). Areas in

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[30] *Soil Survey, Sonoma County, California*, V. C. Miller, United States Department of Agriculture in cooperation with the University of California Agricultural Experiment Station, first issued May 1972, reviewed and reprinted August 1990.

Sonoma County with steep slopes typically support substantial growths of trees and shrubs that are important for wildlife habitat. These are also areas of high runoff into their watersheds, so maintenance of vegetation is important for protecting the soils of this terrain. Many recreational uses (e.g., parks, trails, nature preserves, etc.) are located in these soil areas because of their attractive natural attributes.

Soils Suitability Types

Another way to classify soils is by their predominant suitability. There are four general classifications of suitabi1ity: prime agricultural soils, timber soils, range soils, and woodland/wildlife habitat soils. ***Appendix 7.9 Soils Association Characteristics*** shows major uses by soil suitability.

Agricultural Soils

These soils are suitable for cultivation and the production of food and fiber. They possess physical properties that allow the production of high crop yields. Typically these are deep, fertile soils with suitable moisture supply, permeability, drainage, PH, and soil temperature. Generally, prime agricultural soils are those under soil capability classes I and II. However, many other soil classes have proven suitable for agricultural use in Sonoma County.

Timber Soils

More than half of Sonoma County, or about 553,000 acres, are in woodland, with commercial timberlands totaling approximately 292,000 acres. [31] The Sonoma County Soils Report states that in 1952 about 64 percent of the woodland acreage was commercial. However, over the past 50 years the percentage of commercial woodland has steadily declined. This trend is expected to continue. Present zoning shows there are 93,875 acres zoned as timberland in Sonoma County. [32] This comprises about 17 percent of the county's total woodland area. Timber soils are assigned to woodland suitability groups that range in depth from 20 to 60 inches. These soils are subject to high erosion hazards have rapid water runoff, and are easily destroyed unless careful logging practices are enforced. Clear cutting tends to destroy slope stability and increase the potential for landslides, stream bank erosion, and sedimentation of streambeds.

Range Soils

A range is an open region over which livestock may roam and feed. The soils used for grazing in Sonoma County have been grouped into twelve range sites comprising a total of 211,500 acres. Each range site is distinguished from the others by its ability to produce significantly different kinds and amounts of vegetation as well as the management needed to keep the site in good condition. Of the twelve sites, nine exhibit erosion potential and two are subject to land slippage.

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31 *Soil Survey, Sonoma County, California*, V. C. Miller, United States Department of Agriculture in cooperation with the University of California Agricultural Experiment Station, first issued May 1972, reviewed and reprinted August 1990.

32 Nichols • Berman communication with Julie Milankowski, County of Sonoma, PRMD, GIS Services, January, 2003.

Woodland / Wildlife Habitat Soils

These soils are characterized by chaparral and rocky land. They are valuable as wildlife habitat and watershed lands but are not as valuable for resource production. Suitability of the soils for various kinds of wildlife varies according to the depth of the soil, its slope and texture, the stones and rocks present, drainage characteristics, and the water absorption capacity. The eight wildlife soil groups delineate the relative soil suitability for growing plants important for wildlife habitat.

Septic Suitability

These soil limitation categories are designated as low, moderate, or severe. The determinants for this rating are based on slope, soil depth, permeability, depth to seasonal high water table, and whether or not the soil is subject to inundation or ponding. Generally soils such as those with United States Soil Classifications GW, GP, and GM have high transmisivity, while those soils classified as CH have very low transmisivity. Soils with either extreme range of transmisivity are problematic for septic leach fields and special designs or mitigation is needed in such areas. Areas with soils suitable for septic systems are shown the Soil Survey of Sonoma County. [33]

Geology / Soils – Regulatory Setting

COUNTY REGULATIONS

Aggregate Resources Management Plan

The Sonoma County *Aggregate Resources Management Plan* (ARM Plan) currently serves as the regulatory document providing guidelines for sound management of aggregate mining in the county. This plan was first adopted by the County in 1980 and later updated in 1994. A program EIR was certified by the County at that time for addressing potential impacts from mining in the areas subject to the plan. In addition to compliance with the ARM Plan, proposed new gravel operations require County approval of a Mining and Reclamation Plan, and a use permit pursuant to County Zoning Ordinance Article 72.

Sonoma County Zoning Code

Article 72 of the County's Zoning Code, the MR or Mineral Resource Combining District, regulates mining and reclamation of mined lands within the county, consistent with the ARM Plan. Combined with several bases zones, various uses are permitted as a right or subject to a use permit. Incompatible uses and residential uses are restricted. Provisions of this article require the approval by the County of a surface mining use permit and approval of a reclamation plan.

The Zoning Regulations were amended in 1993 to include the Geologic Hazard Area Combining District (G District), the purpose of which is to reduce unnecessary exposure of people and property to risks of damage or injury from earthquakes, landslides, and other geologic hazards.

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[33] *Soil Survey, Sonoma County, California*, V. C. Miller, United States Department of Agriculture in cooperation with the University of California Agricultural Experiment Station, first issued May 1972, reviewed and reprinted August 1990.

The G District has been applied to properties which are located within the Alquist-Priolo Earthquake Fault Zone (maps showing this zone are available at PRMD). All uses permitted within the zoning districts with which the G District is combined are permitted, except that no structure intended for human occupancy or otherwise defined as a project in the Alquist-Priolo Earthquake Fault Zoning Act is permitted to be placed across the trace of an active fault or within 50 feet of the surface trace of any fault. A geologic report is required for development of property within the G District. The report must describe the geologic hazards that exist on or affect the property and include mitigation measures to reduce the exposure of people and property to risks of damage, or injury from these hazards, to acceptable levels.

Unreinforced Masonry Buildings

SB547, approved in 1986, mandates that local jurisdictions identify and mitigate seismic hazards in *unreinforced masonry buildings* (UMBs). Referred to as *potentially hazardous buildings* in the State legislation, UMBs are those buildings constructed prior to the adoption of local building codes requiring earthquake resistant design of buildings and constructed of unreinforced masonry wall construction.

In December 1989, the Sonoma County Building Inspection Department (now a Division of the Permit and Resource Management Department) completed a list of properties in Sonoma County that contained UMBs. The Board of Supervisors adopted Resolution #89-2390 that acknowledged this list of UMBs and the Department notified property owners.

The State Seismic Safety Commission has strongly encouraged proactive mitigation programs beyond the minimum notification mandated by SB547, acknowledging that such programs could have the benefits of preservation of human life; reduced disaster response demand and expense; preservation of the tax base; preservation of building contents, often more valuable than the building; and reduced likelihood of the release of hazardous substances.

The cities of Santa Rosa, Sebastopol, Sonoma, and Petaluma have adopted a seismic hazard mitigation ordinance that requires the strengthening and reinforcing of UMBs. To date, Sonoma County has not adopted an ordinance requiring the seismic retrofit of UMBs.

Sonoma County Building Code

ABAG and the U.S. Geological Survey (USGS) have updated information on the importance of groundshaking intensity as a measure of the effect of an earthquake at a specific location. The regional ABAG report *On Shaky Ground* indicates that the intensity of groundshaking is a more important indicator of earthquake hazard and potential damage than is proximity to a fault or location within an Alquist-Priolo Earthquake Fault Zone. There are two separate but related kinds of earthquake hazard. One is surface fault rupture damage which is localized within relatively close proximity to the active fault. The other is groundshaking, which is significant over a much larger area. [34]

Design engineers for new projects determine the required seismic design standards required under the current California Building Code by calculating the *seismic base shear* for structural components and

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[34] The ABAG report is on file with the PRMD and available online at *www.abag.org*.

the *lateral seismic force* for non-structural components and equipment. PRMD Plan Checking staff review these calculations.

Sonoma County is in Seismic Zone 4, the most seismically active of the four seismic zones in the United States. Type A and B faults occur throughout the county. These conditions in the county increase the seismic coefficient and near-source zones and factors, which increase the seismic base shear and lateral seismic force, which in turn increase the seismic design standards. In addition, for essential service buildings, the *importance factor* is greater than 1.0, which results in a 25 percent increase in the seismic base shear and a 50 percent increase in the lateral seismic force, which in turn increase the seismic design standards for such buildings.

The Sonoma County Building Code (periodically updated to conform to revisions in the California Building code) addresses groundshaking intensity issues as part of the review of structures for seismic safety. The California Building Code is another name for the body of regulations known as the California Code of Regulations (CCR), Title 24, Part 2, which is a portion of the California Building Standards Code (CBSC). [35] Title 24 is assigned to the California Building Standards Commission, which, by law, is responsible for coordinating all building standards. Published by the International Conference of Building Officials, the Uniform Building Code is a widely adopted model building code in the United States. The CBSC incorporates by reference the Uniform Building Code (UBC), with necessary California amendments. About one-third of the text within the California Building Code has been tailored for California earthquake conditions.

Subdivision Ordinance

The Sonoma County Subdivision Ordinance lists standards for approval of subdivision applications. These standards include the requirement for preparation of a geological report where further geological investigation is warranted. The geological report must summarize and illustrate areas where standard foundation and other conventional construction techniques are satisfactory; areas where geologic hazards may exist but which the geologist believes can be mitigated, such as through foundation design; and areas where geologic suitability is uncertain without additional geotechnical and/or subsurface investigation. The Ordinance also outlines requirements for a soil condition report to accompany the tentative map, a preliminary soil report based on test borings or excavations to accompany the final subdivision map, and a soil investigation of each lot in the subdivision. The soil investigation report is to be prepared by a registered civil engineer and to include recommended corrective actions which are likely to prevent structural damage on sites with unstable geologic conditions.

Vineyard Erosion and Sediment Control Ordinance

See discussion of ordinance in ***Section 4.8 Agricultural and Timber Resources***.

STATE AND FEDERAL REGULATIONS

Geothermal

Refer to ***Section 4.12 Energy***, for geothermal regulations.

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35 California Building Standards Code, 1995.

Surface Mining and Reclamation Act

All mining operations in the county and throughout the state are subject to the California Surface Mining and Reclamation Act (SMARA). The purpose of SMARA is to identify and protect areas containing significant mineral resources. In doing so, SMARA: a) regulates surface mining operations to assure that adverse environmental effects are prevented or minimized, b) requires reclamation of mined lands to a usable condition that is readily adaptable to alternative land uses, c) produces and conserves minerals, and considers values relating to recreation, watershed, wildlife, range and forage, and aesthetic enjoyment, and d) eliminates residual hazards to the public health and safety. Mining must comply with SMARA through all phases of a project, including the reclamation process. Refer to *Aggregate Resources Management Plan* under *County Regulations,* above. [36]

Alquist-Priolo Earthquake Fault Zoning Act

The Alquist-Priolo Earthquake Fault Zoning Act (formerly the Alquist-Priolo Special Studies Zone Act), signed into law December 1972, requires the delineation of zones along active faults in California. The purpose of the Alquist-Priolo Act is to regulate development on or near active fault traces to reduce the hazard of fault rupture and to prohibit the location of most structures for human occupancy across these traces. [37] Cities and counties must regulate certain development projects within the zones. Such regulation includes withholding permits until geologic investigations demonstrate that development sites are not threatened by future surface displacement. The Rogers Creek Fault Zone and the San Andreas Fault Zone are the two major fault zones in Sonoma County designated by the Alquist-Priolo Earthquake Fault Zoning Act. Sonoma County implements this requirement through the Geologic Hazard Zoning District provisions as part of the County Zoning Code.

Seismic Hazards Mapping Act

The Seismic Hazards Mapping Act was developed to protect the public from the effects of strong ground shaking, liquefaction, landslides, or other ground failure, and from other hazards caused by earthquakes. This act requires the State Geologist to delineate various seismic hazard zones and requires cities, counties, and other local permitting agencies to regulate certain development projects within these zones. Before a development permit is granted for a site within a seismic hazard zone, a geotechnical investigation of the site must be conducted and appropriate mitigation measures incorporated into the project design. The California Geological Survey (formerly the California Division of Mines and Geology) has not completed preparation of a Preliminary Seismic Hazards Map for Sonoma County and the Santa Rosa Area. The hazards maps will depict areas susceptible to land sliding and liquefaction and be accompanied by a report describing the basis for the maps. The State is developing the seismic hazards maps first in areas with the highest growth. The estimated date for completing seismic hazard zone maps for Sonoma County is approximately 2006. [38]

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36 *General Plan Background Report - Agricultural and Mineral Resources*, City of Healdsburg November 7, 2002.

37 The Alquist Priolo Act defines a "structure for human occupancy" as any structure used or intended for supporting or sheltering any use that has an occupancy rate of more than 2,000 man hours per year.

38 Environmental Geology Services conversation with Chuck Real, Director of Geologic Hazards Mapping Program, California Geological Survey, 2003.

Geology / Soils - Significance Criteria

The geologic analysis uses criteria from the *State CEQA Guidelines.* According to these criteria, the project would have a significant geologic impact if it would:

- Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving:
    - Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault;
    - Strong seismic ground shaking;
    - Seismic-related ground failure, including liquefaction; or
    - Landslides.
- 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;
- Result in substantial soil erosion or the loss of topsoil;
- Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), [39] creating substantial risks to life or property;
- 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;
- Result in the loss of availability of a known mineral resource that would be of value to the region and residents of the state; or
- Result in the loss of availability of a locally important mineral resource recovery site delineated on a local general plan, specific plan, or other land use plan.

[39] Table 18-1-B of the Uniform Building Code (Classification of Expansive Soil) simply states the potential expansion as a function of the expansion index of the soil (an Expansion Index of 1-20 has a Very Low potential expansion, 21-50 has Low, 51-90 has Medium, 91-130 has High, and above 130 has Very High potential expansion). The expansion index normally is not determined until site-specific geological investigations are conducted.

Geology / Soils - Impacts and Mitigation Measures

GEOLOGIC HAZARDS

Impact 4.7-1 Seismic Ground Shaking

*Land uses and development consistent with the Draft GP 2020 would expose people or structures to substantial adverse seismic effects, including the risk of loss, injury, or death involving strong seismic groundshaking. This would be a significant impact. **(S)***

The county has a 70 percent probability of experiencing ground shaking from at least one major earthquake (i.e., Moment Magnitude 6.7 or greater) by 2030.[40] Ground shaking can result in structural failure and collapse or cause nonstructural building elements to fall, presenting a hazard to occupants and damage to contents. Older, unreinforced masonry (URM) buildings and other buildings within the county constructed before 1930 that have not been seismically retrofitted are most subject to structural failure or collapse. URM buildings with seismic structural upgrades should be more resistant to seismic shaking damage. However, even these structurally upgraded URMs, as well as newer buildings, could still experience damage that could present a hazard.

Because of the regional effects of large earthquakes, future land uses and development that occur anywhere within the unincorporated area would be subject to ground shaking during such events. Locations where shaking is expected to be more intense are valley and Bay margin areas. Figures PS-1a through PS-1i in the Public Safety Element of the *Draft GP 2020* illustrate the areas in each of the nine planning areas that are subject to seismic hazards. Examples of areas in each of the nine planning areas where the potential for adverse impacts from seismic ground shaking is expected are those areas depicted on Figures PS-1a through PS-1h in the Public Safety Element as Strong Shaking Severity, Very Strong Shaking Severity, Violent Shaking Severity, and Very Violent Shaking Severity. As can be seen on these maps, the areas with the greatest concentration of development with buildings are the generally flat lying basins and valleys which are underlain by thick, poorly consolidated alluvium, with high ground water in some areas. These are areas of deep, unconsolidated deposits, (e.g., alluvium and bay mud), and thus are subject to higher amplitude, longer duration shaking motions that, among other factors, contribute to structural damage.

However, this greater shaking potential is recognized in the Uniform Building Code (UBC), which provides for more stringent earthquake resistant design parameters for such areas. Thus, while these shaking impacts are potentially more damaging, they also will tend to be reduced in their structural effects due to UBC criteria. Older and poorly constructed buildings in these areas would still be prone to seismic damage.

The *Draft GP 2020* contains many policies and standards in the Public Safety Element, which, if adopted and implemented, would reduce the potential impacts associated with strong seismic ground shaking by encouraging or requiring the use of current seismic data in building location, design, and construction, as described below. These policies are presented below along with a discussion of each policy and how the policy could reduce impacts associated with seismic ground shaking.

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40 Working Group on California Earthquake Probability, 1999.

Policy **PS-1a** would result in the ongoing use of available information on geologic hazards and related risks in the county. Using existing and new geologic hazards information geologic hazards from Sonoma County, the California Geological Survey, the US Geological Survey and other sources would allow identification of known geologic hazards, their geographic extent and probabilities for occurrence. When applied to decision-making for siting of critical or sensitive structures and for building design this policy would help keep the Public Safety Element up-to-date and lessen these geologic hazards.

Policy **PS-1b** would result in the use of studies of geologic hazards prepared during the development process. Ongoing studies of geologic hazards developed in Sonoma County by the California Geological Survey, the US Geological Survey, universities and other sources, such as investigations for specific development projects would provide up-to-date information about geologic hazards impacting the county and allow County planners to incorporate the data into decision making for the siting of critical or sensitive structures. This policy would also reduce this impact by informing County planners of the need for updating building codes, structural design, and inspection requirements. Keeping abreast of the latest knowledge regarding geologic hazards in the Sonoma County, and applying it to the planning process would reduce the impact of seismic ground shaking by alerting developers and County officials of problematic conditions and providing for siting and design mitigations. As with Policy **PS-1a**, this policy would help keep the Public Safety Element up-to-date with regard to new information about the locations and magnitudes of geologic hazards in the county.

Policy **PS-1c** would provide for amendments of the Public Safety Element so that new data that significantly change the hazard assessment of the Public Safety Element can be incorporated. As new information about the geologic hazards impacting Sonoma County are developed though research, public agency investigation, geologic events, and project specific experience, this information would be evaluated by the PRMD relative to the existing policies to determine if policies should be amended. If the new information can significantly change the hazard assessment of seismic ground shaking, then the information would be used as a basis for amending the affected policy or policies. As with the preceding policies, this policy would help keep the Public Safety Element up-to-date with regard to recognition of kinds and locations and magnitudes of geologic hazards.

Policy **PS-1d** would encourage research on geologic hazards, their probabilities and their effects within Sonoma County and thereby help to further assure that the Public Safety Element would remain up-to-date. Encouragement of new research on geologic hazards can be accomplished through a variety of means, including working with public agencies such as the California Geological Survey, the US Geological Survey, and State universities to facilitate investigations and research in Sonoma County. This policy would help reduce the impacts of seismic ground shaking and other geologic hazards by helping to provide the latest geologic information to the County planning officials. In addition this policy would help in public awareness and avoidance of geologic hazards.

Policy **PS-1e** would allow for continued implementation of the "Geologic Hazard Area" combining district. These special districts establish regulations for permissible types of uses and their intensities and appropriate development standards within areas that have known adverse geologic conditions. The use of the "Geologic Hazard Area" combining district would be one of the more effective policies to mitigate the damaging effects of geologic hazards. The establishment of such geologic hazard areas is based on the existing maps of the nine planning areas in Sonoma County that delineate areas subject to seismic hazards (specifically Figures PS-1a through PS-1i in the *Draft GP 2020*). This policy would effectively reduce geologic and soils impacts by providing a mechanism for control of development of properties in areas with potentially high to moderate seismic ground shaking impacts.

Policy **PS-1f** consists of three parts. The first part would require review of geologic reports prior to decisions on projects that would subject property or persons to significant risks. The general areas where these risks are expected are shown on Figures PS-1a through PS-1i of the *Draft GP 2020* and related file maps and source documents. This part of the policy would significantly decrease geologic hazards. A geologic evaluation of a site proposed for development, combined with a site and project specific geotechnical engineering investigation that describes the hazards and includes mitigation measures to reduce risks to acceptable levels would result in project plans and designs that would significantly reduce risk from geologic or soils impacts because site specific conditions would be identified and incorporated into the projects. The policy of reviewing these reports adds a level of quality control to the process that would help further reduce seismic ground shaking impacts.

Secondly, for new projects this policy would require geologic reports to describe the hazards and include measures to reduce risks to acceptable levels. In addition the policy would require, where appropriate, that the project engineer or geologist certify that risks have been reduced to an acceptable level. This would lessen the impact of geologic hazards by requiring the project planners and designers to more clearly identify the level of risk after mitigation and allow permitting agencies to approve or deny the project design based on the regulatory acceptance of that level of mitigation.

Policy **PS-1g** specifies a 50 foot building setback from any fault. Because there are numerous faults in Sonoma County that are inactive and extremely unlikely to reactivate, this policy would limit or prevent development of many properties that would not be expected to experience significant geologic or soils impacts that could not be mitigated to the normal acceptable level through the use of the UBC. To the extent that this policy would limit building in the vicinity of known active faults, it would reduce geologic and soils impacts related to an earthquake on those faults.

Policy **PS-1h** would continue to require the County to adopt revisions to the UBC that would increase resistance of structures to ground shaking and other geologic hazards after approval of those revisions by the International Congress of Building Officials (ICBO) and the State of California. This policy would serve to significantly reduce geologic hazards by using the latest UBC requirements for site investigations, design, and construction.

Policy **PS-1i** would apply to structures that have irregular shape or other factors that prevent adequate determination of seismic load distribution by static analysis. This policy would serve to significantly reduce geologic hazards by requiring a dynamic analysis of structural response to earthquake forces prior to County approval of building permits. This would result in structural design that would best mitigate expected strong seismic shaking forces for projects that include structures with irregular shape or otherwise cannot be adequately designed using static analysis.

Policy **PS-1j** would encourage strong enforcement of State seismic safety requirements for the design and construction of projects subject to State and federal standards. As a result, this policy would help assure that these projects (i.e., bridges, dams, power plants, hospitals and schools) are designed and built to the best legally required standard and thus reduce damage from geologic hazards.

Policy **PS-1k** would apply to roads, public facilities, and other County projects. This policy would help to reduce identified geologic hazards by requiring consideration of those geologic conditions at the planning and design stages of the project.

Policy **PS-1l** would result in the siting of essential service buildings and facilities, and high public occupancy buildings outside those areas subject to Very Violent, Violent or Very Strong ground shaking, where possible. But in cases where it is not feasible to so locate those kinds of projects, the policy would result in their being designed and constructed to the highest feasible safety standard.

Through appropriate siting and design this policy would reduce adverse impacts to essential and high occupancy public buildings.

Policy **PS-1m** would make all maps identifying geologic hazards in Sonoma County readily available to property owners and the public thus reducing the potential for further geologic and soils impacts by providing information during project planning phase for determining the kinds of geologic impacts that would need to be addressed.

PS-1n would require a Strategic Plan for damage assessment and recovery of essential service buildings and facilities, (i.e., especially high public occupancy facilities and facilities where ground shaking would be strongest). This policy would enhance the County's emergency response planning and thus reduce geologic and soils impacts. However, because there is no schedule for development of the Strategic Plan in the policy, it cannot be relied upon to reduce impacts associated with seismic activity in the near future.

Policy **PS-1o** would result in an ordinance requiring the strengthening of unreinforced masonry (URM) buildings, except residential structures, thus reducing property damage and reducing the possibility of injuries and loss of life. Residential structures, however, could be damaged resulting in property damage and possible lost of life.

Although these policies would reduce some of the impacts associated with strong seismic groundshaking, the potential for damage or loss during an earthquake and prior to mitigation would be a significant impact.

Mitigation Measure 4.7-1 Revise Policy **PS-1o** to specifically include all multiple family residential URM structures.

> **Policy PS-1o**: Adopt an ordinance requiring strengthening and / or reinforcement of Unreinforced Masonry Buildings, <u>including multi-family</u>, but not single family residential structures.

Significance After Mitigation Although implementation of Mitigation Measure 4.7-1 would further reduce the impact of seismic ground shaking, it would not be possible to fully mitigate the impact for the more severe seismic events that may occur. For small and moderate seismic events the impact of strong seismic shaking would be generally reduced to less-than-significant levels. However in the case of more severe seismic events such as the maximum credible earthquake, the potential for property damage and bodily injury would remain. Therefore this would be a significant unavoidable impact. (**SU**)

Responsibility for Monitoring The Board of Supervisors would be responsible for adopting the policy proposed in Mitigation Measure 4.7-1 as part of *GP 2020*. PRMD would be responsible for enforcement of UBC requirements and assuring the latest UBC requirements are adopted by the County, keeping abreast of current geologic and seismic research and investigations in the area, reviewing geotechnical and geologic reports and project structural designs, and in general assuring all policies are enforced.

Impact 4.7-2 Seismic Related Ground Failure

Land uses and development consistent with the Draft GP 2020 would expose people or structures to potential substantial adverse seismic effects, including the risk of loss, injury, or death from seismic-related ground failures such as surface fault rupture, lateral spreading, lurching, differential settlement, and flow failures. While the policies included in the Draft GP 2020 would reduce most impacts to an acceptable level, seismic related ground failure impacts related to roads, public facilities, and other County projects would remain significant. ***(S)***

Seismic related ground failures include liquefaction, lateral spreading, ground cracking, lurching, and seismically triggered land sliding. Surface fault rupture is a special kind of seismic related ground failure that is generally localized along the earthquake-producing fault. As noted in *Impact 4.7-1 Seismic Ground Shaking* the county has a 70 percent probability of experiencing at least one major earthquake (i.e., Moment Magnitude 6.7 or greater) by 2030.[41] Major earthquakes can result in various kinds of seismic related ground failures. The type of seismic related ground failure that results depends on numerous factors such as the kind of soil, ground water depth, soil saturation, slope steepness and topography, duration and amplitude of seismic energy at the site, and other factors. Injection of water into the Geysers Steamfield is being considered as a possible factor which may increase the potential for seismic activity.

These kinds of ground failures, like seismic ground shaking in general, can cause damage to infrastructure, damage or collapse of buildings, or cause nonstructural building elements to fall, presenting a hazard to occupants and damage to contents. Because of the regional effects of large earthquakes, future developments that occur in many parts of the unincorporated area would be subject to seismic related ground failure during a major earthquake. Locations where seismic related ground failure is expected to be more intense are valley and Bay margin areas, along costal bluffs and steep stream or riverbanks, in hilly terrain with existing landslides (i.e., active through dormant), and areas underlain by sandy soils with a high water table. Figures PS-1a through PS-1i in the Public Safety Element of the *Draft GP 2020* illustrate that each of the nine planning areas has some areas that are susceptible to seismic related ground failure.

As noted above, seismic related ground failure is a common hazard that cannot be eliminated in seismically active regions such as Sonoma County where there is diverse topography, areas of shallow ground water, and large active faults exist that are capable of producing very strong to violent ground shaking. However, over time engineers and geologists have learned more about the behavior of soils and earth materials during earthquakes in the region. By applying the lessons from past seismic events to the practices of building location and design, practices have improved greatly so that by using the best and most current standards, seismic damage from seismic related ground failure can be reduced to levels that are generally considered acceptable.

The *Draft GP 2020* contains policies in the Public Safety Element that would reduce the potential impacts associated with seismic related ground failure. See *Impact 4.7-1 Seismic Ground Shaking* above for a discussion of Policies **PS-1a** through **PS-1g**, **PS-1k**, and **PS-1m**. As with *Impact 4.7-1 Seismic Ground Shaking*, implementation of these policies would not eliminate the impact for the more severe seismic events that may occur. For small and moderate seismic events the impact of seismic related ground failure would be generally reduced to a less-than-significant level for new development through implementation of the *Draft GP 2020* policies (including enforcement of the

41 Working Group on California Earthquake Probability, 1999.

current UBC), but in the case of more severe seismic events such as the maximum credible earthquake, this would be a significant impact.

Mitigation Measure 4.7-2 No mitigation available beyond the *Draft GP 2020* policies discussed in the impact analysis above.

Significance After Mitigation This would be a significant unavoidable impact. (**SU**)

Impact 4.7-3 Landsliding

*Land uses and development consistent with the Draft GP 2020 would expose people and structures to substantial damaging effects of landsliding, including the risk of loss, injury, or death from down slope earth movement that may be slow or rapidly occurring. This kind of geologic hazard can be caused by earthquake, seasonal saturation of the soils and rock materials, erosion, or grading activities. This would be a significant impact. (**S**)*

The most frequent and widespread type of ground failure in Sonoma County is landsliding. Because of the highly fractured rock formations, steep topography, long coastline, and the area's seismicity and rainfall, extensive land areas of the county are subject to landsliding. Virtually all parts of the county except the flat lying alluvial valleys are subject to damaging landslides of various kinds. Landslides vary in size, speed of movement, and mechanism; some are small slumps or flows within older larger slide masses, while some landslides in the county have been as long as two miles. Areas prone to landsliding include locations of past landslides, hillsides where clay and silt-rich soils absorb water and loose strength, and areas where rock strata are parallel to surface slopes. In addition, landslides occur where faults have fractured rock and along the base of slopes or cliffs where supporting material has been removed by stream or wave erosion, flowing water, or human activities. Heavy rainfall, human actions, or earthquakes can trigger landslides. Locations where landslide failure is expected to be more common are along costal bluffs and steep stream or riverbanks, and in hilly terrain with existing landslides (i.e., active through dormant).

Figures PS-1a through PS-1i in the Public Safety Element of the *Draft GP 2020* show the areas within each of the nine planning areas that are susceptible to landslide failure. Examples of areas in each of the nine planning areas where the potential for adverse impacts from landsliding is expected are those areas on Figures PS-1a through PS-1i designated as high to very high landslide susceptibility.

Landsliding is a widespread impact that cannot be eliminated completely in a geologically complex region such as Sonoma County where there is diverse topography, highly variable seasonal rainfall, and large active faults that can produce very strong to violent ground shaking that can trigger slope failures. However, over time engineers and geologist have learned ever more about the behavior of soils and earth materials under extreme groundwater and rainfall conditions and during earthquakes in the region. In addition, maps of existing landslides and landslide prone regions in the county have been developed. By applying knowledge about the locations of existing landslides and areas with poor slope stability the practices of building location and slope stabilization have improved greatly. By using the best and most current standards, landslide damage can be minimized.

The *Draft GP 2020* contains many policies and standards in the Public Safety Element that, if adopted and implemented, would reduce the potential impacts associated with landsliding. See *Impact 4.7-1 Seismic Ground Shaking*, above for a discussion of Policies **PS-1a** through **PS-1f**, **PS-1k**, and **PS-1m**. For small and moderate seismic events and lower rainfall events the impact of landslide failure would be generally reduced to a less-than-significant level for new development through implementation of the *Draft GP 2020* policies (including enforcement of the current UBC). As with *Impact 4.7-1*

Seismic Ground Shaking, implementation of these policies would not completely eliminate the impact of landsliding events that may occur during maximum rainfall or seismic activity occurrences. In the case of severe seismic events or unusually high rain fall over a short duration, it would not be possible to eliminate the potential impact in some locations. As a result, this would be a significant impact.

Mitigation Measure 4.7-3 No mitigation available beyond the *Draft GP 2020* policies discussed in impact analysis above.

Significance After Mitigation This would be a significant unavoidable impact (**SU**).

Impact 4.7-4 Subsidence and Settlement

Land uses and development consistent with the Draft GP 2020 could expose property and structures to the damaging effects of ground subsidence hazards. This kind of geologic hazard can be seismically triggered (e.g., liquefaction), caused by seasonal saturation of the soils and rock materials, or caused by grading activities. This would be a significant impact. ***(S)***

Subsidence and settlement are localized and site and project specific kinds of geologic hazards. Most subsidence is caused by the withdrawal of fluids (e.g., ground water or oil) from subsurface reservoirs or from the collapse of surface and near surface soils and rocks over subterranean voids such as mines and caves. This type of subsidence has thus far not been reported in Sonoma County. Settlement, a kind of subsidence, is a more localized phenomenon and is related to the loading of soils and their subsequent compression as a result of construction activities. Settlement can result if the native soils are porous or weak such that the weight to a building or other structure causes the soil to compress. This can occur in native soils or in manmade fills. Non-uniform or differential settlement can occur if the compressible soil section beneath the structure is of variable thickness, if the soil is heterogeneous, or if there are variable loads imposed across the footprint of the structure. In pavement sections differential settlement is common when utility trench backfill is improperly compacted. The kinds of damage caused by settlement and differential settlement are similar to that caused by expansive soil (e.g., tilted and cracked floor slabs, uneven floors in buildings, cracked pavements, etc.). As with expansive soils, standard geotechnical engineering procedures and soil testing, proper design and testing, and quality control can identify compressible soil during construction. A special category of settlement is liquefaction. This category of subsidence is triggered by seismic shaking and impacts areas underlain by granular soils that are saturated by groundwater. This impact is related to both seismic shaking (i.e., the triggering mechanism), as well as soil and groundwater conditions. Liquefaction is the transformation of water saturated granular soils from a solid state to a liquid state as a result of an increase in the inter-granular (or pore) water pressure caused by intense ground shaking. The kinds of damage caused by liquefaction include sudden collapse or overturning of structures, collapse of pavements, and in some cases lateral spreading. As with settlements resulting from compressible soils and expansive soils, standard geotechnical engineering procedures and soil testing, proper design and testing, and quality control can identify liquefiable soils during site exploration. By applying knowledge about the kinds of soils, their strengths, the groundwater conditions and properly designing and constructing fills and foundations modern soil engineering practices have improved greatly so that by using the best and most current standards, subsidence and settlement damage can be reduced to levels that are generally considered acceptable. By applying such standards to future projects in the county, the impact of subsidence and settlement failure can be essentially eliminated.

The *Draft GP 2020* contains policies and standards in the Public Safety Element that, if adopted and implemented, would reduce the potential impacts associated with subsidence and settlement. See *Impact 4.7-1 Seismic Ground Shaking*, above for a discussion of Policies **PS-1f**, **PS-1k**, and **PS-1m**.

For small and moderate seismic and rainfall events the impact of settlement would be generally reduced to a less-than-significant level for new development through implementation of the *Draft GP 2020* policies (including enforcement of the current UBC). As with *Impact 4.7-1 Seismic Ground Shaking*, implementation of these policies would not completely eliminate the impact of subsidence settlement that could be expected during maximum rainfall or seismic activity events. In the case of severe seismic events or unusually high rain fall over a short duration the impact would be significant in some locations. These locations are those areas on Figures PS-1a through PS-1I designated as high to very high liquefaction susceptibility.

Mitigation Measure 4.7-4 No mitigation available beyond the *Draft GP 2020* policies discussed in impact analysis above.

Significance After Mitigation This would be a significant unavoidable impact (**SU**).

Impact 4.7-5 Tsunamis and Seiches

*Land uses and development consistent with the Draft GP 2020 could expose people and structures in limited areas of the county to potential, substantial adverse seismically caused flooding and strong tidal effects, including the risk of loss, injury, or death. While the policies included in the Draft GP 2020 would reduce impacts to an acceptable level, tsunami and seiche impacts related to roads, public facilities, and other County projects would be significant. **(S)***

Ocean waves generated by certain undersea earthquakes, volcanic eruptions, or landslides are called tsunamis or seismic sea waves. The height and shoreline run up distance of a tsunami are determined by water depth, underwater topography, and shape and orientation of the coastline relative to the tsunami source. The tsunami level expected once in 200 years could affect areas along Sonoma County's Pacific coast up to 20 feet above sea level, with lesser run up expected along the county's San Pablo Bay shoreline. The areas of Sonoma County subject to tsunamis are identified on published maps by the California Geological Survey (formerly California Division of Mines and Geology) available at the County PRMD offices. These maps are included in the report Geology for Planning, Sonoma County, California. [42] In addition the planning areas where tsunami hazards are expected are along the San Pablo Bay margin and along the Pacific Coast. These areas are coastal areas depicted on Figures PS-1a (Sonoma Coast and Gualala Basin) and the southernmost part of the Sonoma Valley in the Bay wetland area of PS-1h (Petaluma and Environs). Seismic waves on inland water bodies such as lakes, reservoirs, as well as coastal bays are called seiches and can result tin damage to structures along the edges of these water bodies. Shoreline areas along Bodega Harbor, Lake Sonoma, and similar enclosed bodies of water in Sonoma County are subject to impacts from seiches. Tsunamis and seiches impact limited areas of Sonoma County. Their impact can be minimized in Sonoma County by applying the lessons from past seismic events, and by implementing the practices of careful building location, setback, and design.

The locations of the line delineating tsunami run up is presented on the planning maps for the Sonoma Coast / Gualala Basin (Figure PS-1a) and Sonoma Valley (Figure PS-1i) planning areas. For the Sonoma Coast / Gualala Basin area this line basically parallels the coast, but in the vicinity of Jenner it extends up the Russian River approximately one mile, almost to the community of Duncan's Mills.

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42 *Geology for Planning For Planning, Sonoma County, California*, California Division of Mines & Geology Special, Report 120 CDMG, 1980.

For the Sonoma Valley planning area the tsunami run up line extends along the margin of the Bay mud flats within approximately one mile of Sears Point. [43]

The *Draft GP 2020* contains policies in the Public Safety Element that, if adopted and implemented, would reduce the potential impacts associated with tsunamis and seiches. See *Impact 4.7-1 Seismic Ground Shaking*, above for a discussion of Policies **PS-1a** through **PS-1f**, **PS-1k**, and **PS-1m**. As with *Impact 4.7-1 Seismic Ground Shaking*, implementation of these policies would not eliminate the impact for the more severe seismic events that are to be expected. For small and moderate seismic events the impact of tsunamis and seiches would be generally reduced to a less-than-significant level for new development through implementation of the *Draft GP 2020* policies (including enforcement of the current UBC), but in the case of more severe seismic events such as the maximum credible earthquake, the impact would be significant.

Mitigation Measure 4.7-5 No mitigation available beyond the *Draft GP 2020* policies discussed in the impact analysis above.

Significance After Mitigation This would be a significant unavoidable impact. (**SU**)

Impact 4.7-6 Soil Erosion

*Erosion can result in the loss of agricultural soil resources, as well as expose improvements to erosion-related damage such as undermining and settlement, and in severe cases can progress to landsliding. This would be a significant impact. (**S**)*

Soil erosion through sheet flow and channeled runoff causes the wearing down of land surfaces, development of gullies, the erosion of stream courses and banks, and the erosion of coastal cliffs, sand dunes, and beach areas. Wind erosion is another mechanism for denudation of lands. Causes include vegetation removal, improper farming practices, and grading for roadways and construction, improper diversion and discharge of water. Extreme cases of erosion can lead to landsliding. Erosion results in the loss of topsoil that may reduce yield of crops or forage and cause sedimentation problems downstream.

Erosion is a wide spread impact that cannot be eliminated in areas of moderate to steep topography in the San Francisco Bay Area and Sonoma County where development takes place. However, over time engineers and geologists have developed practical and effective approaches to control and minimize soil erosion in the region due to both agricultural and non-agricultural development. By applying modern erosion control practices to building location and design, and to agricultural development management of soil erosion losses have improved greatly so that they can be reduced to levels that are generally considered acceptable.

The *Draft GP 2020* contains policies and standards in the Public Safety Element that, if adopted and implemented, would reduce the potential impacts associated with erosion. See *Impact 4.7-1 Seismic Ground Shaking*, above for a discussion of Policies **PS-1a** through **PS-1c**, **PS-1e**, **PS-1f**, and **PS-1k**. For lower rainfall rates the impact of erosion would be generally reduced to a less-than-significant level for new development through the implementation of the *Draft GP 2020* policies (including enforcement of the current UBC). As with *Impact 4.7-1 Seismic Ground Shaking* though,

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43 These areas of tsunami run up are more easily viewed on the source maps, California Division of Mines & Geology, Special Report 120, *Geology for Planning in Sonoma County*, 1980, available at PRMD offices in Santa Rosa.

implementation of these policies could not completely eliminate the impact of erosion during the more severe maximum rainfall events. In the case of unusually high rain fall over a short duration the impact would remain in some locations. Therefore, this would be a significant impact.

Mitigation Measure 4.7-6 No mitigation available beyond the *Draft GP 2020* policies discussed in the impact analysis above.

Significance After Mitigation This would be a significant unavoidable impact. **(SU)**

Impact 4.7-7 Expansive Soils

Land uses and development consistent with the Draft GP 2020 could expose property improvements to potential adverse effects from expansive soils. Expansive soils can cause damage to improvements, especially structures such as residential buildings, small commercial buildings and pavements. This would be a less-than-significant impact. ***(LTS)***

Expansive soils contain clay minerals that greatly increase in volume when they absorb water and shrink when they dry. When light buildings such as houses and light commercial buildings are placed on expansive soils, foundations may rise each wet season and fall each dry season. Roadways, pavements, and other flat construction are also highly susceptible to damage from expansive soils. Movements may cause foundations to crack, various structural portions of the building to be distorted, and doors and windows to warp so that they do not function properly.

The adverse effects of expansive soils can be avoided through proper subsoil preparation, drainage, and foundation design. In order to design an adequate foundation, however, the condition must be recognized through appropriate soil sampling and laboratory soils testing. Expansive soils are identified through expansion tests of samples of soil or rock, or by means of the interpretation of Atterberg limit tests, a standard soils testing procedure. Procedures employed in expansive soils testing are found in many codes and regulations; Chapter 70 of the Uniform Building Code requires such soils testing.

The *Draft GP 2020* contains policies and standards in the Public Safety Element that, if adopted and implemented, would reduce the potential impacts associated with expansive soils. See *Impact 4.7-1 Seismic Ground Shaking*, above for a discussion of Policies **PS-1a** through **PS-1c**, **PS-1e**, **PS-1f**, and **PS-1k**. For new development the impact of expansive soils would be reduced to less-than-significant levels through the implementation of the *Draft GP 2020* policies (including enforcement of the current UBC).

Mitigation Measure 4.7-7 None required.

Impact 4.7-8 Septic Suitability of Soils

The construction of septic tanks or alternative wastewater disposal systems on soils incapable of adequately supporting such systems can cause damage to improvements and can adversely impact surface and ground water resources. Policies and programs contained in the Draft GP 2020 would reduce such impacts to a less-than-significant level. ***(LTS)***

Soils with limitation on their suitability for septic systems are described by categories designated as low, moderate, or severe. The determinants for this rating are based on slope, soil depth, permeability, depth to seasonal high water table, and whether or not the soil is subject to inundation or ponding. Generally soils such as those with USCS Classifications GW, GP, and GM have high transmisivity and those soils classified as CH have very low transmisivity. Soils with either extreme range of

transmisivity are problematic for septic leach fields and special designs or mitigation is needed in such areas.

The adverse effects of the impacts associated with septic suitability of soils can be avoided through proper in-situ soil percolation testing and septic system design, careful construction monitoring, as well as post construction system monitoring and maintenance. In order to design an adequate septic system, however, the site conditions must be recognized through appropriate field-testing during specified times of the year, as required by the PRMD. Procedures employed in soils testing and percolation testing are found in the present County regulations. By applying appropriate field testing and using current practices for septic system location and design, construction monitoring and post construction monitoring and maintenance, adverse impacts due to septic suitability of soils can be reduced to levels that are acceptable.

The *Draft GP 2020* contains many policies and standards in the Public Safety Element that would reduce the potential impacts associated with the septic suitability of soils. See *Impact 4.7-1 Seismic Ground Shaking*, above for a discussion of Policies **PS-1a** through **PS-1c**, and **PS-1m**. For new development the impact of the septic suitability of soils would generally be reduced to less-than-significant levels through the implementation of the *Draft GP 2020* policies (including enforcement of the current UBC).

For the purposes of this analysis, the impact is considered to be reduced to a less-than-significant level if all currently available geotechnical engineering and construction practices are implemented. By applying such standards to future projects in the county, the impact of septic suitability of soils can be essentially eliminated. Because the policies discussed above would considerably reduce potential septic suitability of soils impacts, this would be a less-than-significant impact.

Mitigation Measure 4.7-8 None required.

MINERAL RESOURCES

Impact 4.7-9 Mineral Resources

*Land uses and development consistent with the Draft GP 2020 could result in the loss of the availability of a known mineral resource. This would be a less-than-significant impact. (**LTS**)*

A policy that results in the loss of availability of a known mineral resource that would be of value to the region and residents of the state, or that results in the loss of availability of a locally important mineral resource recovery site delineated on a local general plan, specific plan, or other land use plan would be considered to be a policy with a significant impact according to the significance criteria.

In Sonoma County sand, gravel, crushed rock, and building stone are considered the most valuable mineral resources, which are actively mined in a number of areas of the county. Mining of these materials has taken place in many different geologic settings of the County including highland areas with steep terrain, the Russian River, and parts of other major streams. Recent aggregate mining has been located along the middle and upper reaches of the Russian River, within the channel and on adjacent alluvial terraces. Presently approximately 50 percent of the high quality alluvial aggregates are being quarried from terrace deposits. Terrace mining of aggregates is currently being phased out, while at the same time, in-stream operations are limited by regulations of the depth of skimming and by recent listings of endangered species.

Mining activities would continue with the *Draft GP 2020*. Mineral resources are discussed in the Open Space and Resource Conservation Element of the *Draft GP 2020*. This element builds on the County's *Aggregate Resources Management Plan* (ARM Plan). [44] Policy **OSRC-13a** is to consider land designated in the ARM Plan as priority sites for aggregate production and mineral extraction and to review requests for additional designations for conformity with the *GP 2020* and the ARM Plan. Policy **OSRC-13b** directs the County when approving mining permits to review the individual projects for environmental impacts and land use conflicts. In order to avoid incompatible land uses adjacent to potential mineral resource exaction areas Policy **OSRC-13c** requires the review of projects which are on or near sites designated Mineral Resources in the ARM Plan for compatibility with future mineral extraction.

Implementation of the *Draft GP 2020* policies would avoid significant impacts from the loss of availability of potentially valuable mineral resources.

Mitigation Measure 4.7-9 None required.

44 *Sonoma County Aggregate Resources Management Plan and Environmental Impact report*, EIP & Associates, November 1994.

4.8 AGRICULTURAL AND TIMBER RESOURCES

4.8 AGRICULTURAL AND TIMBER RESOURCES

Agriculture – Environmental Setting

This section addresses the recent history and present state of agriculture and timber production in Sonoma County. Specific topics include conversions of agricultural and forest land; agricultural processing and the viability of vineyards, dairies, and other Sonoma agricultural production, and agricultural tourism issues resulting from wineries and special events. Current County, State, and federal regulatory oversight are explained. Some topics discussed in this section overlap with other sections of this EIR, including Sections ***4.1 Land Use, Population, and Housing***; ***4.5 Hydrology and Water Resources***; ***4.7 Geology / Soils***; and ***4.11 Visual Resources***. Agriculture impacts are most closely related to the *Draft GP 2020* Land Use and Agricultural Resources Elements.

AGRICULTURAL PRODUCTION

Sonoma County remains one of the most productive farm counties, ranking 16th in California and 34th in the nation. It is the specialty food basket of the Bay Area, with farms and ranches producing a variety of crops and products. Some types of farms cover thousands of acres, such as dairy farms, vineyards, and apple orchards, while specialty crops like organic vegetables, peaches, blueberries, olives, and kiwi are grown on small-scale farms ranging from five to 20 acres. Except for vineyards, other agricultural commodities generally do not generate sufficient profit to justify agricultural land prices in the county. Local farmers have to rely more on specialty niche markets and creative marketing to be competitive. [1]

Sonoma County's agricultural history is based on soil types and a climate that has fostered a diversity of farm based production. Over the years the most valuable crop produced in the county has shifted several times: In the beginning of the last century, apples dominated the market, followed by a shift to poultry in the late 1920's, dairy products in the mid 1950's, and wine grapes in the late 1980's. [2] There are remnants of the great diversity of the early part of the last century: apples and prunes are only shadows of their peak importance; dairy farms are still present, although greatly reduced in number; growing vegetables has increased, with particular value in organic vegetables; the nursery industry has grown to supply the demand for varietal wine grape rootstock and other plants; and the livestock industry still has value, but greatly reduced are the number of egg ranches and sheep herds. Urbanization and changing economic conditions have also taken their toll. [3]

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1 *Sonoma County agriculture digs in during tough time – farms, ranches confront sluggish economy, increasing regulations*, Tim Tesconi, Press Democrat, June 4, 2003.

2 *Sonoma County Agricultural Crop Report—1999,* prepared by the Office of the Agricultural Commissioner, Sonoma County, California, April 2000.

3 *Looking Back to the Future – the Last 100 Years in Sonoma County Agriculture,* Sonoma County Agricultural Commissioners, http://www.sonoma-county.org/agcomm/agcomm_division/soco_ag_99.htm, July 2003.

Exhibit 4.8-1 shows the relative production value of the major commodities in Sonoma County from 1985 to 2000. Wine grapes now account for 65 percent of the total farm income (approximately $389,855,000). Because they are among the best grapes in the world, vineyards have replaced prune orchards, vegetable farms, and cow pastures. [4] Milk is the second leading commodity, valued at about $90 million, or 15 percent of the total Sonoma County farm income. While production value for wine grapes has steadily increased, with an increase of 322 percent from 1985 to 2000, the value of milk (included in the category of *Livestock and Poultry Products)* has steadily declined 26 percent during the same period. In fact, with the exception of wine grapes and nursery production, all other categories have declined over the past 15 years in production value. Other major agricultural industries are poultry and eggs (included in the category *Livestock Production*), which comprise nine percent; nursery production (which includes grapevines), which is almost six percent, with other fruits and nuts, vegetable crops, and field crops each comprising about one percent of the total. Organic farming production value is growing statewide and in the county. The county agricultural sector has become more reliant on the predominant wine industry.

Timber production value has increased 287 percent since 1985; it comprises about three percent of the total agricultural and timber production value.

Exhibit 4.8-1
Sonoma County Total Timber and Agricultural Production Value (2000 Dollars)

Commodity	*1985 (Dollars)*	*1991 (Dollars)*	*1995 (Dollars)*	*2000 (Dollars)*	*Percent of Total (2000)*	*Net Change (1985-2000)*	*Percent Change (1985-2000)*
Timber	5,036,880	10,396,830	13,116,984	19,493,979	3.2	14,457,099	287.0
Fruits/Nuts (less wine grapes)	18,182,851	13,464,978	6,655,349	3,520,000	0.6	14,662,851	-80.6
Wine Grapes	92,342,717	186,869,746	179,459,518	389,853,900	64.4	297,511,183	322.2
Livestock Production	62,699,977	45,572,566	42,131,713	54,194,600	9.0	8,505,377	-13.6
Livestock and Poultry Products	121,931,726	100,619,039	93,901,541	90,818,300	15.0	31,113,426	-25.5
Nursery Production	18,795,083	38,731,472	35,022,587	33,270,400	5.5	14,475,317	77.0
Vegetable Crops	9,528,037	12,001,784	19,459,052	6,640,600	1.1	2,887,437	-30.3
Field Crops	14,958,481	12,911,966	10,314,938	7,178,400	1.2	7,780,081	-52.0
Total	***343,475,752***	***420,568,381***	***400,061,682***	***604,970,179***	***100.0***	***261,494,427***	***76.1***

Source: *Economics Discussion Paper: Agricultural Processing,* Economic & Planning Systems, Inc, June 12, 2002.

Soils

Agricultural soils are typically deep, fertile soils with good drainage and minimal shrink-swell and erosion potential. Timber soils tend to be acidic, free of harmful salts, low in fertility, high in permeability, and well-drained. Generally, prime agricultural soils are those under Soil Capability Classes I and II. The factors that contribute to quality agricultural lands are quite similar to those

[4] *Sonoma County agriculture digs in during tough time – farms, ranches confront sluggish economy, increasing regulations*, Tim Tesconi, Press Democrat, June 4, 2003.

desired for development interests. As a result there is frequently direct competition between agricultural uses and development interests, particularly on soils in Capability Class I. Soils are discussed in further detail in ***Section 4.7 Geology / Soils.***

Farmland Classification and Farmland Conversion

As of 2002, Sonoma County had approximately 583,274 acres of agricultural land (57 percent of the county), as determined by the State. [5] Of that total, 421,126 acres (41 percent) were designated as *grazing land* and 162,148 acres (about 16 percent of the county) were classified as *important farmlands* (using California Department of Conservation [CDC] definitions). Grazing land represents land where existing vegetation is suitable for grazing or browsing, whether grown naturally or through management. Important farmland categories represent the agricultural lands most suitable for cultivating crops, and include Prime Farmland, Farmland of Statewide Importance, Unique Farmland, and Farmland of Local Importance, as described below. These four types of important farmland, plus grazing land, constitute the agricultural lands mapped by the State.

- *Prime Farmland* – Lands with the best combination of physical and chemical features able to sustain long term production of agricultural crops. The land must be cropped and be supported by a developed irrigation water supply that is dependable and of adequate quality during the growing season. Land must have been used for production of irrigated crops at some time during the two update cycles prior to the mapping date.

- *Farmland of Statewide Importance* – Lands similar to Prime Farmland but with minor shortcomings, such as greater slopes or less ability to store soil moisture. These lands have the same reliable source of adequate quality irrigation water available during the growing season. Land must have been used for production of irrigated crops at some time during the two update cycles prior to the mapping date.

- *Unique* Farmland – Less quality soils used for production of the State's leading agricultural crops. These lands are usually irrigated, but may include non-irrigated orchards or vineyards as found in some climatic zones of California. Land must have been cropped at some time during the two update cycles prior to the mapping date.

- *Farmland of Local Importance* – Land of importance to the local agricultural economy as determined by each county's board of supervisors and local advisory committees. In Sonoma County, these farmlands include the hay producing areas of the Santa Rosa Plains, Petaluma Valley, and Tubbs Island Naval Reservation. Additional areas also include those lands which are classified as having the capability for producing locally important crops such as grapes, corn, etc., but may not be planted at the present time.

- *Grazing Land* – Lands of at least 40 acres on which the existing vegetation is suited to the grazing of livestock.

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5 *California Farmland Conversion Report–2000 - 2002*, prepared by the staff of the Farmland Mapping and Monitoring Program, California Department of Conservation, 2004. These maps depict actual conditions; they are updated every two years, using a computer mapping system, aerial photos, public review, and field reconnaissance. They do not reflect land use plan designations.

- *Urban and Built-Up Land* – Land occupied by structures with a building density of at least one unit to 1.5 acres, or approximately six structures to a ten-acre parcel.

- *Other Land* – Lands that do not meet the criteria of any other category.

The county's supply of agricultural land, while increasing in several categories, has experienced a net decrease since 1992. As shown in **Exhibit 4.8-2**, between 1992 and 2002 the amount of Prime Farmland, Farmland of Statewide Importance and Unique Farmland increased (gain of 16,349 acres), while the amount of Farmland of Local Importance decreased (loss of 22,812 acres) for a net loss of 6,463 acres of Important Farmland. [6] Part of this change is due to adjustments by the CDC to boundaries and corrections made to soil unit identification throughout the county. The primary reason for the increase in the amount of farmland is due to vineyard additions. The loss of Grazing Land (21,258 acres between 1992 and 2002) was primarily due to a reclassification of lands that were developed in previous years. [7] Neither the adjustments and corrections, nor the reclassification, was the result of farmland conversion during this period. As a result, it is likely that these data actually indicate a net increase in agricultural land.

Exhibit 4.8-2
Farmland Conversion

CDC Farmland Classification	*1992 (acres)*	*1994 (acres)*	*1996 (acres)*	*1998 (acres)*	*2000 (acres)*	*2002 (acres)*	*Net Change 1992-2002 (acres)*
Prime Farmland	34,000	34,248	34,269	35,689	37,035	36,377	2,377
Farmland of Statewide importance	15,145	15,549	15,684	16,790	18,921	19,747	4,602
Unique Farmland	21,803	22,087	22,163	25,052	30,289	31,173	9,370
Farmland of Local Importance	97,663	96,856	96,993	92,867	87,661	74,851	-22,812
Important Farmland Total	***168,611***	***168,740***	***169,109***	***170,398***	***173,906***	***162,148***	***-6,463***
Grazing Land	442,384	442,335	441,852	438,637	432,724	421,126	-21,258
Agricultural Land Total	***610,995***	***611,075***	***610,961***	***609,035***	***606,630***	***583,724***	***-27,271***

Source: California Farmland Conversion Reports 1992 through 2002, California Department of Conservation

Farm Sizes

Land for farming and ranching must be preserved in parcels sizes that are economically viable. In 1997, there were 2,745 farms in the county, averaging 208 acres per farm. Almost 57 percent of the county's land area, or 570,804 acres were considered farms. Farm sizes vary: according to the United States Department of Agriculture, a farm is any place from which $1,000 or more of agricultural products were sold, or normally would have been sold, during the census year. Smaller farms on parcels ranging from two to ten acres are making an increasingly important contribution to agriculture. The growth in demand for vegetables and other crops, including organic produce, contributes to this

6 *California Farmland Conversion Reports*, California Department of Conservation, 1992 through 2002.

7 *Farmland Conversion Reports*, California Department of Conservation, 2000 through 2002. While some of the low density uses on these lands were new, a significant portion had been developed in previous years and is now visible using high resolution digital photography.

trend. [8] Ranches that raise cattle and sheep range are much larger. Most county vineyards are small and privately owned many by family corporations. Forty percent of the Sonoma County Grape Growers Association members have vineyards less than 20 acres, and 80 percent have vineyards less than 100 acres. Grape production is one of a few crops to provide sufficient revenues to support small farm operations. [9]

Organic Agriculture

Organic agricultural production has declined in Sonoma County over the last decade. While in 1993 there were 475 organic producers farming 3,541 acres, there were 247 individual organic registrants in 2002, farming 2,631 acres. The number of producers, which peaked in 1994 at 545, however, has been steadily increasing since the low of 1998 (167 producers) to the current figure of 247. [10] The County Economic Development Board and Agricultural Commissioner's Office promote an awareness of Sonoma County agricultural products that are produced and / or processed using sustainable organic practices.

Vineyards

Sonoma County has a strong history of wine production and wine grapes have been one of the county's leading commodities over the past century. Since the late 1980's, wine grapes have been listed as the most valuable crop. In the 1990's the number of new vineyards and wineries increased, existing vineyards and wineries expanded, and the capacity and size of the wineries grew. It is estimated that acreage increased 77 percent from 1988 to 2000, with an estimated annual growth rate of almost five percent and 2,000 average new acres for the same time period. In 2001, nearly 174,000 tons of grapes valued at $374 million were produced on about 44,000 acres of bearing vineyards with about 14,500 acres of non-bearing land (for a total of approximately 58,500 acres, or six percent of county land area). Wine grapes comprised 64 percent of the Sonoma County total agricultural production value. [11] There were an estimated 191 bonded wineries in 2000, up from 58 in 1969. In the same year, there were 794 growers. [12]

As shown in **Exhibit 4.8-3**, there were a little over 30,000 acres of grapes grown in Sonoma County when the existing *General Plan* was adopted in 1989. As of 2001 that acreage has reached approximately 58,500 acres. [13]

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8 *Rural Residential Lands as Agriculture, CAC memo,* Greg Carr, PRMD, September 19, 2002.

9 Sonoma County Grape Growers Association, http://www.sgcca.org, August 2003.

10 *Sonoma County Agricultural Crop Report-2002,* prepared by the Office of the Agricultural Commissioner, Sonoma County, California, April 2003.

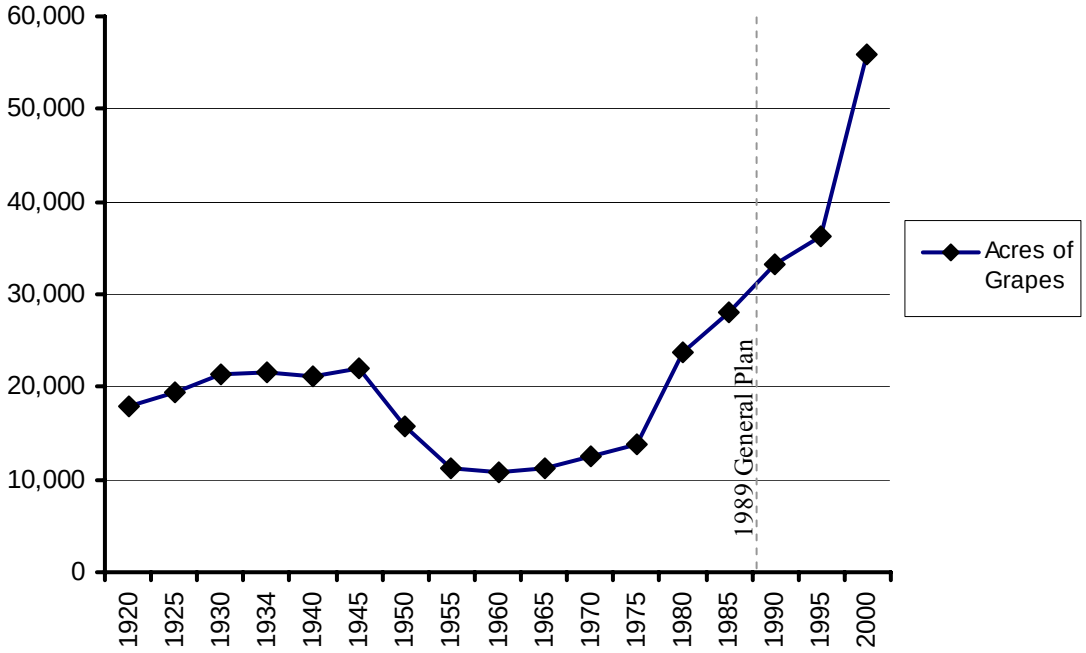
11 *Economics Discussion Paper: Agricultural Processing,* Economic & Planning Systems, Inc., June 2002.

12 *Sonoma County's Wine History,* Sonoma County Grape Growers Association, http://www.sonomagrapevine.org/, 2003.

13 *Winegrape Facts; Grape Production and Values, Sonoma County*, Sonoma County Grape Growers Association. March 24, 2003.

The county's wine industry is currently moving into the third year of a down cycle, with analysts predicting the industry has hit bottom and is slowly moving toward recovery. The industry is well-known for its business cycles, with boom periods lasting about a decade and bust cycles lasting about four years. In particular, pinot noir and cabernet sauvignon grapes account for much of the 15,000 acres of vineyards that will be coming into production in 2003 and 2004. [14]

Exhibit 4.8-3
Acreage of Grapes (Including Non-Bearing) in Sonoma County, 1920-2000



Source: *Winegrape Facts; Grape Production and Values, Sonoma County*, Sonoma County Grape Growers Association. March 24, 2003.

Dairies

The dairy industry in Sonoma County is following statewide trends: California has become the nation's top dairy state, with more cows concentrated on fewer farms. [15] Marin and Sonoma counties contain an important concentration of smaller dairies in the state, with about 80 [16] dairies in Sonoma County and 40 in Marin County (as of 2001). The average dairy has 330 milk cows, with the largest at

14 *Wine industry inching toward recovery,* Tim Tesconi, Press Democrat, June 8, 2003.

15 *California Farm Employers: 25 Years Later,* Don Villarejo, Ph.D., http://www.usdavis.edu, August 2003.

16 *Sonoma County agriculture digs in during tough time*, Tim Tesconi, Press Democrat, June 4, 2003.

1,100 milk cows and the smallest at 110 milk cows. [17] The dairy industry has been challenged by increased costs, including those for water quality and manure management requirements. [18]

In addition to increased production costs, Sonoma County dairy farmers are struggling for financial survival as a nationwide milk surplus pushes producer prices to the lowest levels in 30 years. Some dairy farmers are making value-added products like cheese and others are making the transition to organic milk, which brings a premium price. [19]

AGRICULTURAL PROCESSING [20]

The relationship between production and processing has become increasingly important as consumer demands for fresher, more convenient, and specialized products have increased. These products include certified organic food and dairy items, fresher packaged foods, and frozen meals. Many growers and distributors are trying to move away from commodity-only sales toward value-added products that bundle commodities and services.

Agricultural processing in Sonoma County utilizes both local and imported crops. The predominant segment of local crop processing is the wine industry, though imported grapes are also processed locally. The County currently allows agricultural processing to be located on agricultural lands when related to the primary agricultural activity in the area. Current practice generally interprets this policy to mean that at least 50 percent of the product should come from Sonoma County. Industry representatives are in favor of this policy because it affords flexibility regarding the source of grapes during different economic cycles. According to an assessment by County staff, the importation of grapes for processing in Sonoma County is estimated to be about half of the existing production capacity of Sonoma County wineries. This would be consistent with the existing policy. The majority of the imported grapes may be attributed to the comparatively small number of the larger wineries in the county that produce some wines with the *California* designation. Sonoma County grapes are also exported to other producers outside the county, including Napa County, where they are blended with local grapes or used for Sonoma County appellation bottlings. Smaller wineries tend to produce and market their wines with the federal labeling requirements for *Sonoma County*, *Sonoma County appellation*, and / or *Sonoma County Estate* wines that would preclude using grapes not grown locally.

Agricultural specialization and growth in the local food processing industry indicates that there are a number of opportunities for new directions in Sonoma County agricultural production. Food processing, with the growth of organic and natural food products as an important component, has made important strides in recent years. National trends show that organic farming has been one of the

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17 *Frequently Asked Questions*, University of California Cooperative Extension, Dairy Science, http://cesonoma.ucdavis.edu.DAIRY/faq.htm, August 2003.

18 *Looking Back to the Future – the Last 100 Years in Sonoma County Agriculture,* http://www.sonoma-county.org/agcomm/agcomm_division/soco_ag_99.htm, July 2003.

19 *Sonoma County agriculture digs in during tough time,* Tim Tesconi, Press Democrat, June 4, 2003.

20 The information in this section is based upon:
Agricultural Processing and Support Services, CAC memo, Greg Carr, PRMD, February 20, 2003; and *Economics Discussion Paper: Agricultural Processing*, Economic & Planning Systems, Inc, June 2002.

fastest-growing segments of U.S. agriculture during the 1990s. Also, nationally-certified organic cropland more than doubled during the 1990's, while organic production of eggs and dairy grew even more rapidly. These national trends show the opportunities for growth in these sectors locally. [21]

Food processing is an emerging sector in Sonoma County, with employment increasing 15 percent from 1997 to 1999, while the food processing sector has grown by almost 30 percent over a recent four year time period. An estimated 3,000 people are employed in local food processing. Many local food processors now offer natural and / or organic foods. Almost half the respondents of a recent survey indicated they produced foods that are certified *organic*. This shift to organic food processing could help diversify the agricultural industry and increase the productivity of the sector.

Recent research indicates the two-thirds of local food processors produce fruit-based products, dairy-based products, or pastry / baked goods. Other reported categories include tortillas, olives, eggs, seafood, cooking oil, organic coffee, vinegar, condiments, and specialty gourmet. While 53 percent of the businesses surveyed use national retail stores for product sales, 50 percent use local and / or regional retail sales. In addition, methods of distribution include the internet (40 percent), mail order (38 percent), and on-site sales (37 percent), among others. The survey did not collect data on the origin of raw commodities bought by local processors. [22]

AGRICULTURAL TOURISM [23]

Sonoma County has experienced a growing demand for visitor-serving uses, such as weddings, special events, retail sales, and farm tours, as *value added* support for agricultural production and processing. These uses can conflict with existing farming operations, neighboring residents, rural character, and the long term viability of agriculture.

A primary goal of the existing *General Plan* is to protect agriculture. Visitor-serving uses on agricultural lands designated in the existing *General Plan* must support agriculture, but be secondary to production and processing. Such uses are limited to tasting rooms, stands for sale of agricultural products grown or processed in the county, bed and breakfast inns, and campgrounds. Other existing *General Plan* rural lands allow agricultural tourism uses, but at a much more limited scale than agricultural lands.

Since 1989, there has been a marked increase in the number of wineries, family farms, and other producers who have added new activities to market and promote their agricultural products. At many locations, the simple practice of providing customers with a tour, a sample, and an opportunity to buy direct from the farm has evolved to selling other foods, gifts, merchandise, and arts and crafts; overnight accommodations; weddings; and special events for both promotional and charitable

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21 *Food Processing: Sonoma County's Emerging Center of Innovation*, Sonoma County Economic Development Board, Spring 2002.

22 *Food Processing: Sonoma County's Emerging Center of Innovation*, Sonoma County Economic Development Board, Spring 2002.

23 The information in this section is based upon:
Agricultural Tourism, CAC memo, Greg Carr and Scott Briggs, PRMD, March 20, 2003; and *Economics Discussion Paper: Agricultural Processing*, Economic & Planning Systems, Inc, June 2002.

purposes. The escalating property values tend to force some rural property owners to seek to convert to or to add these higher earning, tourist uses.

URBAN / RURAL CONFLICTS

Urban / rural conflicts occur at the interface of agricultural and non-agricultural uses. Development introduces new residents who are exposed to and / or interfere with agricultural operations. Depending on the types of nearby agricultural operations, visitor's and resident's complaints typically involve dust, odors, noise, presence of pests, manure, or spray drift where agricultural chemicals are applied. Agriculturists' complaints generally include trespass, vandalism, and theft. Even when people move to an area expressly for its rural character, these conflicts can occur as a result of their expectations, urban values, and essentially residential (not agricultural) activities.

In Sonoma County, residents, trail users, and visitors most frequently complain about the use of pesticides, dust from cultivation, noise, and odors from agricultural operations. Noise complaints often result from the use of frost protection wind turbines in the winter and bird control guns during harvest season, while dairies can result in odor complaints. In addition, it is becoming more common to conduct harvest activities at night which leads to additional noise complaints. [24]

Sonoma County has undertaken several actions to reduce urban / rural conflicts including the enactment of a Right to Farm ordinance and the establishment of agricultural setbacks (see discussion of Right-to-Farm ordinance, below). Urban / rural conflicts are discussed in ***Section 4.1 Land Use, Population and Housing***.

AGRICULTURAL PRESERVATION – WILLIAMSON ACT AND CONSERVATION EASEMENTS

As the urbanized parts of Sonoma County continue to expand, the pressure for development on agricultural lands is increasing. The many factors that might make a piece of property ideal for farming are similar to the factors that might make a piece of property attractive for development. A handful of programs are available to assist farmers in the county who wish to continue using their lands for agricultural purposes.

The most common methods include the use of the California Land Conservation Act of 1965 (also known as the Williamson Act) and the purchase of conservation easements. [25] Currently, it is estimated that about 300,000 acres of agricultural land in Sonoma County are under Williamson Act contracts (of which 31 parcels totaling 2,658 acres have filed for non-renewal). Using easements or fee title, approximately 30,000 acres of agricultural land are protected by the Sonoma County Agricultural Preservation and Open Space District. The Sonoma Land Trust protects 2,667 acres of agricultural land and 1,134 acres of sustainable forestry land. Agricultural easements specifically identified by the County Assessor's Office protect approximately 400 acres in the county, a figure not reflective of the above-noted acreages, because most recorded easements are termed conservation,

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24 Nichols • Berman communication with Gail Davis, Agriculture and Vineyard Conservation Coordinator, Office of the Agricultural Commissioner, July 2002.

25 The Williamson Act is further discusses in the State Regulations section contained in the Regulatory Setting.

open space, or scenic easements. [26] Additional agricultural and timber lands may be protected where lands are protected by other types of easements, including conservation, open space, and scenic easements.

SONOMA COUNTY AGRICULTURAL PRESERVATION AND OPEN SPACE DISTRICT [27]

The Sonoma County Agricultural Preservation and Open Space District (SCAPOSD) was initiated by the passage of two measures that established the SCAPOSD and a one-quarter percent sales tax for its funding. The SCAPOSD, a special district covering the entire county, works with willing landowners to protect agricultural, open space, natural resource, and recreational lands.

The SCAPOSD acquires two types of real property interests: conservation easements (partial interest) and land in fee (full interest). Some easements are required to be dedicated to the SCAPOSD through the county planning and permitting process. Conservation easements allow farmers and ranchers to obtain cash payment and continue in agricultural pursuits on the property, in exchange for limiting the future development potential. A conservation easement is a legally binding agreement that runs with the deed and restricts the use of the land in perpetuity. The landowner voluntarily limits development and some other uses of the property, which generally results in property tax savings for the landowner. The easement governs the use of the property no matter who owns it in the future, allowing the property to be sold, leased, or bequeathed. Other financial benefits to landowners may include income, capital gains, and / or estate tax reductions, as well as property tax advantages. Landowners who have sold conservation easements have been motivated by the desire to continue in agriculture, with the cash often seen as a way to achieve both preservation of their way of life, including their home; the landscape values of the property; and other goals including saving for retirement and making farm improvements.

As of September 2002, the SCAPOSD had secured a total of approximately 56,200 acres through conservation easements, fee acquisition, and permit requirements. This total includes agricultural easements, as well as greenbelt, natural resources, and recreation easements and acquisitions. The SCAPOSD has protected more than 30,000 acres of agricultural land. In southwest Sonoma county more than a dozen dairy and livestock ranches, totaling more than 8,700 acres, have been protected. Greenbelt agricultural lands provide separation between and around the county's nine cities. Several of the SCAPOSD greenbelt properties are leased to small farmers. Protected greenbelt lands that provide for continued agricultural production include the Morrison Brothers Dairy, Stony Point Ranch, and the Knudtsen and Aggio properties along the US 101 corridor, as well as the Silacci Dairy, Cloudy Bend, and Sleepy Hollow properties south of Petaluma. The SCAPOSD protects land in other agricultural areas, including the Alexander, Knights, Dry Creek, Sonoma, and Russian River Valleys.

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[26] Nichols • Berman communication with Ed Rogers, Sonoma County Assessors Office, December, 2002; and *SCAPOSD Land Rights Inventory,* Sonoma County Agricultural Preservation and Open Space District, February 20, 2002.

[27] The information in this section is based upon:
Acquisition Plan – A Blueprint for Agricultural and Open Space Preservation, Sonoma County Agricultural Preservation and Open Space District, 2000; *California Farmers and Conservation Easements: Motivations, Experiences, and Perceptions in Three Counties*, University of California Agricultural Issues Center, December 2000; and *SCAPOSD Land Rights Inventory,* Sonoma County Agricultural Preservation and Open Space District, February 20, 2002.

One of the largest conservation easements protects the 7,877 acre Santa Angelina Ranch in Knights Valley. [28]

TIMBER

Timber Production / Harvesting [29]

Timber production value has increased steadily in Sonoma County. In 1985, timber production value was a little over five million dollars, while by 2000; it was valued at almost $20 million. This figure reflects the increasing cost of wood products as well as the amount of harvesting that occurred. In Sonoma County there are approximately 229,475 acres of timberland. [30] The commercial timber species include redwood, Douglas fir, and several other conifer species; timberlands tend to be concentrated in northwestern Sonoma County where conifer and conifer/hardwood forests dominate.

From 1989 through 2001, a total of 58,381 acres of timberland were approved for timber harvesting in Sonoma County, under the guidance of California Department of Forestry and Fire Protection (CDF) and the timber harvest plan (THP) review process (see discussion of State forestry regulations, below). These harvested acres are concentrated in the remote areas of the northwest part of the county. There also have been some small timber harvesting activities (less than three acres) that have been carried out in conjunction with minor timber conversions and THP exemptions typically closer to developed areas.

Timberland Conversion Trends [31]

Timberland is considered by the State and the County to be different than agricultural land. Timberlands are not included in the State farmland mapping. The County has created different land use policies for agriculture and timberlands. Converting timberland to an agricultural use is different than a crop rotation, in that once the effort and expense is made to convert timberland to cropland; it is seldom, if ever converted back and is permanently lost from the timberland inventory.

CDF keeps records of the large timberland conversions and small conversion exemptions. Large conversion requests are those greater than three acres in size while small conversion requests are those less than three acres in size. Based on these records, from 1989 through 2004, 19 of the 22 large

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28 *A Decade of Preservation,* Sonoma County Agricultural Preservation and Open Space District (SCAPOSD), 2002.

29 The information in this section is based upon:
Regulating the Location of Timber Harvest Activities, CAC memo, David Schiltgen, June 20, 2002; and *Economics Discussion Paper: Agricultural Processing*, Economic & Planning Systems, Inc, June 2002.

30 Timberland is generally defined as "land which is available for, and capable of, growing a crop of trees of any commercial species used to produce lumber and other forest products."

31 The information in this section is based upon:
Regulating the Conversion of Timberlands to Nontimber Uses, CAC memo, David Schiltgen, June 20, 2002; and *Supplemental Information Regarding Timber Conversions and Timber Harvest Plans,* CAC memo, David Schiltgen, PRMD, July 18, 2002.

conversion requests approved were to accommodate vineyards. [32] [33] The remaining approved large conversions were the Sea Ranch Reservoir, a soil dump, and a sewage treatment plant for the Gualala Community Services District.

During this period, a total of 851 acres of timberland were approved for conversion. Of this total, 425 acres were converted through large acreage conversions. All but 56 of these acres, developed as the reservoir, soil dump, and sewage treatment plant previously described, were for vineyard uses. In addition, 426 acres were approved through small conversion exemptions. A significant number of these small acreage conversions were approved between 1992 and 1994. This is attributed to the fact that log prices increased significantly during that period and conversions were routinely approved as ministerial permits. A Timber Harvest Plan (THP) prepared by a registered professional forester (RPF) was not required until 1996, the same year that Sonoma County began requiring a zoning permit for these conversions.

As of September 2004, CDF had six large timber conversion applications pending for an additional 369 acres, all of which were for vineyards. If approved, these would raise the 15 year total for timber conversion to 1,220 acres. [34] [35]

The loss of timberland through the conversion process may be partially offset by new lands brought into timber production. The CDF reports that from 1989 to 2001, a total of 732 acres were planted to commercial timber species. These plantings occurred primarily in the area of the 1978 Creighton Ridge fire near Cazadero.

With the increasing profitability of the wine industry in the past decade, the conversion of timberlands to vineyards has become a growing concern for some residents, particularly in the northwest portion of the county where much of this conversion is taking place. The last few years have seen an increased interest in locating vineyards within the coastal timberland regions due to desirable soils for pinot noir grapes. The acreage of pinot noir grapes has almost tripled since 1996. Whether or not this trend will continue depends on a variety of factors, including economic concerns such as market surplus and demand.

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[32] Nichols • Berman communication with David Schiltgen, Planner III, Sonoma County PRMD, December 2004.

[33] *Sonoma County Timberland Conversion Permit Statistics,* California Department of Forestry, September 2004.

[34] Nichols•Berman communication with David Schiltgen, Planner III, Sonoma County PRMD, December 2004.

[35] *Sonoma County Timberland Conversion Permit Statistics,* California Department of Forestry, September 2004.

Agricultural and Timber Resources – Regulatory Setting

COUNTY REGULATIONS

Zoning [36]

The Sonoma County Zoning Regulations include three agricultural use categories: Land Intensive Agriculture (LIA), Land Extensive Agriculture (LEA), and Diverse Agriculture (DA). Each category permits the full range of agricultural uses. The categories differ primarily in the types and intensities of agricultural support services, visitor-serving uses, and residential densities.

Most of the county's timberlands are zoned Timber Production (TP) or Resources and Rural Development (RRD), which allow land management for commercial production including controlled burns, and timber management for noncommercial purposes including harvesting and incidental milling, subject to the requirements of the CDF.

As of March 2002, the County had approximately 94,000 acres zoned TP. The designated TP parcels contain approximately 69,000 acres of timberland or about 30 percent of the 230,000 acres of timberland in the county.

Right to Farm Ordinance

Sonoma County's Right to Farm ordinance was originally adopted in 1988 and revised in 1999 to include stronger disclosure requirements. The basic intention of the ordinance is to provide public policy support for maintaining the viability of agriculture in Sonoma County. Two of the major features of the Right to Farm ordinance are the farmers' right to conduct agricultural operations, and that legal, properly conducted agricultural operations will not be considered a nuisance. Neighbors retain the right to file complaints regarding agricultural activities. The protections afforded by the ordinance apply only to agricultural operations on land designated as LIA, LEA, or DA. [37]

Right to farm ordinances generally affect code enforcement activities and have the purpose of reducing the opposition of urban neighbors to commercial agriculture as a nuisance generator. Landowners within the unincorporated county are required to disclose the Right to Farm ordinance provisions to prospective buyers as part of real estate transactions, at the close of escrow and in a recorded document. Also, notice is also sent in annual tax bills countywide in the unincorporated area. Notice also must be given to developers in connection with new development. [38]

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36 The information in this section is based upon:
Regulating Location of Timber Harvest Activities, CAC memo, David Schiltgen, June 20, 2002; and *Regulating Conversion of Timberlands to Nontimber Use,* CAC memo, David Schiltgen, June 20, 2002.

37 Sonoma County Ordinance No. 5203, approved by the Board of Supervisors, October 19, 1999.

38 *County Right-to-Farm Ordinances in California: An Assessment of Impact and Effectiveness*, Matthew Wacker et al, University of California Agricultural Issues Center, May 2001.

Vineyard Erosion and Sedimentation Control Ordinance

Effective as of March 2000, Sonoma County's Vineyard Erosion and Sedimentation Control Ordinance (VESCO) requires growers to submit erosion and sediment control plans for all new vineyards planned for slopes exceeding ten percent on highly erodible soils or 15 percent on all other soils. The ordinance also applies to replanting desired on slopes exceeding 15 percent on highly erodible soils or 30 percent on all other soils. Planting is limited on slopes greater than 50 percent. VESCO is designed to protect water quality and conserve soil through the use of riparian setbacks, maximum slope allowed for vineyard planting, and other requirements. VESCO, as it relates to soil erosion and water quality, is further discussed in ***Section 4.5 Hydrology and Water Resources.***

Agricultural Setbacks

The County Zoning Code establishes agricultural setbacks that provide a buffer between agricultural operations on lands designated agricultural in the existing *General Plan* and adjacent non-agricultural land uses. Generally, the buffer is defined as a physical separation of 100 to 200 feet on the development side. [39]

Timber Harvest Operations

Although the Forest Practice Act preempts local authority to regulate the conduct of timber operations, courts have not yet determined whether the FPA precludes the County from enacting zoning regulations to govern the location of timber operations outside of designated TPZs. Because of the current state of flux in case law regarding this, it is impossible to accurately pinpoint the extent of the County's regulatory authority. A preliminary survey of existing case law, however, shows that the County may have the following authority:

Within TPZs The county has approximately 94,000 acres in TPZ. Of this amount, 69,000 acres are timberland. Within these areas, it is the intent of the Timberland Productivity Act (TPA) that timber operations conducted in compliance with the FPA not be restricted or prohibited due to conflict or apparent conflict with surrounding land uses. As State law preempts local regulation, the current regulatory setting does not provide the County any authority to regulate the location or the conduct of timber operations in this zone

Outside of TPZs There are approximately 161,000 acres of timberland outside of TPZs. Within these areas, localities may be able to regulate the location of timber operations, but only to the extent that the County's regulations do not conflict with State law. The courts are still weighing this issue. As such, the County could not impose zoning restrictions on the hours of operation, noise, pesticide application or similar aspects timber harvest operation. However, the County may be able to require a setback for timber harvesting and / or timber yarding from residential or other existing incompatible uses. The County may also be able to disallow timber harvesting activities as permitted uses in specific zoning districts.

Timber Conversions

On county lands zoned Timber Production or Resource and Rural Development, the County permits both timber production and other compatible uses. Landowners may convert timberlands to

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[39] Sonoma County Ordinance No. 4101, approved by the Board of Supervisors, November 7, 1989.

agriculture or other non-timber uses on these lands as long as required rezoning, conversion permits, and Timber Harvest Plans are obtained from the CDF. The County has limited authority under the Forest Practice Act to regulate timber conversions as long as such regulations do not usurp State regulation of timber harvest operations.

STATE REGULATIONS

Williamson Act [40]

The California Land Conservation Act, known as the Williamson Act, allows counties to establish agricultural preserves with landowners who are engaged in commercial agricultural operations. It is intended to help conserve agricultural lands as an important economic resource, to assist in insuring adequate food supply for future generations, and to encourage the preservation of lands with unique open space or habitat value. In signing a contract with Sonoma County, the landowner agrees to retain his or her land in agricultural or open space uses for at least ten years, and the contract will run with the land when it is sold. Lands under Williamson Act contracts are appraised by the County Assessor based on their agricultural productivity rather than on their market value, which can greatly reduce tax obligations for the landowner. Lands under Williamson Act contracts must meet specific requirements including county zoning limitations, minimum lot size, and minimum annual gross returns from the agricultural use. The contract is for a minimum of ten years and automatically renews annually until either the County or the landowner submits a non-renewal request. Except under exceptional circumstances, the contract will then phase out over the course of the remaining nine-year period.

In 1998 the State passed the Farmland Security Zone law, sometimes known as the Super Williamson Act. Under the law, farmers can receive an additional 35-percent reduction in the land's value for property-tax purposes. To earn the additional tax reduction, farmers must agree to keep their land in the conservation program for 20 years, twice as long as required by the Williamson Act. Sonoma County adopted the Super Williamson Act through a county resolution on October 2, 2001, but has not yet received any applications for properties under that act.

California Department of Food and Agriculture (CDFA)

The California Organic Foods Act (COFA) of 1990, enacted at the behest of the organic industry, established standards and labeling requirement for products represented as organic or organically produced. The law divides responsibilities between CDFA, which oversees fresh products, and Health Services, which covers processed products. The program coordinates with the Organic Food Advisory Board, coordinates county investigation efforts, collects registration fees, subvenes funds to counties, and acts as a resource for information on the California Organic Law. Other activities include training

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40 The information in this section is based upon:
Terms and Concepts; Agricultural Preserve, Sonoma County Assessor, http://www.sonoma-county.org/assessor/html_documents/termsconcepts/agpreserve/ag_preserve.htm, December, 2002; *Ag Alert: 'Super Williamson Act' is Constitutional*, Dave Kranz, California Farm Bureau Federation, Communications/News Division, March 24, 1999; and Nichols • Berman communication with Traci Tesconi, Planner III, Sonoma County Permit and Resource Management Department, December, 2002.

county biologists, initiating complaint investigations, and registering private certification organizations. [41]

Forest Practice Rules [42]

In 1973, in response to difficulties arising from the conflicting logging rules that had been enacted by jurisdictions at the local level, the State Legislature adopted the Z'berg-Nejedly Forest Practices Act (FPA) regulating the conduct of timber operations. In passing the FPA, the legislature expressly preempted the ability of local jurisdictions to regulate the conduct of timber harvesting operations and gave this authority to the State Board of Forestry and the California Department of Forestry (CDF), who were to adopt and implement Forest Practice Rules (FPR). It was the intent of the legislature that timber operations conducted in a manner consistent with the Forest Practice Rules not be restricted by local governments' regulations.

The FPR for the Coast District, which includes Sonoma County, address such operational concerns as fire prevention, soil erosion, water quality, watershed and flood control, stocking, protection of young growth, soil productivity, control of insects, pests and disease, protection of natural and scenic qualities, stand density, reforestation methods, soil movement, debris disposal, wind throw, noise, treatment of slash and debris, hours of operation, and silvicultural methods.

The FPR include procedures and requirements that must be met before timberlands can be converted to non-timber uses. The requirements for conversions differ depending on whether or not the conversion exceeds three acres and whether or not it is in a Timberland Production Zone (TPZ - see below). Single conversions involving less than three acres are exempt. To convert timberland within the TPZ, applicants must obtain a Timberland Conversion Permit and prepared a Timber Harvest Plan (THP) that has been approved by the CDF. Outside of a TPZ, the findings necessary to approve the conversion are less burdensome.

Timberland Production Zones (TPZ) [43]

In 1976, the legislature adopted the Forest Taxation Reform Act. That Act requires counties to provide for the zoning of parcels used for the growing and harvesting of timber as Timberland Production Zones (TPZ). A TPZ restricts the use of the land to the growing and harvesting of timber and compatible uses approved by the County in return for tax assessment benefits. The County subsequently designated many parcels as TPZ in the late 1970's.

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41 *California Organic,* California Department of Food and Agriculture, http://www.cdfa.ca.gov/is/fveqc/organic.htm, August 2003.

42 The information in this section is based upon:
Regulating Location of Timber Harvest Activities, CAC memo, David Schiltgen, June 20, 2002.

43 The information in this section is based upon:
Regulating Location of Timber Harvest Activities, CAC memo, David Schiltgen, June 20, 2002

Timberland Productivity Act [44]

In 1982, the State Legislature adopted California Timberland Productivity Act (TPA). The TPA was intended to protect properly conducted timber operations from being prohibited or restricted due to conflict or apparent conflict with surrounding land uses. To accomplish this goal, the TPA directed counties to designate and zone lands for the primary use of timber production. Sonoma County applied local Timber Production (TP) zoning to all the parcels that were previously placed in the above TPZs. Within the TP district, land uses are limited to the growing and harvesting of timber and compatible uses. However, timber harvest operations may also be conducted on timberlands outside of the TP zone in compliance with a THP that has been approved by CDF (see *Zoning* above).

Agriculture and Timber Resources – Significance Criteria

The agricultural analysis uses criteria from the *State CEQA Guidelines* and local conditions. According to these criteria, the project would have a significant agricultural impact if it would:

- Convert Prime Farmland, Farmland of Statewide Importance, Unique Farmland, or Farmland of Local Importance as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Department, to non-agricultural use;
- Convert parcels designated Diverse Agriculture, Land Extensive Agriculture, or Land Intensive Agriculture on the Land Use Plan Map to a non-agricultural land use designation;
- Conflict with existing zoning for agricultural use, or a Williamson Act contract; and
- Involve other changes in the existing environment which, due to their location or nature, could result in conversion of farmland, to non-agricultural use.

The timber analysis uses criteria developed as part of the *Draft GP 2020* policy analysis. Accordingly, a project would have a significant impact on timber resources if would:

- Convert a significant acreage of the county's timberlands to non-timber uses.

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44 The information in this section is based upon:
Regulating Location of Timber Harvest Activities, CAC memo, David Schiltgen, June 20, 2002

Agricultural and Timber Resources – Impacts and Mitigation Measures

Impact 4.8-1 Conversion of Agricultural Lands to Non-Agricultural Uses
*Implementation of the Draft GP 2020 would result in conversions of both County and State designated farmlands to non-agricultural uses. This would be a less-than-significant impact. (**LTS**)*

A major impact on agriculture is the loss of productive land due to its conversion to other uses. Escalating property values and economic conditions in Sonoma County lend themselves to a continued and increasing pressure to convert agricultural lands to residential or other urban uses. The equity value of an acre of land designated residential use in Sonoma County can be substantially higher than that of agricultural land.

The most common way that agricultural land is converted to non-agricultural use is by the expansion of urban boundaries. Lands around the existing city limits of Santa Rosa, Petaluma, Windsor, and other cities are planned for annexation by those cities. Much of this land is either in agricultural production or would be designated for agricultural use by the *Draft GP 2020*. Similarly, some lands within and around some of the unincorporated communities with urban services such as Sonoma Valley, Forestville, Geyserville, and Penngrove are either in agricultural production or would be designated for agricultural use by the *Draft GP 2020*. The *Draft GP 2020* and the general plans of the cities could result in the conversion of lands from agricultural to a non-agricultural use as these urban areas expand.

The State Department of Conservation Farmland Mapping and Monitoring Program (FMMP) measures farmland conversions in two year intervals through aerial photography. As previously stated, much of the State designated important farmland within Sonoma County lies in close proximity to urban areas. According to the FMMP, urban lands (including both those of the cities and unincorporated urban service areas) have increased by a total of 9,975 acres from 1992-2002, a rate of approximately 1,000 acres per year. [45] [46] Urbanization and the increased mapping capability by the FMMP were the major causes of agricultural land conversion, a loss of 27,271 acres during this same period. [47] As mentioned in the setting section, the primary reason for the relatively large decrease in acreage experienced by grazing and ranchland between 2000 and 2002 was the improved mapping of existing rural ranchettes and not the conversion of farmland to development.

Problematic to this analysis is the fact that the FMMP data does not delineate between county and city lands, nor does it directly correlate with Sonoma County agricultural land designations. Furthermore it does not quantify how much conversion is the result of development occurring within adopted urban growth boundaries.

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45 *California Farmland Conversion Reports*, California Department of Conservation, 1992 through 2002.

46 The FMMP data likely underestimates the amount of conversion occurring within the county. The FMMP maps do not include urban development on parcels less than ten acres in size that are entirely surrounded by farmland, certain types of low density residential development, nor does it map a small percentage of private lands.

47 *California Farmland Conversion Reports*, California Department of Conservation, 1992 through 2002

As sufficient data are not available to determine precisely where State designated important farmlands would be converted in the unincorporated portion of the county, any attempt to quantify such conversion would be speculative. However, based on the location of these lands in close proximity to urban areas, it would be reasonable to expect that a portion of this conversion would continue to occur within the unincorporated portion of the county along the urban fringe. Further analysis of this cumulative impact is considered in ***Section 6.2 Cumulative Impacts.***

As noted above, urbanization is the most common form of land conversion. However, productive lands can also be lost to other uses. The *Draft GP 2020* would permit non-agricultural land uses to occur on lands designated LEA, LIA, and DA such as housing, surface mining operations, recreational uses (e.g., campgrounds), and community services facilities (e.g., churches, schools, and granges). Development of such uses would convert some portion of agricultural lands within the unincorporated area to these non-agricultural uses.

Data are not available to quantify the acreage that might be affected by these uses. However, these uses would not be expected to result in a substantial conversion or loss of agricultural land as they tend to be small and scattered throughout agricultural production areas. As such, they generally would not result in the conversion of all agricultural uses on every property. One exception to this would be surface mining operations, but the County's *Aggregate Resources Management Plan* limits the acreage that can be converted to mining uses.

Farmland could also be lost to future agricultural use as a result of riparian corridor and biotic habitat protection policies contained in the *Draft GP 2020*. These policies would not cause the loss of existing crops but could limit future agricultural production along streams and in other designated biotic resource areas. While this loss of future agricultural use is not typically considered to be conversion under CEQA, it is important to include in this discussion as a large acreage may be affected by these policies. The *Draft GP 2020* Open Space and Resource Conservation Element would increase stream conservation zones on agricultural land from about 9,000 to about 70,000 acres.

In addition to the loss of agricultural productivity, the conversion of these lands to non-agricultural uses could also result in adverse economic impacts. Much of the economic gain experienced by local communities from urban development of agricultural lands could be short-term, generated by the initial development and construction activities. Farmland conversion hurts local economies because of agriculture's economic multiplier effects. That is, each dollar earned by agricultural production stimulates additional indirect economic activity in the agricultural processing and tourism sectors. Agricultural production supports more than 10,000 jobs or five percent of the total county employment yet generates jobs well past this amount due to related agricultural processing and visitor-serving uses. [48]

Agricultural lands also provide open space as they comprise the majority of the county's Community Separator and Greenbelt areas. This resource is valued by the residents of Sonoma County as it improves the quality of life through the contrast of its visual and aesthetic properties with those of urban congestion. Visual resources are addressed in ***Section 4.11 Visual Resources.***

As described in ***Chapter 3.0 Project Description***, the *Draft GP 2020* proposes amendments to existing Land Use Plan designations. **Exhibit 4.1-2** shows the proposed land use designation changes by

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48 *Sonoma County Land Use Audit*, Economic and Planning Systems, Inc. October 2003.

Planning Area and **Exhibit 4.1-3** shows the existing and proposed acreage for all of the land use designations.

Analysis of the proposed Land Use Amendments indicates implementation of the *Draft GP 2020* would result in the following:

- There would be no conversion of State Designated Important Farmland and no redesignation of County agricultural land use (i.e., LEA, LIA, or DA) in five of the nine Planning Areas (the Sonoma Coast / Gualala Basin, Russian River, Santa Rosa, Sebastopol, and the Rohnert Park / Cotati Planning Areas);

- Expansion of the USA boundary for Geyserville (Amendment 2-16) would allow 5.1 acres of State designated Prime Farmland to be annexed to the sewer district. However the land is already zoned for commercial use;

- In the Healdsburg Planning Area, several amendments could affect agricultural lands. Amendment 3-4 would increase agricultural lands by 82 acres, although a few acres may be used for a winery. Amendment 3-6 would also increase agricultural land but allow a small area for commercial use. Amendment 4-5 would change 304 acres of agricultural land to public use. This amendment would recognize a previously approved project to develop a regional park on a reclaimed surface mine;

- Amendment 8-4 in the Petaluma Planning Area would recognize a previous decision by the City of Petaluma to develop a wastewater recycling project on lands currently designated for agricultural use; and

- In the Sonoma Valley Planning Area, Amendment 9-5 would convert 4.5 acres of State designated Important Farmland to a recycling facility. This land is currently designated for rural residential use.

In summary these land use amendments would result in only 9.6 acres of State designated farmland being converted to non-agricultural use. Similarly, only a few acres of County designated agricultural land would be lost, as virtually all of the Land Use Amendments proposed by the *Draft GP 2020* to recognize previously approved conversions for public uses.

The *Draft GP 2020* contains policies to reduce the amount of conversion of agricultural land that would occur through several mechanisms. These include the economic promotion of Sonoma County agricultural goods to increase farm profitability, an urban centered growth strategy to stabilize the urban fringe, and maintaining low rural development densities.

Policies **AR-1a** through **AR-1d** would improve agricultural economics and promote the agricultural products of Sonoma County. These policies would assist and promote agriculture through advertising and marketing assistance as well as promoting brand recognition and food safety to the consumer. These programs could increase the profitability and identity awareness of county agricultural products, and would therefore maintain the viability of Sonoma County farms and reduce the likelihood of their conversion. Policies **AR-1e** and **AR-1f** would specifically support programs to promote sustainable and organic products in the overall marketing of Sonoma County as a reflection of consumer demand for these foods.

The *Draft GP 2020* would employ an urban centered growth strategy and contains policies designed to stabilize the urban fringe. Urban Service Boundaries and policies in the Land Use Element would

support this strategy. These policies would limit development opportunities to a relatively small number of landowners and would produce more compact development, thereby reducing the amount of agricultural land converted to urban or permitted land uses. Policy **AR-2a** would limit residential and commercial or industrial growth in agricultural areas by prohibiting the extension of necessary urban services into these areas except as allowed in Community Separators policy **OS-1c** and where extension of urban services would be required to solve a health and safety problem (e.g., where septic systems have contaminated the groundwater). Policy **AR-4a** would require that the primary use of agricultural lands be agriculture. This policy, while recognizing that some non-agricultural uses would be allowed, protects against the conversion of these lands.

Policy **AR-2d** would limit conversion by using voluntary purchase of development rights (PDR) or transfer of development rights (TDR) programs in order to limit intrusion of residential development on agricultural lands. When used, amendments of the land use map would not be allowed to lower density in anticipation of conferring transfer or purchase rights.

In addition to the *Draft GP 2020* policies, the Sonoma County Agricultural and Open Space Preservation District (SCAOSPD) would reduce conversion impacts to agricultural resources through continuation of its *Acquisition Plan 2000*. As previously stated in the environmental setting section, the SCAOSPD has preserved some 30,000 agricultural acres in perpetuity through the application of conservation easements and in fee purchases.

The *Acquisition Plan 2000* focuses on two priority areas within Sonoma County. The first is coastal grazing lands with high grassland productivity that support dairy, poultry, and cattle within the southwest portion of the county. The second is Greenbelt Agriculture and the promotion of the Small Farms Initiative where the district leases land primarily fee owned Greenbelt properties to farmers who grow vegetables, flowers, herbs and berries, a growing amount of which is organic. As these greenbelts occur at the urban fringe, their continued acquisition and use would prevent conversion to non-agricultural uses as well as having the added benefit of supporting sustainable communities.

In conclusion, while cumulative development consistent with both the *Draft GP 2020* as well as those of the general plans of the county's nine cities could result in the conversion of State and County designated farmlands, it is important to distinguish that the *Draft GP 2020* limits such conversion to lands within the Urban Service Boundaries. Lands within the unincorporated USAs would primarily be reserved and designated to accommodate projected population growth through 2020 but this growth would mostly be infill of existing developed land. As a result of this urban centered growth strategy and the policies described in the Agricultural Resources and Land Use Elements of the *Draft GP 2020*, significant agricultural resource areas would be protected in the unincorporated area.

Further, as previously noted, adoption of land use amendments in the *Draft GP 2020* would not result in the substantial conversion of State or County designated agricultural land. The *Draft GP 2020* would include over 800,000 acres of land available for agricultural use. The FMMP indicates that over 600,000 acres of State designated farmland (e.g., Prime Farmland, Farmland of Statewide Importance, etc.) are currently available for agricultural use. Voter approved Urban Growth Boundaries would minimize the potential for urban sprawl into agricultural areas. Loss of agricultural use on lands protected by riparian corridor and biotic habitat designations and policies would represent the greatest acreage of agricultural land conversion. While this total of about 61,000 acres would be much greater than the losses to urban and rural development, it would remain a very small percentage of the county's inventory of land available for agriculture. For these reasons, the relatively minor conversion of agricultural lands to non-agricultural uses that would occur through implementation of the *Draft GP 2020* would be a less-than-significant impact at a countywide scale.

Mitigation Measure 4.8-1 None Required

Impact 4.8-2 Agricultural Processing and Support Uses

Implementation of the Draft GP 2020 would result in the development of agricultural support uses including processing services and storage on agricultural lands and would therefore remove a portion of the county's agricultural lands from agricultural production. However, due to the limited acreage that would be removed as well as policies and programs contained in the Draft GP 2020 regulating such development, this would be a less-than-significant impact. ***(LTS)***

As previously mentioned, the development of agricultural processing and other support uses would be of substantial benefit in keeping agricultural operations economically viable as well as preventing the loss of these lands to expanded residential development or other land uses permitted by the *Draft GP 2020*. However, the increasing number, size, and concentration of these uses have raised concerns about the conversion of agricultural land, the loss of agricultural production, and the long-term viability of agriculture. Since 1989, the county has seen a substantial increase in processing and support uses on agricultural lands. With respect to agricultural processing facilities, these include: an increase in the number of wineries, the expansion of existing wineries, and an increase in the capacity and size of some of the new wineries. Conversion pressure has intensified as a significant portion of the existing industrial lands that could accommodate processing facilities in the county are being developed by high-tech businesses.

Agricultural support services are businesses that provide services purchased by farmers. Storage facilities not linked to either an agricultural product or a processing facility also have been requested at times. Because of these, and other factors, support services and storage facilities have been problematic land uses because their location in agricultural areas has a less direct dependency on agricultural production than processing. Uses such as farm equipment repair or case goods storage at a winery have been routinely accommodated by County permits. However, uses such as tractor sales, manufacture and sales of fencing, and stand-alone warehouses are less connected to the farm and can more easily be converted to non-agricultural activities. [49]

Goal **AR-5** of the Agricultural Resources Element would encourage the development of new agricultural processing facilities and support services in some agricultural areas as value added support to agricultural production. Implemented by Policy **AR-5a,** the *Draft GP 2020* would permit the development of facilities that process agricultural products provided at least 50 percent of the product being processed is grown or raised on-site or in the local area. While policies contained in Section 2.5 of the Agricultural Resources Element would limit the size and intensity of these uses, Policy **AR-5a** would create a tension between those policies that promote the development of agricultural processing uses with those policies intended to protect land needed for agricultural production.

Estimating the amount of land needed for support uses that could occur on agricultural lands with implementation of the *Draft GP 2020* was accomplished through PRMD consultations with various representatives from the county's agricultural sectors. As the primary demand for this type of development would likely come from viticulture, the projected demand for new or expanded wineries was estimated as a function of vineyard acreage increases described in *Impact 4.8-1 Conversion of Agricultural Lands to Non-Agricultural Uses.* The projected amount of development of processing

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49 *Agricultural Processing and Support Services,* CAC Memo, Greg Carr and Scott Briggs, Sonoma County PRMD, February 20, 2003.

and related support is shown in **Exhibit 4.8-4**. Impacts resulting from the development of visitor-serving uses are discussed separately in *Impact 4.8-3 Agricultural Tourism.*

County staff, in a collaborative effort with the Agricultural Commissioner's Office and the Sonoma County Grape Growers (SCCG), devised the following methodology to estimate new winery development. First, the total grape production of the projected 16,000 acre increase in new or expanded vineyard plantings was calculated based upon the average grape production per acre in Sonoma County in 2000. Based on an SCCG conversion factor of approximately 64.5 cases of wine per ton of grapes, and using assumptions with respect to both winery capacities and the projected level of imported grapes, the total case production for new plantings was estimated for 2020.[50]

It was then assumed that 50 percent of the increased case production would be accommodated by the expansion of existing wineries and that the remaining 50 percent would be processed in new wineries built within the same geographic locations where the projected new plantings were located. The projected 2020 case production was then converted to winery square footage assuming 0.75 square feet of facility per case of wine.

As shown in **Exhibit 4.8-4**, with implementation of the *Draft GP 2020,* the number of wineries could grow from 127 facilities with an area of 9,324,000 square feet in 2000, to 239 facilities, with a total estimated area of 16,912,000 square feet in 2020. While these increases to both the number and area of wineries do not reflect actual development projects, they do represent the best estimate of wineries that would be required to process grape production associated with projected vineyard expansion.

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50 Nichols • Berman communication with Scott Briggs, Environmental Review Division Manager, Sonoma County PRMD, September 2004.

Exhibit 4.8-4
Comparison of Agricultural Processing and Visitor-Serving Uses Associated with Vineyard Development

Planning Area	Existing 2000		Projected 2020	
	No. of Wineries [a]	Area (Square Feet)	No. of Wineries [a]	Area (Square Feet)
Sonoma Coast / Gualala Basin	2	18,375	6	424,000
Cloverdale	34	3,704,425	71	6,464,000
Healdsburg	37	1,932,450	56	2,740,000
Russian River	11	541,250	16	947,000
Santa Rosa	14	506,625	21	963,000
Sebastopol	5	525,000	12	1,057,000
Rohnert Park - Cotati	0	0	4	253,000
Petaluma	0	0	10	632,000
Sonoma Valley	24	2,095,875	43	3,432,000
Total	***127***	***9,324,000***	***239***	***16,912,000***
		Increase from 2000 Level	+112	+7,588,000
		Percent Increase	+88%	+81%

a "Wineries" includes associated uses (i.e., storage and bottling) and visitor-serving (i.e., tasting rooms and event centers).

Source: *Sonoma County PRMD, 2004.*

While the exact locations where such development would occur are unknown, a significant portion would likely occur on County and / or State designated agricultural lands. This would result in the loss of agricultural production on these lands. The development of winery and related facilities that would result from projected vineyard increase could reach an additional 7,588,000 square feet, or approximately 174 acres, by 2020. However, it would be reasonable to expect that the actual amount of agricultural land lost to this type of development would be higher as these projections only account for support uses and do not account for related access roads and parking lots that would be constructed.

The *Draft GP 2020* contains policies intended to reduce the impact through regulating the type, size, and intensity of this development. Policy **AR-5a** would provide for processing facilities on all three agricultural land use categories only where it can be clearly demonstrated that at least 50 percent of the

product would be grown on site or in the local area.[51] [52] This would prevent the development of processing facilities clearly not associated with or vital to Sonoma County agriculture and thereby reduce the impact of agricultural land loss. Additional criteria contained in this policy would require the processing operation be dependent upon a long-term commitment to purchasing Sonoma County products, that a demonstrated processing need exists, that size be proportional and minimal to accomplish processing, that future use of the facility would be limited to consistent uses in the event the agricultural product is no longer available, and that accessory space would be limited within such facilities.

Policies **AR-5b** and **AR-5c** would reduce impacts by limiting the size and intensity of processing facilities to that which would actually be required to meet the demands of the growing operation. Policy **AR-5b** would establish zoning code standards limiting the amount of impermeable surface area and requiring that the facility be proportional to the total area of the parcel. Furthermore, policy **AR-5c** would require that the processing facility not exceed the needs of the growing operation as well as that the zoning code differentiate the need between on-site storage required for processing versus that required to store the finished product (e.g., cases of bottled wine).

Policies **AR-5d** through AR-**5f** would limit development of non-essential support facilities that otherwise could be located on non-agricultural lands. Policy **AR-5d** would continue to define agricultural support services as those uses clearly tied to agricultural operations. Policy **AR-5e** would require that such uses be subordinate to on-site agricultural production and would not adversely affect the agricultural production in the area. The criteria used to determine whether the standard is met would require County staff to examine the ratio of service area to production area, the ratio of service employees to agricultural production employees, the historical production of the site, and the potential for the service facility to be converted to non-agricultural uses. Policy **AR-5f** would continue to apply restrictive criteria to the zoning or permit review process. This would reduce cumulative impacts to agricultural resources and public services as uses that require the extension of water and sewer lines, detract from on-site or local agricultural production, result in a concentration of such uses in a localized area, or result in conflicts with adjacent residential areas would be prohibited.

Policy **AR-5g** would further reduce cumulative impacts resulting from the concentration of processing, support and storage facilities within a given transportation corridor or localized area through the application of additional project screening criteria. Factors that would be considered include whether the use would: be inconsistent with or exceed service level objectives described in the Circulation and Transportation Element; interfere with other area wells; exceed prescribed density limits; or be detrimental to the county's rural character.

The intent of these policies (primarily the requirement that 50 percent of the product being processed be grown within the county) would be to ensure that if local farmland is taken out of production for a processing facility, the facility is used to meet the needs of Sonoma County farmers. However, while loss of agricultural lands to processing and support uses promoted in the *Draft GP 2020* would be reduced by these policies, both State and County designated farmlands would still be lost to these uses.

In spite of this loss of approximately 200 to 300 acres of agricultural land to support uses, this would be considered a less-than-significant impact as over 600,000 acres of State designated farmland (e.g.,

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51 The "local area" has been further interpreted to mean Sonoma County.

52 *Dissenting Opinion, Agricultural Processing,* CAC Memo, Scott Briggs, Sonoma County PRMD, February 20, 2003.

Prime Farmland, Farmland of Statewide Importance, etc.) and 800,000 acres of County designated agricultural land would be available for agricultural use. Since these support uses would be critical to protect the future agricultural use of these lands, the loss of such a relatively small area would not significantly detract from future agricultural use in the unincorporated area.

However, one way to further reduce the extent of these uses on designated agricultural lands would be to require that a higher percentage of the product being processed is grown onsite or within the local area. If a more stringent requirement that 75 percent of the product being processed comes from the site or local area, the amount of processing and the amount of agricultural land lost would be reduced. Furthermore, such a policy would likely ensure that if agricultural land were developed for processing facilities, it would increase the support for Sonoma County farmers by encouraging the purchase of agricultural products grown within the county. This alternative policy is analyzed in ***Section 5.4 Alternative 3 – Mitigated Alternative***.

Mitigation Measure 4.8-2 None required.

Impact 4.8-3 Agricultural Tourism

Implementation of the Draft GP 2020 would result in the development of visitor-serving uses on agricultural lands and would therefore convert a portion of the county's agricultural lands to these uses. However, due to the limited acreage that would be lost as well as policies and programs contained in the Draft GP 2020 regulating such development, this would be a less-than-significant impact. ***(LTS)***

The agricultural tourism industry has grown in recent years as agricultural operations seek to utilize the added value of tourism uses in order to maintain long-term economic viability. While this type of development could be accommodated on lands designated Recreation and Visitor-Serving Commercial (RVSC), as discussed in the setting above, there are relatively few areas left in the unincorporated area where such new development could occur.

Goal **AR-6** of the Agricultural Resources Element would support the development of new visitor-serving uses and facilities on agricultural lands. Implemented by Policy **AR-6a,** the *Draft GP 2020* would allow various visitor-serving uses such as tasting rooms, bed and breakfasts, direct on-site sales, and others provided they are incidental and secondary to local agricultural production. While the intent of Section 2.6 of Agricultural Resources Element would be to limit these uses in size and intensity, this policy (similar to **AR-5a** which encourages agricultural processing uses) creates a tension between those policies that would promote the development of visitor-serving uses with those policies intended to assure that agricultural production remains the primary use of these lands.

The demand for visitor-serving uses would primarily affect agricultural lands designated Land Intensive Agriculture (LIA), Land Extensive Agriculture (LEA), and Diverse Agriculture (DA). The Agricultural and Residential (AR) and Resource and Rural Development (RRD) categories areas would also allow agricultural tourism uses, but at a more limited scale.

It is acknowledged that this type of development would have a beneficial economic impact on Sonoma County agriculture and therefore support the county's agricultural preservation efforts. However, the continued growth of this industry would still convert agricultural land to non-agricultural uses.

Additionally, development of visitor-serving uses on agricultural lands in unincorporated Sonoma County could generate land use conflicts with agricultural production on adjacent land. Land use conflicts resulting from this type of development are discussed in ***Section 4.1 Land Use, Population, and Housing***. Of special concern would be the concentration of such uses in close proximity to one

another (e.g., multiple events along the same transportation corridor on the same weekend) as conversion pressures would increase in locations where visitor-serving uses are clustered. Ultimately, this type of development, if unregulated, could threaten the long-term viability of Sonoma County agriculture.

Although any estimate of the total amount of visitor-serving development that could occur on agricultural land through 2020 would be speculative, it would be reasonable to expect a significant amount of such development would occur in support of projected winery development described in *Impact 4.8-2 Agricultural Processing*. Many winery projects include a tourism component. While the projections described in **Exhibit 4.8-4** do not differentiate between processing uses like wineries and visitor-serving uses such as tasting rooms and event centers, it would be reasonable to assume that visitor-serving uses would represent a portion of this development. Therefore, the development of visitor-serving uses on agricultural lands would result in the conversion of County and State designated agricultural lands and an associated loss of agricultural production.

However, Section 2.6 of the Agricultural Resources Element contains policies designed to limit the type, intensity, and location of such visitor-serving development on agricultural lands. Policy **AR-6a** would reduce impacts from visitor-serving uses on agricultural lands by allowing only those uses that promote agricultural production within the county and that are secondary and incidental to local agricultural production. Additionally, recreational uses, campsites of 30 or fewer sites, and bed and breakfast inns of five or fewer rooms would be not be allowed on agricultural lands designated Land Intensive Agriculture as these uses could result in a substantial loss of agricultural productivity and hinder the primary use of the land. These uses would be permitted on lands designated both Land Extensive Agriculture and Diverse Agriculture where the conflicts between visitors and agricultural practices would be less severe due to the greater amount of land available to separate the activities. Policy **AR-6b** would further reduce the impact of conversion by limiting the expansion or intensification of those restaurants and lodging facilities that have already been approved or exist.

Policy **AR-6c** would continue to prevent the application of non-agricultural land use categories to areas surrounded by agricultural land use categories for the purpose of permitting visitor-serving uses. This policy would support the preservation of interior agricultural areas thereby reducing the conversion of agricultural land to non-agricultural uses as well as steer tourism uses to more suitable locations within the Urban Service Area.

Policy **AR-6d** would limit conversion of agricultural lands through the application of specific guidelines for visitor-serving uses during the review of project applications. These include requirements that the use would promote agricultural products grown or processed in the local area and that the use be compatible and secondary or incidental to agricultural production. Additional criteria would include that the project not require the extension of urban services, be compatible with existing uses, and that lodging uses would not be included as part of the project. Implementation of this policy would prohibit the construction of hotels and resorts which could convert substantial amounts of agricultural land to a non-agricultural use. Finally, the policy would reduce the likelihood that projects would result in cumulative traffic impacts or operate at higher than permitted levels by requiring participation in a visitor tracking and event coordination program as condition of approval for qualified projects.

Policy **AR-6f** would further reduce potential cumulative impacts resulting from a concentration of visitor-serving uses within a given transportation corridor or localized area through the application of additional project screening criteria. Factors to be considered include whether the use would be inconsistent with or exceed service level objectives described in the Circulation and Transportation

Element, interfere with other area wells, exceed prescribed density limits, or detrimental to the county's rural character.

Policy **AR-6g** would require that compatible visitor-serving uses, their permissible sizes and intensities be defined in the zoning code. However, as the policy does not describe specifically how these uses would be regulated, it is unclear how effective it would be in reducing the conversion impact.

Accordingly, while these policies would do much to reduce this impact, development of visitor-serving uses would still occur on some portion of the county's productive agricultural land and these uses could have a substantial beneficial impact on the economic viability of Sonoma County agriculture. In the long-term, this economic viability would more effectively reduce conversion of farmland to non-agricultural use. Therefore, further limitations on visitor-serving uses through proposed mitigation measures may not be as effective in achieving project objectives and therefore may not be feasible. In addition, as mentioned in *Impact 4.8-2 Agricultural Processing and Support Uses*, the acreage of agricultural land that would likely be utilized for visitor-serving uses would be relatively small compared to the total agricultural land available under either the State or County designation. As long as the *Draft GP 2020* policies would be successful in avoiding the concentration of these uses, the impact of the loss of these lands would not be significant on a countywide scale. Therefore, this would be a less-than-significant impact.

Mitigation Measure 4.8-3 None required.

Impact 4.8-4 Timberland Conversion

Implementation of the Draft GP 2020 could result in the conversion of timberland to non-timber uses. However, the acreage of timberland converted to non-timber uses would be relatively small and would be a less-than-significant impact. ***(LTS)***

The conversion of timberland to agricultural, residential, and other non-timber uses is permitted under both the existing *General Plan* as well as the zoning code. Pursuant to State law, lands designated Timber Production Zones (TPZ) are effectively protected by tax provisions and restrictions on conversion to non-timber use. While this zoning has historically protected the county's conifer forests and oak woodlands, lands designated TPZ only comprise approximately 30 percent of the county's timberlands. The vast majority of the county's timberland lies within other land use categories which allow conversion to take place.

Despite the fact that less than one percent of the county's timberland has historically been converted to non-timber uses since the passage of the Forest Practice Act, there appears to be an increasing pressure to convert these lands to non-timber uses, primarily vineyards. As described in the setting section, nearly all of the large timber conversion requests in recent years have been to accommodate vineyard development. Through September 2004, the CDF had six timber conversions applications pending that, if approved, would result in the conversion of 369 additional acres to vineyards.

This recent increase in conversion requests suggests a trend that could threaten the county's timber base as these conversions effectively represent a permanent loss of timber productivity on lands on which they occur. In addition, the size of the conversion requests may be increasing. While vineyard

conversions have typically ranged in size from tens to hundreds of acres, one company recently considered a vineyard conversion of approximately 5,000 acres of timberland in the coastal area. [53]

Furthermore, the true inventory of timberlands available for harvesting may actually be less than the acreage suggests because not all owners of timberland seek to log their lands. Increased restrictions on logging near streams and other sensitive areas within timberlands may further limit the availability of timber as well. Also, if new vineyard development in the coastal timberlands proves successful, the demand for high quality wine grapes would likely lead to additional conversion requests. [54] In view of this developing trend and potential for significant loss of timber resources, the *Draft GP 2020* contains goals, objectives, and policies to preserve, sustain, and restore timber resources for their economic, conservation, recreation, and open space values (Goal **OSRC-12**). Adoption and implementation of these policies would reduce the extent of adverse environmental affects associated with timberland conversions.

Policy **OSRC-12e** relates specifically to the conversion of timberlands to other uses on lands designated RRD. This policy would revise the zoning districts which implement the RRD land use category to prohibit uses that result in the conversion of timberlands unless the request meets certain criteria. Conversions to agricultural and other uses would be permitted provided they qualified for a timber conversion exemption pursuant to the Forest Practices Rules, provide a significant public benefit (e.g., the construction of the Sea Ranch Reservoir), or result in no net loss of timberland. Furthermore, these exceptions would not be allowed if the conversion would result in habitat fragmentation. This policy, if adopted and implemented, would give greater protection to approximately 180,000 acres of the 230,000 acres of timberland in Sonoma County and would greatly reduce both the amount of conversion as well as the severity of associated impacts previously described. [55]

Policy **OSRC-12a** would apply the RRD category to include all lands within a Timber Production Zone. This policy would afford the protection of zoning regulations to timberlands which includes provisions for limited number of permitted uses (e.g., single family dwellings) at densities lower than 20 acres per unit. The RRD designation prioritizes the protection of natural resources and acknowledges significant constraints to development such as the lack of infrastructure, conflicts with resource conservation, and hazards.

Policies **OSRC-12b** through **12d** would implement a review and commenting process for Timber Harvest Plans (THPs). This would enable County staff to review timber harvest plans for compatibility with *GP 2020* policies and comment in support of increased protection of Class III streams, and in opposition to prevent clearcutting within riparian corridors. Specifically, Policy **OSRC-12d** would encourage the CDF to reduce clearcutting of timber within streamside conservation areas. If approved, this policy would encourage the retention of at least 50 percent of either the overstory canopy or the understory vegetation within the riparian corridor to mitigate the impacts to streams. While the ability of County staff to regulate timber harvest plans is limited, this policy would afford some additional protection to streams and riparian corridors when THPs are considered.

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53 *Company scales back plan for biggest vineyard on coast,* Tom Chorneau, Santa Rosa Press Democrat January 3, 2003

54 *Timber Conversions ,* CAC memo, David Schiltgen, Sonoma County PRMD, June 5, 2003.

55 *Timber Conversions ,* CAC memo, David Schiltgen, Sonoma County PRMD, June 5, 2003.

These policies, if adopted and implemented, would reduce the amount of timberland that would be permanently converted to non-timber uses. As previously noted, the total amount of timberlands converted would increase to 1,220 acres if all pending applications were approved. This amount represents approximately one half of one percent of Sonoma County's 230,000 acres of timberland, which does not represent a significant portion of Sonoma County timberlands. Therefore, this would be a less-than-significant impact and no mitigation would be required.

Mitigation Measure 4.8-4 None required.

4.9 PUBLIC SERVICES

4.9 PUBLIC SERVICES

This section addresses the following public services in the unincorporated area of Sonoma County;

- Water Supply Services
- Wastewater Management Services
- Solid Waste Management
- Parks and Recreation Services
- Public Education Services
- Fire Protection and Emergency Services
- Criminal Justice Services
- Library Services
- Human Services

Each topic is addressed separately, with the environmental and regulatory setting information preceding the impacts and mitigation measures for each topic. The topics discussed in this section overlap with other sections of this EIR, including ***Section 4.5 Hydrology and Water Resources*** and ***Section 4.8 Agricultural and Timber Resources***. Public service impacts are most closely related to the Land Use and Public Facilities and Services Elements of the *Draft GP 2020.*

Water Supply Services – Environmental Setting

WATER SOURCES

Potable, commercial, industrial and agricultural water supplies in Sonoma County are derived from a number of sources, including surface water, groundwater, and recycled water. Surface water sources are primarily used in the incorporated areas (cities) and are supplemented by groundwater. Residences in rural areas in the county tend to rely more on groundwater sources.

The California Department of Water Resources (DWR) has identified eleven major groundwater basins in Sonoma County. These basins are primarily located along major creek and river valleys in the southern portions of the county, and are described further in ***Section 4.5 Hydrology and Water Resources.*** [1]

The Russian River and Dry Creek (a tributary to the Russian River) are the principal sources of potable surface water supplies in Sonoma County. The Russian River originates in central Mendocino County, approximately 15 miles north of Ukiah, and drains an area of 1,485 square miles, including much of Sonoma and Mendocino Counties. The Russian River reaches the Pacific Ocean at Jenner, approximately 20 miles west of Santa Rosa. The main channel of the Russian River is approximately 110 miles long and has five principal tributaries: the East Fork of the Russian River, Big Sulphur Creek, Maacama Creek, Dry Creek and Mark West Creek.

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1 *California's Groundwater – Bulletin 118, Draft Update 2002,* California Department of Water Resources, Division of Planning and Local Assistance, Statewide Planning, first published 1975, draft update 2002.

Two major reservoirs provide water storage for the Russian River Basin: Lake Mendocino on the East Fork of the Russian River and Lake Sonoma on Dry Creek. Lake Mendocino provides water for agricultural, municipal, and industrial uses and Lake Sonoma provides water for municipal and industrial uses. Releases from both lakes maintain minimum streamflows required by the State Water Resources Control Board (SWRCB) for recreational uses and fish habitat. A portion of the summer streamflow in the Russian River is augmented by diversions from the Eel River via the Potter Valley Project, a hydroelectric plant owned and operated by the Pacific Gas and Electric Company. Water for the Potter Valley Project is stored in Lake Pillsbury on the Eel River.

SONOMA COUNTY WATER AGENCY [2] [3] [4] [5]

The Sonoma County Water Agency (SCWA) is a special district that was created by the California Legislature in 1949 and operates under the direction of a Board of Directors, composed of the members of the Sonoma County Board of Supervisors. The law that created the SCWA and defines its powers and duties gives it the authority to produce and furnish surface water and groundwater for beneficial uses, to control flood waters, to generate electricity, and to provide recreational facilities in connection with the SCWA's facilities. Legislation enacted in 1994 added the treatment and disposal of wastewater to the SCWA's powers and duties.

The SCWA is the local sponsor for the two federal water supply and flood control reservoir projects in the Russian River watershed. The SCWA releases water from Coyote Valley Dam (Lake Mendocino) and Warm Springs Dam (Lake Sonoma) for water supply purposes and to maintain required minimum streamflows in the Russian River and Dry Creek. The SCWA holds water right permits from the State Water Resources Control Board that authorize the SCWA to divert Russian River and Dry Creek flows and to re-divert water stored and released from Lake Mendocino and Lake Sonoma. [6]

The SCWA provides potable water to approximately 600,000 people in Sonoma and Marin Counties. Water is delivered, on a wholesale basis, to the SCWA's primary water customers through the SCWA's transmission system. The primary water customers, collectively known as the water contractors, consist of the cities of Santa Rosa, Rohnert Park, Petaluma, Cotati, and Sonoma, and the North Marin, Valley of the Moon, and the Forestville water districts. The SCWA supplies water to the water contractors under an agreement entitled "Eleventh Amended Agreement for Water Supply," which was originally executed in 1974 and most recently amended in 2001. The SCWA also provides water via the transmission system to other customers such as the Marin Municipal Water District, the Town of Windsor, and local water companies. The water contractors and other SCWA customers

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2 *Fifty Years of Caring for Sonoma County's Water Resources*, Sonoma County Water Agency, 1999.

3. *Urban Water Management Plan*, Sonoma County Water Agency, 2000.

4 *Notice of Preparation of an Environmental Impact Report for the Water Supply Transmission, and Reliability Project*, Sonoma County Water Agency, February 2005.

5 *Report to the State Water Resources Control Board on Water Conservation*, Sonoma County Water Agency, April 2005.

6 *Divert* refers to water diverted directly from streamflow into distribution systems or reservoirs. *Re-divert* refers to water that has been diverted to storage in a reservoir, then released and diverted again at a point downstream. Diversions and re-diversions by the Agency will be collectively referred to as *diversions* in this document.

deliver water to customers through their own distribution systems. In addition to water supplied by the SCWA, many of the contractors use other sources such as municipal groundwater wells.

Surface Water

The SCWA holds appropriative water rights from the SWRCB to store water in Lake Mendocino and Lake Sonoma and to divert and re-divert water from the Russian River at Wohler and Mirabel. The SCWA is required to maintain the minimum streamflows at various points on the Russian River and Dry Creek in accordance with its water right permits. The SCWA's current total authorized amount of diversion is 75,000 acre-feet per year (AFY).

Transmission System

The SCWA's existing water transmission system includes diversion facilities at the Russian River and an aqueduct system comprised of pipelines, pumps, and storage tanks. Diversion facilities are located near Wohler Bridge and Mirabel Park adjacent to the Russian River and include Ranney-type collector wells, conventional wells, an inflatable dam and associated fish ladders, infiltration ponds, and treatment facilities. The aqueduct system distributes the water produced from the diversion facilities to customers in the SCWA's service area. The transmission system includes approximately 85 miles of 16 to 48-inch diameter pipelines, 17 water storage tanks with a total capacity of 118.8 million gallons, and eight booster pump stations. The total capacity of the transmission system is 92 million gallons per day (mgd), with 20 mgd of standby capacity.

Groundwater

The SCWA operates three groundwater production wells in the Santa Rosa Plain that are also connected to the transmission system. The wells are located west of the City of Santa Rosa at Sebastopol Road, Occidental Road and Todd Road. These wells are an additional source of water for the SCWA, and are capable of producing approximately 4 to 6 mgd.

Adequacy of the SCWA's Water Supply

The SCWA has estimated that by 2020 it will need to divert an additional 25,000 to 30,000 acre feet of water annually from the Russian River at its Wohler-Mirabel diversion facilities, and release additional water from Lake Sonoma to support this additional diversion to supply projected increases in its contractors' demands. This additional diversion amount was estimated from the 2000 Urban Water Management Plans of the SCWA, Marin Municipal Water District, and the Town of Windsor and it includes reductions in demands resulting from projected water conservation savings and urban recycled water uses. The current and projected water supplies of the SCWA for multiple dry years, from both surface and groundwater supplies, are presented in **Exhibit 4.9.1**. A summary of current and projected water supply and demand for the SCWA's contractors is presented in **Exhibit 4.9.2**. The demand projections are based on the adopted general plans of the individual contractors for their service areas and the existing *General Plan*.

The SCWA has adequate supplies to meet the projected increases in demands. The SCWA is the local sponsor of the Coyote Valley Dam / Lake Mendocino Project and the Warm Springs Dam / Lake Sonoma Project, which together are known as the Russian River Project. The SCWA paid the U.S. Army Corps of Engineers approximately $5,000,000 (in 1955 dollars) for the water supply benefits of the Coyote Valley Dam Project, and the SCWA is paying the Corps of Engineers a total of almost $100,000,000 for the water supply benefits of the Warm Springs Dam Project. These amounts have

been and are being funded through property taxes paid by the residents of Sonoma County and through water charges paid by the customers of the North Marin and Marin Municipal Water Districts.

Both Lake Mendocino and Lake Sonoma have dedicated flood-control pools and water supply pools. The right to store water in the 70,000 AF water supply pool in Lake Mendocino is shared between the SCWA and the Mendocino County Russian River Flood Control and Water Conservation Improvement District under Water Right Permits 12947A and 12947B. The SCWA's right to store 212,000 AF of water in Lake Sonoma is authorized by the SCWA's Water Right Permit 16596.

Digital computer hydrologic models are used by the SCWA to analyze the adequacy of its surface water supplies. The computer models simulate the levels of diversions and operational criteria for the coordinated operation of Lake Mendocino and Lake Sonoma, the maintenance of minimum instream flows required by the SWRCB, the diversions from the Eel River into the Russian River, and various levels of demands by SCWA customers or other water users. Based on these hydrologic models, the estimated reliable water supply yield of the Russian River Project at the SCWA's Wohler-Mirabel diversion facilities is approximately 124,000 AFY. The SCWA's Russian River diversions in 2020 at Wohler-Mirabel are estimated to be between 85,000 and 90,000 AFY. Thus, the SCWA has adequate water supplies to meet its contractors' projected 2020 demands. [7]

Although the SCWA has an adequate water supply, there are uncertainties in terms of how the SCWA may be able to use its supply. In order to re-divert additional water released from storage in Lake Sonoma, the SCWA would need to obtain additional water rights from the SWRCB. In addition, the transmission system would need to be expanded to distribute the water to customers in the SCWA's service area.

In the early 1990s, the SCWA initiated a project to increase the amount of water released from Lake Sonoma and diverted from the Russian River and expand the transmission system. The Environmental Impact Report for the project was successfully challenged, and the SCWA is in the process of preparing a new EIR for the project (Water Project). The Water Project must undergo environmental review in accordance with the California Environmental Quality Act and project approval before it can proceed. Supply projections on **Exhibit 4.9.2** assume that the Water Project will be approved. **Exhibits 4.9.1** and **4.9.2** indicate that the SCWA generally has sufficient supplies to serve its water contractors through the year 2020. If the Water Project is not approved, this determination may change.

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[7] Because the Agency has the rights to store water in and has paid for the water supply benefits of these two reservoirs, the Agency is in a very different water supply situation than other water users in the Russian River watershed that have not developed adequate water supply facilities or do not have sufficient water rights.

Exhibit 4.9-1
Current and Projected SCWA Water Supplies (acre-feet per year)
Multiple Dry Year Hydrologic Results

Water Supply Source	***2000***	***2005***	***2010***	***2015***	***2020***
SCWA Groundwater	3,025	3,025	3,025	3,025	3,025
SCWA Surface Water	127,830	126,830	125,830	124,830	123,830
SCWA Supply Totals	*130,855*	*129,855*	*128,855*	*127,855*	*126,855*
SCWA Projected Demand	*60,692*	*70,070*	*79,960*	*82,744*	*84,791*
Surplus	***70,163***	***59,785***	***48,895***	***45,111***	***42,064***

Source: *Urban Water Management Plan,* Sonoma County Water Agency, 2000.

Diversions from the Eel River into the Russian River via Pacific Gas and Electric's Potter Valley Project are regulated by a number of agencies including the Federal Energy Regulatory Commission (FERC), and the National Oceanic and Atmospheric Administration - National Marine Fisheries Service (NOAA-NMFS). In 2004, FERC issued a final decision that reduced the amount of diversions from the Eel River into the Russian River by approximately 15 percent to protect Eel River fisheries. This decision formalized an interim decision that was made and implemented in 1999. Since the flow reductions were implemented in 1999, the SCWA has not experienced any difficulties in operating the Russian River Project for water supply purposes or in meeting minimum streamflow requirements. Although there is some uncertainty surrounding this issue because the FERC decision is being appealed, there are no additional proposed reductions pending before FERC.

Another uncertainty facing the SCWA's water supply is related to the recent listings of coho salmon, Chinook salmon, and steelhead as threatened under the federal Endangered Species Act. The SCWA's water supply operations and maintenance activities are undergoing review by NOAA-NMFS. This review is being conducted as part of an ongoing Section 7 consultation process under the federal Endangered Species Act. Changes to either the SCWA's water supply operations and maintenance activities or to required minimum streamflows resulting from the consultation process, may affect the ability of the SCWA to use or deliver its water supply.

Exhibit 4.9-2
Current and Projected Water Supplies for SCWA Water Contractors (acre-feet per year)

Water Contractor	Water Supply Source	2000	2005	2010	2015	2020
City of Santa Rosa	Purchased from SCWA	23,312	27,000	29,100	29,100	29,100
	Recycled Water	25	200	400	600	800
	Other	0	0	1,300	3,350	5,050
	Total Supply	*23,337*	*27,200*	*30,800*	*33,050*	*34,950*
	Total Demand	*23,255*	*27,200*	*30,800*	*33,050*	*34,950*
	Surplus	*82*	*0*	*0*	*0*	*0*
North Marin Water District [a]	Purchased from SCWA	8,942	11,029	11,896	12,707	12,682
	North Marin Surface Water	1,982	1,715	1,715	1,715	1,715
	Recycled Water	0	300	325	350	375
	Other	250	250	250	250	250
	Total Supply	*11,174*	*13,294*	*14,186*	*15,022*	*15,022*
	Total Demand	*11,174*	*13,294*	*14,186*	*15,022*	*15,022*
	Surplus	*0*	*0*	*0*	*0*	*0*
City of Petaluma	Purchased from SCWA	10,171	10,916	11,898	12,611	13,358
	Petaluma Groundwater	1,029	750	500	250	0
	Recycled Water	0	300	400	500	600
	Total Supply	*11,200*	*11,966*	*12,798*	*13,361*	*13,958*
	Total Demand	*11,200*	*11,966*	*12,798*	*13,361*	*13,958*
	Surplus	*0*	*0*	*0*	*0*	*0*
City of Rohnert Park	Purchased from SCWA	2,785	7,234	7,500	7,500	7,500
	Rohnert Park Groundwater	4,020	0	172	634	1,108
	Recycled Water	973	973	988	1,004	1,034
	Total Supply	*7,778*	*8,207*	*8,660*	*9,138*	*9,642*
	Total Demand	*7,778*	*8,207*	*8,660*	*9,138*	*9,642*
	Surplus	*0*	*0*	*0*	*0*	*0*
Valley of the Moon	Purchased from SCWA	2,784	3,200	3,200	3,200	3,200
	Valley of the Moon Groundwater	1,031	784	784	784	784
	Other	0	2	174	346	517
	Total Supply	*3,815*	*3,986*	*4,158*	*4,330*	*4,501*
	Total Demand	*3,815*	*3,986*	*4,158*	*4,330*	*4,501*
	Surplus	*0*	*0*	*0*	*0*	*0*

Water Contractor	*Water Supply Source*	*2000*	*2005*	*2010*	*2015*	*2020*
City of Sonoma	Purchased from SCWA	2,508	2,714	2,991	3,000	3,000
	Sonoma Groundwater	0	0	0	269	448
	Other	0	0	0	0	96
	Total Supply	*2,508*	*2,714*	*2,991*	*3,269*	*3,554*
	Total Demand	*2,392*	*2,714*	*2,991*	*3,269*	*3,554*
	Surplus	*116*	*0*	*0*	*0*	*0*
City of Cotati	Purchased from SCWA	769	806	1,471	1,520	1,520
	Cotati Groundwater	409	448	0	0	0
	Recycled Water	0	112	112	112	112
	Other	0	0	0	204	496
	Total Supply	*1,178*	*1,366*	*1,583*	*1,836*	*2,128*
	Total Demand	*1,178*	*1,366*	*1,583*	*1,836*	*2,128*
	Surplus	*0*	*0*	*0*	*0*	*0*
Forestville Water District	Purchased from SCWA	480	439	446	456	464
	Recycled Water	0	50	50	50	50
	Total Supply	*480*	*489*	*496*	*506*	*514*
	Total Demand	*480*	*489*	*496*	*506*	*514*
	Surplus	*0*	*0*	*0*	*0*	*0*

[a] North Marin Water District is not a water contractor to the SCWA; however, the district affects SCWA supplies.

Source: *Urban Water Management Plan,* Sonoma County Water Agency, 2000.

OTHER SCWA CUSTOMERS

In addition to the primary water customer contractors described above, SCWA has agreements to transmit or indirectly provide water to three other types of customers. The first group consists of the users, other than the primary water customers, which have direct connections to the Agency's transmission system. This group includes the Town of Windsor, community water supply systems for the Kenwood, Penngrove and the Larkfield-Wikiup-Airport areas, the Lawndale Mutual Water Company, and other water companies, parks and government users. Since these customers use small amounts of water on an infrequent, supplemental basis, it is not possible to accurately estimate demand.

A second type is the Marin Municipal Water District (MMWD), a large user which is connected to the south end of the SCWA transmission system. MMWD receives a portion of its water supply from the Agency pursuant to separate agreements and is not a signatory to the Agreement for Water Supply. To ensure that adequate capacity is included in the transmission system, MMWD's entitlement of 12.8 mgd is included in the total SCWA transmission system capacity needed for the future.

The third type of other SCWA customer is water suppliers who are authorized to divert water directly from the Russian River and report it under the Agency's water rights permits. This group includes the

Town of Windsor, City of Healdsburg, Russian River County Water District, and Camp Meeker Parks and Recreation District. The estimated based demand for Russian River water includes the maximum amounts specified in the Agency's contracts with these customers.

WATER SUPPLIES IN UNINCORPORATED AREAS

The main water sources for the unincorporated portions of the county are either groundwater or Russian River water from the SCWA as described above. Nearly all of the urban water providers have one or more wells which constitute the primary source for most of the smaller providers and a supplemental of backup source for the large providers primarily using Russian River water. Groundwater is the primary water source for all rural areas of the county, including many water systems for small communities, subdivisions and institutions. As a result of the amounts of both urban and rural development depending on groundwater, Sonoma County reportedly has the second largest number of public and private wells of any county in California. It is estimated that about 42 percent of the population's water supply comes from groundwater sources.

Following are the major water providers for unincorporated areas, their sources of water, and the unincorporated areas they serve.

City of Santa Rosa: The City provides water to some unincorporated users in the South Santa Rosa and Rincon Valley areas in the Santa Rosa USA. The City obtains the water from both the SCWA Russian River system and groundwater wells.

City of Petaluma: The City provides water to some unincorporated residential areas west of the City. The City's primary source is the SCWA system, but the wells are available for backup use.

Valley of the Moon Water District: The District provides water service to all unincorporated portions of the Sonoma Valley USA and some adjacent rural areas. The District obtains water from both the SCWA Russian River system and several wells.

Forestville Water District: The District serves the Forestville USA and extensive surrounding areas. The SCWA system is the District's water source.

Town of Windsor: The Town provides water outside Town limits to part of the unincorporated airport industrial area and USA to the south. Small amounts of water are obtained on an infrequent supplemental basis from a direct connection to the SCWA transmission system, but most of the Town's water is from wells adjacent to the Russian River and is considered to be diverted from the Russian River underflow pursuant to agreement with SCWA and reporting under SCWA water rights permits.

Cal-American Water Company: The Company serves most of the Airport-Larkfield-Wikiup USA. Most of the water provided is from wells, but small amounts of SCWA water are obtained on an infrequent supplemental basis from a connection to the SCWA transmission system.

Penngrove / Kenwood Water Company: The Company operates two community systems. The larger system serves the Penngrove USA, adjacent rural areas, and the Canon Manor West subdivision in the Cotati / Rohnert Park USA. The other system serves the rural community of Kenwood east of Santa Rosa. Most of the water provided is from wells, but Russian River water is also obtained from connections to the SCWA transmission system.

Camp Meeker Parks and Recreation Department: Several years ago, the existing district constructed a new water system for the rural community of Camp Meeker, supplied by a well installed beside the Russian River in Monte Rio. The District's extractions from the Russian River underflow are authorized and reported under SCWA's water rights permits.

Occidental Water Company: The Company serves the Occidental USA and adjacent users in the Coleman Valley Road area. The water source historically was wells, but the Company now has a connection to the Camp Meeker system described above.

Sweetwater Springs Water District: The District serves a large area which include all of the Guerneville and Monte Rio USAs and adjoining rural residential areas along the Russian River. The water is provided by several wells in the Russian River underflow.

Russian River County Water District: The Russian River Water District serves several rural residential areas along the Russian River. The source of water is wells beside the Russian River, with extractions authorized and reported under SCWA's water rights permits.

City of Sebastopol: The City provides water service to limited areas outside the City limits. The source of water is wells to the east of the City.

City of Cloverdale: The City provides water service to limited areas outside City limits. Several City wells supply the water.

Geyserville Water Works: The Company provides water from wells to the Geyserville USA.

Bodega Bay Public Utilities District: The District serves the Bodega Bay USA and the water provided is from several wells.

The Sea Ranch Water Company: The Company serves the Sea Ranch USA and most of the remaining Sea Ranch development. The water supply is wells beside the Gualala River using surface water rights.

Graton: The Graton USA has no community water service; water is provided by private wells and a few mutual water systems serving small subdivisions.

AGRICULTURAL WATER USE

With approximately 60,000 acres, or six percent of the county, in agricultural crop production, Sonoma County agriculture is a significant producer. However, most of the agricultural land in the county is used for dry farmed hay production or for grazing, and is not irrigated. Although some of the vineyards and orchards along the Russian River and Sonoma Creek are irrigated by surface diversions under riparian water rights, (with many vineyards served by small surface diversions and storage facilities), most vineyard acreage is irrigated at least partially by groundwater wells.

Estimates of agricultural water use can be derived from an inventory of crop acreage and the annual water demand of the crop, which varies widely by crop type. The water requirement of a crop is directly related to the water lost through evapotranspiration (ET). In turn, the amount of water that can be consumed through ET depends in the short-term on local weather conditions, such as temperature and humidity, and in the long-term on seasonal climatic conditions, such as rainfall totals and soil moisture storage. The Draft Update of the Department of Water Resources (DWR) *Bulletin 113, Crop*

Water Use in California, includes agricultural water-use estimates for Sonoma County. According to the report, approximately 105,900 acre-feet of water was used for agricultural irrigation in 2001, the latest date for which information is available. This report indicates agricultural water use is up about 25 percent from 1998. The fact that 2001 was a dry year is contributing to this increase. This estimate includes water derived from groundwater wells, surface diversions, and surface impoundments, and represents roughly 50 percent of the total estimated water use in Sonoma County. Some of the increased water use can likely be attributed to increased vineyard plantings. However, there can also be substantial differences in total agricultural water use over a period of years due to differences in climate (rainfall and summer temperatures). Water use estimates by crop are presented in **Exhibit 4.9-3**.

Exhibit 4.9-3
Agricultural Water Use

Year		*Vineyards*	*Total Crops*
1998	Acreage	37,400 acres	51,000 acres
	Applied Water	*34,100 acre-feet*	*74,800 acre-feet*
2000	Acreage	44,900 acres	57,600 acres
	Applied Water	*48,900 acre-feet*	*92,300 acre-feet*
2001	Acreage	47,300 acres	59,300 acres
	Applied Water	*55,600 acre-feet*	*105,900 acre-feet*

Source: Questa Engineering communication with Department of Water Resources - Central District, Land and Water Use Conservation Section, February 3, 2003.

ESTIMATED TOTAL WATER USE

Water supplies are derived from a variety of sources and distributed through several municipal and private distribution systems. The water use estimates for the various consumers in Sonoma County are presented in **Exhibit 4.9-4**.

Exhibit 4.9-4
Sonoma County Water Use Estimates – 2001

	Water Consumption ***(acre-feet)***	***Percent Consumption***
Sonoma County Water Agency [a]		
SCWA - Water Contractors [b]	44,000	24
SCWA - Other Users [c]	1,100	1
Agricultural Water Use [d]	105,900	58
Residential Wells [e]	32,000	17
Total	***183,000***	***100***

[a] Water consumption estimates do not include SCWA contractors and users outside of Sonoma County (i.e., North Marin Water District and Marin Municipal Water District).

[b] SCWA water contractors include the City of Santa Rosa, City of Petaluma, City of Rohnert Park, Valley of the Moon Water District, City of Sonoma, City of Cotati, and Forestville Water District.

[c] Other users that the SCWA has the obligation to provide water to include, the Town of Windsor, and various water companies.

[d] Agricultural water use estimates include water derived from both surface and groundwater sources.

[e] There are no available well water use estimates for Sonoma County. Therefore, as a rough approximation for comparison purposes, water use estimates assumed that 80 percent of the wells in the county were for residential purposes (80% of 40,000 wells = 32,000 wells) and that each of these wells uses an average of 1 acre-foot per year. It was assumed that most of the remaining 8,000 wells in the county are used for agricultural purposes, accounted for under the agricultural water use estimates.

Sources: *Urban Water Management Plan*, SCWA, 2000; and *Crop Water Use in California*, Draft Bulletin 113, Department of Water Resources.

Accurate water use data for all municipal, public, and community-owned water districts in Sonoma County are not available. However, a general idea of how water use has increased in the County over the last few years is provided by water use data derived from individual water companies and the State Department of Health Services (DHS). **Exhibit 4.9-5** shows water use data from 1998 through 2002 for most incorporated cities, suppliers for urban service areas, and large (more than 500 year-round residents) County- and community-operated systems. Note that not all of the cities, water districts, and private water companies in Sonoma County reliably report annual water usage.

FACTORS AFFECTING WATER SUPPLY

Water supply is a function of several variables. Physical conditions affecting water supply include climate (precipitation and evaporation), soil infiltration and soil permeability for groundwater recharge and runoff, topography, and hydrogeology (the capacity, locations, and quality of groundwater basins). In addition to physical resources and constraints, water use and management actions can greatly improve or deplete available supply. Conservation and reuse are examples of how applied water management can extend supplies. Poor water quality can also have a direct impact on water supply, making available water unusable. Additionally, the supply available for human uses is limited by the stream flow requirements of natural ecosystems.

SCWA WATER CONSERVATION PROGRAMS

Since 1982, the SCWA has employed fourteen water conservation Best Management Practices (BMPs) to assist SCWA water contractors with water. In a 1995 study entitled *Water and Wastewater Efficiency / Avoided Cost Study*, the SCWA analyzed the cost-effectiveness of various conservation measures that could be employed by each water contractor. The study was used to develop a Water Conservation Plan (WCP) that designates approximately $1.5 million annually (through 2007-2008) to assist water contractors in implementing cost-effective BMPs. BMPs that have been implemented through the plan include: high-efficiency washing machine and ultra-low flush toilet rebate programs, public information programs including water-wise gardening workshops, school education programs, system water audits (leak detection and repair), and conservation pricing. Because not all of these measures are quantifiable (e.g., educational programs, leak detection and repair), estimating the total water savings that have resulted from the implementation of water conservation measures is difficult. Target savings for the 1998 approved water conservation plan was 6,600 acre-feet / year. However, some of these measures are quantifiable (e.g., low-flow fixtures) and have been widely implemented. Water conservation programs for major municipalities in Sonoma County are shown in **Exhibit 4.9-6**.

WATER CONSERVATION PROGRAMS OF OTHER AGENCIES

Water conservation programs have also been initiated by some of the other public water suppliers in the County. In June and July 2005, PRMD staff contacted the three cities not supplied by SCWA (i.e., Cloverdale, Healdsburg, and Sebastopol) and several other suppliers. All of the agencies contacted have meters on water connections and show the water use on the bills. Flat rates for water use are most common, but some agencies have tiered pricing with higher rates for higher use levels. Several of the agencies have participated in short-term toilet replacement programs in the past. All of the agencies have been active in detecting and fixing leaky connections and some have performed system wide leak assessments and assisted users in assessing and repairing other leaks. All of the agencies have mailed out water conservation information to users, and some agencies have posted such information and / or related links on their websites.

Exhibit 4.9-5
Water Use Data for Major Water Suppliers in Sonoma County [a]

Water Company	Total Water Use in Million Gallons				
	1998	1999	2000	2001	2002
Urban Service Areas					
Sweetwater Springs Water District	340.1	347.8	356.2	353.9	370.3
Sea Ranch Water System	84.3	80.9	118.4	78.0	98.7
Bodega Bay Utility District	132.3	125.0	127.6	123.4	140.8
Occidental Community Services District [a]	9.7	10.6	7.7	8.6	-
Geyserville Water System	59.7	63.8	64.9	61.8	-
Forestville County Water District					
Cal-American - Larkfield [a]	361.6	410.2	435.8	425.0	-
Penngrove Water Company	7.9	7.7	8.5	8.3	9.2
Valley of the Moon Water District		1166.0	1125.0	1342.0	
Incorporated Cities and Water Districts					
Cotati		345.0	404.0		
Rohnert Park		2508.0	2389.0	2432.0	
Santa Rosa		7471.0		7817.0	
Healdsburg	755.0	828.0	812.0	866.0	
Petaluma	3314.9	3371.0	3453.8	3399.7	2955.2
Windsor	1057.0	1256.0	1326.0	1405.0	
Cloverdale					
Sebastopol	431.2				
County-Operated Community Systems					
Fitch Mountain (purchased from Healdsburg)	24.3	25.7	27.6	40.1	-
Freestone	2.1	2.1	2.5	2.3	-
Jenner	6.2	5.6	6.1	6.3	-
Salmon Creek	3.5	3.4	3.1	2.9	-
Other Community Systems					
Camp Meeker				18.9	19.4
Sereno Del Mar Water Company			4.1	3.7	4.4
Rains Creek Water District				15.2	15.2
Heights Mutual Water Company			29.6		29.8

[a] Water usage for some years was not available. Although this exhibit is incomplete, it represents the best approximation of total water use by major water suppliers in the County.

Source: *Annual Water System Reports,* Department of Health Services, Drinking Water Fields Operation Branch, and Questa Engineering.

Exhibit 4.9-6
Activity Profile of Water Conservation Measures Implemented by SCWA Water Contractors

BMP No.	Water Conservation Measure / Program	Cotati	Forestville Water District	Petaluma	Rohnert Park	Santa Rosa	Sonoma	North Marin Water District [a]	Valley of the Moon	Marin Municipal Water District [a]	Windsor
1	Residential Surveys-Inside & Outside										
	Single-Family									x	
	Multi-Family									x	
	Residential Surveys - Inside Only					x					
2	Residential Plumbing Retrofit	x	x	x	x	x	x	x	x	x	x
3	Leak Detection Repair										
	Unaccounted for Water 10%	x	x	x		x	x	x	x	x	x
	System wide Audit Performed		x	x		x		x	x	x	
4	Metered Water Sales	x	x	x	x	x	x	x	x	x	x
5	Large Landscape Program										
	Assign Evapotranspiration Budgets to Irrigation Meters					x		x			
	Tracking Feedback (w/ water bills)					x		x			
	Large Landscape Surveys			x		x	x	x		x	
	Training for Landscape Professionals		x	x		x	x	x		x	
6	Washing Machine Rebates										
	Energy Utility Rebate	x	x	x	x	x	x	x	x	x	x
	Water Agency Rebate	x	x	x	x	x	x	x	x	x	x
7	Public Information										
	Comparative Water Use on Bill			x		x	x	x	x	x	x
	Bill Stuffers and Offers	x	x	x	x	x	x	x	x	x	x
	Handouts	x	x	x	x	x	x	x	x	x	x
	Speakers and Displays	x	x	x	x	x	x	x	x	x	x
	Evapotranspiration Hotline			x		x	x	x	x	x	
	Internet Water Conservation Info			x	x	x	x	x		x	x
	Public Service Announcements			x	x	x		x		x	
	Paid or Co-op Advertising			x	x	x	x	x		x	
	Media Events			x		x		x		x	
	Contests	x		x	x	x		x		x	
	Recognition & Award Programs					x				x	
8	School Education Program										
	K-1, 2-3, and 4-6	x	x	x	x	x	x	x	x	x	x
	7-8 and High School										

BMP No.	*Water Conservation Measure / Program*	*Cotati*	*Forestville Water District*	*Petaluma*	*Rohnert Park*	*Santa Rosa*	*Sonoma*	*North Marin Water District* [a]	*Valley of the Moon*	*Marin Municipal Water District* [a]	*Windsor*
9	Commercial, Industrial, and Institutional										
	CULFT Replacement on Resale of Property [b]							x		x	
	CULFT Rebates [b]	x		x	x	x				x	
	CULFT Direct Installation Program [b]			x	x					x	
	Survey and Incentive Programs			x		x				x	
	Sanitation Fixture Surveys					x					
	Coin Operated Rate/Incentives					x					
10	Wholesale Agency (SCWA) Assistance	x	x	x	x	x	x	x	x	N/A	x
11	Conservation Pricing										
	Uniform Commodity Rate	x	x	x		x		x	x		
	Tiered Conservation Rate						x			x	x
12	Conservation Co-coordinator [c]	O	C	C	C	O	O/C	C	O/C	O	O
13	Water Waste Prohibition	x	x	x	x	x	x	x	x	x	x
14	Residential ULFT Replacement Program										
	Replacement at Sale of Property							x		x	
	Rebates	x		x	x	x	x	x	x	x	
	Give-Away Events			x	x	x	x		x	x	
	ULFT Direct-Install [3]				x						
Percentage of SCWA Deliveries in 1998-99		*1%*	*1%*	*16%*	*5%*	*39%*	*4%*	*13%*	*5%*	*13%*	*1%*

[a] Although the Marin Municipal Water District and North Marin Water District are not located in Sonoma County, they are SCWA water contractors.

[b] CULFT = Commercial Ultra-Low Flush Toilet.

[c] O = water contractor has own conservation coordinator.
C = water contractor contracts with the SCWA for water conservation coordinator service.
O/C = collaborative effort of local utility staff and contract SCWA staff.

[d] ULFT = Ultra-Low Flush Toilet.

Source: *Urban Water Management Plan*, Appendix F, SCWA, 2000.

RECYCLED WATER AND REUSE

The use of recycled water for irrigation in urban areas has the potential to reduce peak summer demands and reduce the need for construction of additional supply sources and potable water storage facilities. Recycled water is wastewater that has undergone primary, secondary, and occasionally tertiary treatment. During primary treatment, large solids are removed; during secondary treatment, bacteria is used to remove approximately 90 to 95 percent of the remaining solids and disinfectant is used to destroy bacteria, viruses, and other pathogens; during tertiary treatment, required for many reuse applications, filtration or reverse osmosis makes the water suitable for most non-drinking purposes. Potential irrigation sites for recycled water include schools, business parks, community parks, golf courses, and agricultural land. The potential water reuse within SCWA's service area was analyzed in the *1999 Preliminary Assessment of Urban Water Reuse*, prepared by the SCWA. The results of the assessment indicate that the use of recycled water for irrigation in SCWA water contractors' service areas could reduce the consumption of approximately 4,200 acre-feet of potable water per year. This represents less than ten percent of current total water use. **Exhibit 4.9-7** shows current and projected recycled water and reuse for several SCWA contractors.

Exhibit 4.9-7
Recycled Water: Current / Projected Reuse

Treatment System	*Total Current Reuse (acre-feet per year)*	*Current Nonurban Reuse (acre-feet per year)*	*Current Urban Reuse (acre-feet per year)*	*Add'l Projected Urban Reuse [a] (acre-feet per year)*
City of Santa Rosa Sub-regional Wastewater Treatment System	10,127	9,520	607	2,250
Novato Sanitary District [b]	1,841	1,841	0	650
City of Petaluma	254	254	0	640
Sonoma Valley County Sanitation District	1,200	1,200	0	610
Healdsburg & Windsor Forestville County Sanitation District	34	34	0	50

[a] Additional Projected Urban Reuse is based on recycled water projections of proposed reuse projects.

[b] Although Novato Sanitary District is in Marin County, the district provides services to the North Marin Water District, which is a SCWA water contractor.

Sources: *Urban Water Management Plan 2000*, Sonoma County Water Agency, 2000.

Water Supply Services – Regulatory Setting

Beneficial uses and water quality objectives for surface water and groundwater resources are protected by a number of federal, State, and local governments. The California Code of Regulations, Section 65302 (Land Use), requires a city or county General Plan to address water supply as a topical issue using an Urban Water Management Plan as a primary source document. Programs and regulations

related to drinking water quality, water supply, and wastewater treatment and disposal are described below.

LOCAL REGULATIONS

Sonoma County General Plan

Acquisition of land for and construction of water supply facilities in the unincorporated area is subject to County review for consistency with the Sonoma County General Plan under Section 65402 of the Government Code. While many public agency sponsors will strive to develop facilities that are consistent with the General Plan, they have the authority to override the County's determination and proceed with acquisition and construction.

Sonoma County Code of Regulations

The Sonoma County Code, including various ordinances, provides the regulatory framework for implementing the County General Plan policies and programs. The Sonoma County Code includes provisions covering well permitting and construction, water conservation and landscape water usages, stormwater quality management, and the design and construction of on-site wastewater disposal systems, such as septic tank and leachfield systems.

Sonoma County Permit and Resource Management Department

There are roughly 40,000 individual water wells within Sonoma County. The Permit and Resource Management Department (PRMD) is responsible for granting groundwater well permits in unincorporated areas of the county. The well permitting process varies depending on the availability of groundwater at the location of the proposed well. As discussed in ***Section 4.5 Hydrology and Water Resources,*** a four-tier classification system is used to indicate general areas of groundwater availability: *Class I* includes the Major Groundwater Basins; *Class II* includes the Major Natural Recharge Areas; *Class III* includes the Marginal Groundwater Availability Areas; *Class IV* includes Areas with Low or Highly Variable Water Yield. Wells located in incorporated areas are often permitted by the corresponding City governments. The well permitting process for incorporated areas is dependent on City ordinances and varies throughout the county. The County does not have any jurisdiction over wells within the boundaries of most incorporated cities.

Currently, the PRMD grants nondiscretionary (ministerial) permits to non-agricultural wells located within Class I and Class II areas, provided that wells are constructed according to minimum State and County standards. For proposed non-agricultural wells located in Class III and Class IV areas, applicants are required to provide proof of adequate groundwater to meet proposed domestic or commercial uses by means of a geologic report. Test wells or the establishment of community water systems are mandatory in Class IV areas and are sometimes required in Class III areas. Provided they meet certain minimum County and State standards for construction, agricultural well permits are granted, generally without further technical review. However, agricultural well permits may be associated with other aspects of an agriculturally related project, such as a processing or visitor-serving use. Such uses are typically subject to discretionary project review and the permit approval process, including the review of the proposed well construction and operational details. Discretionary permits are not granted unless the geologic report establishes that groundwater supplies in the vicinity of the proposed well are adequate and will not be adversely impacted by anticipated future land uses and development.

While the standards for groundwater well permits in a given groundwater availability area govern their physical design and provide some restrictions on the location of wells, they do not control the use or quantity of water extracted, nor do they currently address the sustainable capacity of the underlying aquifer to supply groundwater. Detailed procedures for determining potential well interference effects (the interference of a proposed well on the pumping rate, drawdown, or long term supply of an adjacent well) are also not contained in the current County Code. These issues may be addressed during the CEQA review process for those projects which are subject to CEQA, particularly for projects in water scarce areas.

STATE REGULATIONS

California Code of Regulations

The California Code of Regulations Section 100-112 (Water Code) outlines the general State authority and responsibilities over water in California. It establishes the Department of Water Resources as the primary research and supply development and management agency for water, the State Water Resources Control Board for overall water quality policy development and for dealing with water rights issues, and nine Regional Water Quality Control Boards for regulation, enforcement, and protection of the beneficial uses of water.

Porter-Cologne Water Quality Control Act of 1969

The 1969 *Porter-Cologne Water Quality Control Act* established the State Water Resources Control Board (SWRCB) and the nine Regional Water Quality Control Boards (RWQCBs) as the primary State agencies with regulatory authority over water quality. Under the act, the SWRCB has the ultimate authority over State water rights and water quality policy, and the RWQCBs are responsible for overseeing water quality on a day-to-day basis at the local / regional level.

Surface Water Rights

The SWRCB has jurisdiction over all water rights in the State of California under the common law public trust doctrine. The *California Water Code* Section 1735 provides the regulatory framework for long-term transfers, subject to the requirements of CEQA.

Appropriative water rights allow the diversion of surface water for beneficial use. Prior to 1914, appropriative water rights involved a simple posting to describe intent and scope of water use, diversion, or construction of diversion activities. Since 1914, the sole method for obtaining appropriative water rights is to file an application with the SWRCB. Before it can issue a water rights permit, the SWRCB must demonstrate the availability of unappropriated water. Both pre- and post-1914 appropriative water rights may be lost if the water has gone unused for a period of five years.

Riparian water rights apply only to lands that are traversed by or border on a natural watercourse. Riparian owners have a right (correlative with the right of each other riparian owner) to share in the reasonable beneficial use of the natural flow of water that passes the owners land. No permit is required for such use. Riparian water must be used reasonably, beneficially, and solely on riparian (adjacent) land and cannot be stored for later use. [8]

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[8] Information pertaining to Water Rights in California, State Water Resources Control Board, June 2005. Accessed online at http://www.waterrights.ca.gov/application/forms/infobook.htm#_Toc442697734

Groundwater Rights

The State requires that counties enact regulations covering well design to protect groundwater quality from surface contamination, and to ensure proper well construction and development for domestic use. However, these regulations are not related to the quantity of water extracted. Counties can also enact an ordinance to ensure that wells developed on one property do not interfere with the use of adjacent wells.[9] In some areas of over use, and where there is a high dependence on groundwater, groundwater rights are determined judicially in what are termed *adjudicated groundwater basins*. There are no adjudicated groundwater basins in Sonoma County**.**

Water Supply Regulations

There are two principal laws in California regarding planning for water supply and ensuring adequate water availability for new planned and approved growth.

The *Urban Water Management Planning Act* requires that each urban water supplier that provides water for municipal purposes to 3,000 or more customers, or to more than 3,000 acre-feet per year, must submit to the DWR an Urban Water Management Plan (UWMP). The UWMP must summarize existing and planned sources of water supply, current and projected water usage or demand, and include a discussion of 14 specified demand management (e.g., water conservation) measures. The *Agricultural Water Conservation and Management Act* establishes a relationship between the DWR and agricultural water suppliers to develop and implement efficient water management practices. In Sonoma County, there are no large water suppliers (e.g., irrigation districts) that supply water primarily to agricultural customers; the SCWA UWMP provides for urban users that are customers of the agency.

New legislation took effect in January 2002 that requires an increased effort to identify and assess the reliability of anticipated water supplies and envisions an increased level of communication between municipal planning authorities and local water suppliers.

SB 221 requires that cities and counties impose a new condition of tentative subdivision approval, requiring that the applicant provide a detailed verification from the applicable water supplier that a sufficient water supply will be available before the final subdivision map can be approved. It applies to subdivisions of 500 units or more and projects that would employ 1,000 or more workers. This requirement also applies to increases of ten percent or more of service connections for public water systems with less than 500 service connections. The law defines criteria for determining *sufficient water supply* such as using normal, single-dry, and multiple-dry year hydrology and identifying the amount of water that the supplier can reasonably rely on to meet existing and future planned uses. Rights to extract additional groundwater, if used for the project, must be substantiated.

SB 610 amends the Urban Water Management Planning Act to require additional information in Urban Water Management Plans if groundwater is identified as a source available to the supplier. The information required includes a copy of any groundwater management plan adopted by the supplier, a copy of the adjudication order or decree for adjudicated basins, and if non-adjudicated, whether the basin has been identified as being overdrafted or projected to be overdrafted in the most current California Department of Water Resources (DWR) publication on that basin. If the basin is in overdraft, that plan must include current efforts to eliminate any long-term overdraft. A key provision

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9 California Water Code section 10753.

in SB 610 assures that water supply issues are thoroughly considered as part of the environmental review process, but only for the larger projects as described above. These projects must include a water supply assessment, containing specified information from the local public water supplier likely to provide water in the project area. [10] It is unlikely that projects of this magnitude would occur in the unincorporated area due to the limitations of the land use plan and the relatively small size of the communities served by public water suppliers. However, Rohnert Park recently completed a Master Water Supply Assessment for future development under its General Plan.

AB 901 requires Urban Water Management Plans to include information relating to the quality of existing sources of water available to an urban water supplier over given time periods and the manner in which water quality affects water management strategies and supply.

It would be unlikely that any land use or development associated with the adoption of the *Draft GP 2020* would be of a sufficient size in the unincorporated areas of the county to trigger the provisions of SB 610 or SB 221.

Groundwater Management Plans

The 1993 *Groundwater Management Act* (California Water Code Section 10750), commonly referred to as AB 3030, was designed to provide local public agencies in California with increased management authority over groundwater resources. AB 3030 was developed in response to the federal Environmental Protection Agency's Comprehensive State Groundwater Protection Programs. [11] AB 3030 allows, but does not require, local water providers to develop a groundwater management plan for DWR-defined groundwater basins. Cities and counties may cooperate with these providers. [12] The plan can cover groundwater quantity management, groundwater quality management, or both. Once the plan has been adopted, rules and regulations must also be developed to implement the groundwater management program called for in the plan. Currently, no groundwater management plans have been adopted for any basins in Sonoma County. However, the SCWA has initiated studies of groundwater conditions in two Sonoma County Basins; Sonoma Valley and Alexander Valley in cooperation with the USGS. The regulatory setting for groundwater management is discussed in greater detail in ***Section 4.5 Hydrology and Water Resources***.

State Drinking Water Quality Regulations

The State Department of Health Services (DHS) is responsible for regulating Public Water Systems and Small Water Systems and monitoring them for compliance with the State water code and national standards for drinking water quality. *Public Water Systems* are defined as systems that provide water to 15 or more service connections or regularly serve at least 25 individuals daily at least 60 days of the year. The SCWA and its water contractors are examples of Public Water Systems. *Small Water Systems* serve at least five but not more than 14 connections and do not regularly serve drinking water to more than an average of 25 individuals daily for more than 60 days out of the year. The DHS is

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10 *Impact of New Water Laws on Development in California,* David Lanferman, Shepard Mullin Richter & Hamilton LLP, January 29, 2002, http://www.smrh.com/publication/pubview.cfm?pubID=160.

11 *General Groundwater Information,* California Department of Water Resources, Division of Planning and Local Assistance, Northern District, accessed online at http://wwwdpla.water.ca , December 2002.

12 California Water Code sections 10750.7 and .8.

responsible for the issuance of operational permits, routine water system inspections, evaluation of water quality monitoring data, and follow-up compliance activities.

FEDERAL REGULATIONS

The federal government sets minimum standards for the protection of water quality, including for drinking water and environmental protection, and has jurisdiction over flow in some waters where rivers or streams cross state boundaries. It has built and maintains several large water supply and irrigation projects in California. The federal government also has a voice in water management through its jurisdiction over energy regulation (for hydroelectric projects), and where endangered fish and aquatic species occur within a water body (see ***Section 4.6 Biological Resources*** for a discussion of the Federal Endangered Species Act).

Safe Drinking Water Act

Drinking water quality is based on two general standards: (1) organic and inorganic water contaminants that may have detrimental effects on health and safety, and (2) aesthetic qualities of water that may make water unpalatable or unpleasant to customers. The *Safe Drinking Water Act* of 1974 establishes the U.S. EPA as the primary government entity with responsibility for setting national drinking water standards for public water systems. Since 1974, the EPA has set national water quality standards for over 80 contaminants in drinking water. The *National Primary Drinking Water Standards* establish the maximum allowable contaminant levels (MCLs) allowed in public distribution systems. The *National Secondary Drinking Water Standards* establishes the MCLs that apply to potable water supplies at the point of delivery to the customer. While the U.S. EPA and state governments enforce water quality standards, local governments and private water suppliers are ultimately responsible for the quality of water supplies.

Water Supply Services – Significance Criteria

According to the *State CEQA Guidelines*, the project would have a significant water supply services impact if it would:

- Have insufficient water supplies available to serve the project from existing entitlements and resources, or require new or expanded entitlements; or

- Require or result in the construction of new water treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects.

Water Supply Services – Impacts and Mitigation Measures

Impact 4.9-1 Insufficient Water Supplies to Meet the Future Water Demand of the Urban Service Areas

Land uses and development consistent with the Draft GP 2020 would increase the demand for water. As a result, insufficient water supplies would be available to serve some of the unincorporated USAs from existing entitlements. New or expanded entitlements would be required. This would be a significant impact. ***(S)***

Sonoma County's surface water and groundwater supplies are finite but renewable. The long-term sustainability of these supplies is dependent upon both natural conditions (e.g., climate, soil permeability, topography and hydrogeology) and water supply management practices aimed at the distribution, conservation, reuse, and enhancement of supplies. Increases in water demand that would occur under the *Draft GP 2020* would be determined by future water use and management practices and the intensity and distribution of future land uses. Although both water supply and water demand vary over time, the long-term objective is to ensure that these two variables are held in balance, and that demand does not exceed supply for a prolonged period of time.

Provision of adequate supplies of urban water in Sonoma County is largely the responsibility of public sector water suppliers and private water companies that are not under the jurisdiction of the County. These suppliers must not only maintain supplies and facilities to serve existing water users, but also must expand supplies and facilities needed to accommodate planned growth within each service area. It is not always possible to assure adequate supplies and facilities fifteen or twenty years in advance of growth due to funding limitations, permitting and environmental entitlements, and competing water users. As a result, this analysis of the adequacy of future water supplies is based upon whether or not there is a reasonable likelihood that public water suppliers will be able to successfully bring future water supplies on-line where it is necessary to serve their respective districts.

As discussed in the setting section, the SCWA serves as a water wholesaler to the major cities and larger water districts in the county. The SCWA's water supplies are derived primarily from high capacity surface wells along the Russian River. These wells are recharged by flow in the adjacent Russian River. Inflows to Lake Mendocino are in turn supplemented by diversions from the Eel River. Many of the SCWA's water contractors supplement this supply with groundwater and surface water sources. In the unincorporated portions of the county, water supplies are almost entirely derived from groundwater via private groundwater wells and smaller municipalities and water districts that draw their supplies from local groundwater sources.

The SCWA has determined that the capacity of its water transmission system is constrained in meeting existing contract commitments for some contractors during summer months. Efforts to build additional collection and transmission facilities and secure additional Russian River diversions from Lake Sonoma have been initiated. If approved, the Water Project would increase Russian River diversions from 75,000 to 101,000 acre-feet per year. If the project is not approved, the SCWA would be unable to meet the future demands of SCWA water contractors. However, it is estimated that only about five percent of the proposed increased diversions would be allotted to the unincorporated portion of Sonoma County. The majority of water from the proposed increased diversion of Russian River would be used to serve the incorporated cities.

As indicated in **Exhibit 4.9-8**, six of the 12 unincorporated USAs are deemed to have *significant concerns* with regards to the ability of their respective water supplies to meet future demand. Significant concerns means that they currently lack the capacity to serve projected growth and would

be likely to experience significant difficulties in expanding the system to meet projected demand. Two of the unincorporated USAs are deemed to be *adequate with concerns,* meaning that the provider either has the capacity to serve projected growth or would be likely to solve capacity issues within the time horizon of the *GP 2020*. Some of the service providers have concerns related to infrastructure constraints related to the ability to store and convey available or allocated water to serve the projected demand. In some of the unincorporated USAs, the availability of additional water supplies to serve land uses and development consistent with the *Draft GP 2020* would depend on the proposed increased diversion from the Russian River by the SCWA. As previously discussed, this diversion has not completed environmental review and has not yet been approved. [13] In some of the unincorporated USAs, there are concerns that adequate water supplies cannot be achieved through sustainable groundwater management, that is, without creating declining groundwater levels, and adversely affecting existing wells.

Such concerns are heightened by the fact that most of these areas are presently dependent upon groundwater supplies and reliable information on current groundwater supplies for much of Sonoma County is not yet available. The following district by district analysis relies upon PRMD staff studies conducted in coordination with the applicable public water suppliers. Only those districts with significant concerns are discussed in greater detail below. [14]

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[13] The majority of USAs in the unincorporated area do not purchase water from the SCWA

[14] For a more thorough discussion of this issue see *Water and Sewer Capacities Final Report*, Richard Rogers, Sonoma County PRMD, October 16, 2003.

Exhibit 4.9-8
Summary of Water Supply and Sewer Capacity for Unincorporated Sonoma County

Area / Service	Facilities Adequacy to Serve Growth Allowed by General Plan Land Use Map			
	More than Adequate [a]	Adequate [b]	Adequate with Concerns [c]	Significant Concerns [d]
Bodega Bay Urban Service Area				
Water: Bodega Bay Public Utilities District		X		
Sewer: Bodega Bay Public Utilities District		X		
Sea Ranch Urban Service Area				
Water: Sea Ranch Water System		X		
Sewer: Sea Ranch Sanitation Zone		X		
Occidental Urban Service Area				
Water: Occidental Water Company				X
Sewer: Occidental County Sanitation District				X
Geyserville Urban Service Area				
Water: Geyserville Water Works				X
Sewer: Geyserville Sanitation Zone				X
Forestville Urban Service Area				
Water: Forestville Water District	X			
Sewer: Forestville Sewer Service Zone		X		
Russian River Urban Service Area				
Water: Sweetwater Springs Water District				X
Sewer: Russian River County Sanitation District			X	
Monte Rio Urban Service Area				
Water: Sweetwater Springs Water District				X
Sewer: approved, not constructed	n/a			
South Santa Rosa Urban Service Area				
Water: City of Santa Rosa			X	
Sewer: South Park County Sanitation District			X	
Airport/Larkfield/Wikiup Urban Service Area				
Water: Town of Windsor; California American				X
Sewer: Airport/Larkfield/Wikiup Sanitation Zone				X
Graton Urban Service Area				
Water: Wells		X		
Sewer: Graton Community Services District			X	
Penngrove Urban Service Area				
Water: Penngrove Water Company			X	
Sewer: Penngrove Sanitation Zone		X		
Sonoma Valley Urban Service Area				
Water: Valley of the Moon Water District				X
Sewer: Sonoma Valley County Sanitation District				X

[a] *"More Than Adequate"* means that facilities appear capable of serving growth beyond buildout the General Plan.

[b] *"Adequate"* means: (1) apparent capacity to serve buildout growth with little financial, technical or environmental difficulty; and (2) clear capacity to serve projected growth.

[c] *"Adequate with Concerns"* means that the provider either has the capacity to serve projected growth or is likely to solve capacity issues within the time horizon of the General Plan.

[d] *"Significant Concerns"* means that the provider lacks capacity to serve projected growth and is likely to experience significant difficulties in expanding the system to meet projected demand.

Source: *Water and Sewer Capacities: Final Report,* CAC memo, Sonoma County PRMD, October 16, 2003.

The Occidental USA is served by the Occidental Water Company. There currently is not an adequate supply for fire flow and very little capacity for new hook ups. The major problem appears to be infrastructure, not available water supply. Future land uses and development consistent with the *Draft GP 2020* could not be served by the existing infrastructure.

Within the Geyserville USA, water service is provided by the Geyserville Water Works. The existing system has little additional capacity available to serve even a modest amount of new demand. Similar to the Occidental USA, the problem is primarily one of a lack of infrastructure rather than the availability of water supply. However, a new well would be required to meet the increased demand of future land uses and development consistent with the *Draft GP 2020* .

The Russian River USA and the community of Monte Rio are served by the Sweetwater Springs Water District. The District currently receives nearly all of its allocated water from diversions of underflow of the Russian River. The District would need to obtain additional water rights and / or and implement an aggressive water conservation and recycling program as well as reduce system losses in order to meet the increased demand resulting from implementation of the *Draft GP 2020*. Obtaining new water rights along the Russian River may be problematic due to environmental issues associated with Russian River fisheries.

Within the Airport-Larkfield-Wikiup USA, the California American (CA) Water Company provides water service primarily to residential uses in the Larkfield-Wikiup area. Under an agreement with the County, the Town of Windsor supplies the majority of water supplies to commercial and industrial uses located within the Airport Industrial Park area. The Town of Windsor obtains its water from four municipal wells in addition to contracting for water from the SCWA. The CA also obtains its water supply from wells and from the SCWA. Neither the Town of Windsor nor the CA currently has enough supplies to meet the proposed demand resulting from implementation of the *Draft GP 2020*. The Town of Windsor and the CA would require additional wells and / or obtain additional water from the SCWA to meet this demand. The Town could also divert Russian River water under SCWA water rights. Again, because the ability of the SCWA to supply additional water in order meet this demand is uncertain, this would remain an area of concern.

Within the Penngrove USA, water service is provided by the Penngrove Water Company (PWC). The PWC obtains its water from a high capacity well and from the SCWA. Water delivery by the SCWA is presently constrained by the transmission system which could be remedied by the implementation of the Water Project. [15] However the PWC would need to rely on its well to meet the demand of land uses and development consistent with the *Draft GP 2020*. While water levels had declined in this area due in part to pumping by the City of Rohnert Park, the City's increased use of SCWA water has reversed this condition in recent years. The long-term sustainability of groundwater use in this area would depend on both the ability of the City of Rohnert Park to obtain additional water supplies (as a SCWA contractor) as well as the success of its water conservation programs.

Water is provided within the unincorporated southern portion of the Santa Rosa USA by the City of Santa Rosa. The City of Santa Rosa obtains its water from the SCWA with supplemental supply from municipal wells. A large portion of this USA may eventually be annexed into the City of Santa Rosa prior to 2020. The City of Santa Rosa would need to obtain additional water supplies to meet the increased water demand resulting from implementation of the *Draft GP 2020.* As some of this additional water would likely come from the SCWA's proposal for increased Russian River

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15 The Water Supply and Transmission System Project (WTSP) is discussed in the environmental setting.

diversions, the ability of the City of Santa Rosa to provide adequate water supplies to future development in this unincorporated USA is an area of concern.

The majority of the unincorporated Sonoma Valley USA is served by the Valley of the Moon Water District (VOMWD). The water supplies of the VOMWD include SCWA's aqueduct that delivers Russian River water, wells, and a portion of the unused entitlement of the Forestville Water District from the SCWA. The ability of the VOMWD to meet the increased water demand resulting from implementation of the *Draft GP 2020* would be dependent upon completion of the Water Project, the construction of new wells, and either the extension of the agreement with the Forestville Water District or an increased entitlement from the SCWA.

Policies contained in Section 3.2 of the *Draft GP 2020* (Policies **WR-2a** through **WR-2o**) include provisions for assessing current groundwater conditions, the development of sustainable yield information and basin-wide monitoring programs, revisions to the well permitting process for improved data collection and monitoring, and provisions to protect important groundwater recharge areas. Implementation of the policies contained in Section 3.2 would be integral to the success of County strategies discussed below that pertain to managing water supplies to meet future water demands.

Due to the fact that water supply sources are not always contained within jurisdictional boundaries, cooperation and coordination between all relevant regulatory agencies, municipalities, public and private water suppliers, and other stakeholders is critical. For example, high capacity wells constructed within City boundaries can create problems for private or public water supply wells located in adjacent unincorporated areas, particularly if they both draw groundwater from a common aquifer. Wells drilled in incorporated areas, whether they are private or municipal wells, do not always require County approval. Although the County and individual property owners can comment on projects in incorporated areas that involve discretionary permits during the CEQA review process, there currently is a lack of consistent coordination between municipalities, water departments, and water companies. Policy **WR-3q** would support inter-regional planning efforts between water suppliers, their contractors, and stakeholders to develop the preferred combination of resources to meet demand. Policy **WR-3r** addresses potential controversies between the SCWA and outside water users during efforts to secure alternative supplies. This policy would strive to ensure that the interests of all outside water users and stakeholders associated with potential alternative water sources would be considered and appropriate resolutions developed to prevent impacts to the environment and other water users.

Implementation of the policies contained in the *Draft GP 2020* would foster coordination and cooperation between the County and public water suppliers for the purpose of meeting demand while maintaining sustainable yields and protecting water quality. Under Policy **WR-3a**, the County would work with public water suppliers in assessing the sustainable yield of surface water and groundwater supplies to ensure surface and groundwater supplies do not exceed safe yields. This policy would also explore opportunities for recycled water use, conservation, and potentially feasible alternative water supplies. Implementation of Policy **WR-3c** would gather water resource data from public water suppliers and make it available to other water suppliers and the public.

Policy **WR-3d** focuses on the quality of drinking water obtained from public water suppliers. This policy would require that the County assist public water suppliers in complying with federal and State water quality standards through protection of water supply sources. This policy complements policies associated with urban and agricultural water quality, saltwater intrusion, and failing septic and sewer systems contained in Section 3.1 of the Water Resources Element of the *Draft GP 2020* in that it seeks to protect surface water and groundwater resources from potential contamination. Additionally, Policy

WR-3e would support public water suppliers in developing wellhead protection plans. The plans may include restrictions on land uses and / or practices in areas surrounding wellheads to prevent contamination.

Policies **WR-3j**, **WR-3k**, **WR-3l**, **WR-3p**, and **WR-3s** address the compliance of proposed land uses, water supplies, and transmission facilities with sustainable yields, general plan policies, urban water management plans, water supply agreements, groundwater management plans, Master Facilities Plans, and programs to mitigate identified overdraft conditions, as applicable. Policy **WR-3j** seeks to maintain consistency with such plans through coordination between PRMD and public water suppliers and PRMD review of proposed Master Facilities Plans. Policy **WR-3k** entails County cooperation with public water suppliers in the planning and development of storage and transmission facilities to ensure compliance with all relevant plans and regulations. Under Policy **WR-3l**, public water suppliers would consult with the County prior to acquiring a site or developing facilities for public water supplies in unincorporated areas and request a determination of consistency with the *GP 2020*. Policy **WR-3p** would provide for the involvement of public water suppliers in the development of groundwater management plans to ensure compliance by suppliers with the applicable plans. Policy **WR-3s** would require that the County's land use decisions be consistent with the policies and programs contained in the Water Resources Element of the *Draft GP 2020*.

Ongoing groundwater monitoring is critical for evaluating existing conditions and comparing groundwater extractions against projected sustainable yields. Implementation of **Water Resources Program 7: Groundwater Monitoring and Annual Report** would result in the development of a groundwater database and monitoring program consisting of well permit data and groundwater basin studies. This program and the policies that comprise it would facilitate evaluation of current groundwater conditions. This program also includes the preparation of an annual report to the Board of Supervisors assessing the current status of groundwater conditions in unincorporated areas of the County. Policy **WR-3m** is part of the program and would encourage public water suppliers and other water users of groundwater supplies to monitor and report groundwater levels and yields.

These data would be incorporated into the groundwater database and monitoring program under **Water Resources Program 7**. Such data would serve the County in assisting public water suppliers in evaluating the limits of available water supplies, developing methods to increase efficiency, prioritizing the allocation of existing supplies, and determining acceptable levels of risk of shortages for various users, as required by Policy **WR-3h**. Policy **WR-3i** would require that the County prepare or encourage the preparation of master facilities plans for all public water supply systems. The master facilities plans would be aimed at maintaining sustainable yields and would address estimated future demand, project service and facility needs, estimated costs for any needed improvements, and monitoring and mitigation measures to assure long-term adequacy of resources. In cases where the Master Facilities Plan indicates supplies are inadequate for proposed future land uses and development, a moratorium on development or other restrictive actions may be taken to protect existing services.

Goals and objectives of the *Draft GP 2020* would seek to discourage increased dependency on groundwater supplies. Under Policy **WR-3n**, public water suppliers that utilize SCWA water would be discouraged from utilizing groundwater to supplement supplies. Gray water systems, roof catchment of rainwater, and other methods of reusing water and minimizing the need to use additional groundwater would be encouraged by Policy **WR-4o**.

Significant improvements in water use efficiency, water reuse and reclamation, and water conservation are critical to the long-term viability of the County's water supplies. Several policies and programs contained in the *Draft GP 2020* would encourage an increase in the role of water conservation and the

role of safe, beneficial reuse of secondary- or tertiary-treated wastewater in meeting the water supply needs of both urban and rural users. However, while the policies below would encourage public water suppliers to act in accordance with County desires, they cannot be compelled to do so. As a result, these policies may not be effective in reducing water supply impacts.

Water conservation and education programs with measurable targets for public water suppliers would be supported under Policy **WR-3f**. Policy **WR-4b** would increase efficiency and reduce demand by requiring water conserving design and equipment in new construction, encouraging drought-tolerant landscaping, encouraging retrofitting older buildings and residences with water-conserving devices, designing wastewater systems to minimize inflow and infiltration, and limiting impervious surfaces to minimize runoff and increase groundwater recharge. Policy **WR-4e** would require water-conserving plumbing and water-conserving landscaping in all new development projects. Water-conserving plumbing includes low-flow toilets, faucets, and showerheads. Water-conserving landscaping can involve the use of drought-tolerant native species and drip irrigation systems. Policy **WR-4e** would also include provisions to minimize water loss and waste by County-operated water systems. Policy **WR-4f** would promote education efforts and programs for plumbing retrofits, cost rebates for low-flow fixtures, identification of water leaks, improved landscape irrigation efficiency, and other methods of conservation for water users. Agricultural water conservation is addressed by Policy **WR-4h**. This policy would encourage increased water use efficiency for crop irrigation, frost protection, and livestock.

Assessing current water consumption is an important step towards improving water use efficiency. Policy **WR-4c** would support programs to monitor, establish and publicize per capita or per unit water use in each community and utilize this data in preparing groundwater management plans, Master Facilities Plans, and wastewater treatment plans. This data would also be useful in projecting water demand for new development proposals. Policy **WR-4d** would encourage public water suppliers to use water meters and develop pricing systems based on water use to provide incentives for conservation and reuse programs. Water consumption and conservation opportunities for County buildings and facilities are addressed under Policy **WR-4i**.

Improvements in water treatment technologies over the last two decades have increased the feasibility of water reclamation and reuse to augment water supplies. The *Draft GP 2020* promotes potential opportunities for water reclamation and reuse while protecting the water quality. Policies **WR-4k**, **WR-4l, WR-4n** would encourage the reuse of wastewater for agricultural crops and other types of irrigation and wildlife enhancement projects, as practicable, provided the reclaimed water meets applicable regulatory water quality standards for the intended use and would not compromise the beneficial uses of other water resources. Policy **WR-4j** would ensure that wastewater disposal systems are designed to reclaim and reuse treated water to the extent practicable. Policy **WR-4m** would have the County coordinate with the cities and other wastewater treatment entities in minimizing the impacts of reusing treated water on agricultural activities, geothermal activities, and other appropriate uses in incorporated and unincorporated areas.

In conclusion, current procedures and policies and programs contained in the *Draft GP 2020* would strive to secure adequate water supplies for unincorporated USAs through water use assessments and monitoring, determination of safe water yields, conservation, and reclamation and reuse. These policies and programs as well as mitigation measures contained in ***Section 4.5 Hydrology and Water Resources*** would reduce the onset and severity of water supply deficiencies which are presently not quantifiable. However, sufficient water supplies may not be available at this time to serve all future land uses and development consistent with the *Draft GP 2020* within some of the unincorporated USAs. New or expanded entitlements or facilities as previously described may be required.

As development proceeds over time, public water suppliers are afforded the opportunity to review projects in the urban areas and to determine whether or not water supplies are available. At any time that sufficient water is not available, the supplier can notify the County of that fact and provide the basis for County denial of a project or projects until additional water supplies are available.

Nonetheless, the uncertainty over long-term availability of water supplies and facilities and the lack of direct County jurisdiction over public water suppliers results in a level of uncertainty about the adequacy of future supplies in some urban areas. Therefore, this would be a significant impact.

Mitigation Measure 4.9-1 No mitigation available beyond the *Draft GP 2020* policies discussed in the impact analysis above.

Significance After Mitigation This would be a significant unavoidable impact. (**SU**)

Impact 4.9-2 Insufficient Water Supplies to Meet the Future Water Demand of Rural Private Domestic, Small Municipal, and Agricultural Wells

*Land uses and development consistent with the Draft GP 2020 would result in an increased demand on groundwater supplies for rural uses. Due to the lack of comprehensive information regarding the county's groundwater resources, it is uncertain if groundwater supplies would be sufficient to meet the future demand of rural private domestic, small municipal, and agricultural wells. This uncertainty combined with the current regulatory approach could result in insufficient groundwater supplies in rural areas of the county. This would be a significant impact. **(S)***

The majority of water users in rural unincorporated areas would continue to be dependent upon groundwater to meet their water needs. As discussed under *Impact 4.5-5 Groundwater Level Decline*, the uncertainty of the county's groundwater supplies to sustainably meet the future increased water demand stems from the fact that the current state of groundwater resources in the county is largely unknown. Until comprehensive assessments have been conducted, it is not possible to conclude that the county's groundwater resources would be capable of meeting future water demands resulting from implementation of the *Draft GP 2020*.

It is expected that the population of Sonoma County would increase by about 87,450 by 2020. Of this, approximately 19,100 persons, or 28 percent of the population increase, would be expected to populate unincorporated areas. [16] At an estimated annual water use of 0.17 acre-feet per person, the projected unincorporated future residential water demand in rural areas would increase by approximately 3,210 acre-feet per year. [17]

The great majority of future agricultural growth is expected to occur in unincorporated areas of the county. According to **Exhibit 4.5-7**, vineyard acreages are projected to increase by approximately 15,900 acres between 2002 and 2020. Given that the current annual grape irrigation is approximately 1.0 acre-foot of water per acre, this represents roughly 15,900 acre-feet of increased water demand for grape irrigation alone. [18] Although future acreages for other crop types have not been estimated,

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16 *Sonoma County General Plan 2020 Public Hearing Draft,* Sonoma County PRMD, October 2004.

17 Based on a rural residential water use estimate of 150 gallons/person/day.

18 Based on average annual acreages vs. applied water in **Exhibit 4.9-3**.

historically, other agricultural crops have represented approximately 25 percent of the total agricultural acreage and 45 percent of the total agricultural water use. [19]

The sum of the projected rural residential water demand and projected agricultural water use for vineyards and other crop types represents a conservative estimate of the projected increase in water demand in unincorporated areas of the county. According to these numbers, land uses and development consistent with the *Draft GP 2020* in the rural unincorporated area would result in an increase of approximately 32,000 acre-feet in water demand per year. [20] Although the current groundwater usage in the county is not known, water usage in 2001 was roughly estimated to be on the order of 199,900 acre-feet. [21] Thus, the 32,000 acre-feet represents about a 16 percent increase in estimated water usage from 2001.

As discussed under *Impact 4.5-5 Groundwater Level Decline,* several policies and programs contained in Section 3.2 of the *Draft GP 2020* would improve groundwater management practices through groundwater monitoring and research as well as protecting groundwater resources through revisions to current regulations regarding well permits and procedures. The *Draft GP 2020* also contains provisions to protect groundwater recharge areas and increase groundwater infiltration. The establishment of an ongoing groundwater monitoring program throughout the county would facilitate the evaluation of groundwater levels, storage, and recharge. This information would be compiled with groundwater data from public and private water suppliers, well permit data, and other applicable sources.

The *Draft GP 2020* would call for the completion of comprehensive groundwater assessments for each major groundwater basin in the county as well as other isolated groundwater problem areas that are identified by the County in the future. Revisions to the current well permitting process would impose more stringent requirements for proof of water quantity and quality. Revisions to the well permitting ordinance would include metering to monitor usage and setbacks from property lines and existing wells to prevent impacts to surrounding wells. The *Draft GP 2020* would also seek to maintain and enhance groundwater recharge by encouraging implementation of standards to regulate impervious surfaces and provide for water impoundments to increase retention and recharge. Proposed Mitigation Measure 4.5-5 would further assist in this effort.

Increased water savings gained from conservation and re-use programs could provide the County with ability to reduce the projected increases in groundwater demand. The degree to which conservation and re-use programs would result in increased water savings would depend on the extent to which the County and water suppliers can effectively implement educational outreach programs (e.g., those described in policies **WR-2b** and **WR-3h**). Educational programs related to water conservation and re-use, including landscape irrigation and retrofit programs, would assist in balancing the projected water demand with a sustainable water supply.

Implementation of the policies and programs contained in the *Draft GP 2020* and Mitigation Measure 4.5-5 would partially reduce the impact to water resources associated with uncertain future groundwater availability. Yet, even with the adoption and implementation of the proposed policies

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19 See **Exhibit 4.9-3**.

20 3,210 ac-ft/yr (residential) + 15,900 ac-ft/yr (vineyards) + 13,000 ac-ft/yr (other crops) = ~32,110 ac-ft/yr

21 See **Exhibit 4.9-4**.

and programs, the ability of groundwater resources to meet the increased water demand resulting from the implementation of the *Draft GP 2020* would remain uncertain. As the analysis of potential impacts without completion of recommended groundwater assessments would be speculative, it must be concluded that there would be a significant impact to groundwater resources resulting from implementation of the *Draft GP 2020*.

Mitigation Measure 4.9-2 Same as Mitigation Measure 4.5-5.

Significance After Mitigation The recommended mitigation measure may help reduce the impact to water resources associated with uncertainties in water supply and groundwater sustainability for many unincorporated areas that rely on groundwater resources to a less-than-significant level. However, the impact to areas with known, suspected, or evolving groundwater management problems (especially in those areas identified in the setting section) would remain significant. Therefore, this would be a significant unavoidable impact. **(SU)**

Responsibility and Monitoring The Board of Supervisors would be responsible for adopting the revised policy **WR-2f** as proposed in Mitigation Measure 4.5-5 as part of the *GP 2020*. The PRMD would be responsible for adopting and implementing revisions to Policy **WR-2f** as outlined in Mitigation Measure 4.5-5.

Impact 4.9-3 New or Expanded Water Supply Facilities

Land uses and development consistent with the Draft GP 2020 could result in the need for increased water supply facilities, either through the construction of new facilities or through the expansion or retrofitting of existing facilities. Construction of new or expanded water supply facilities could result in site-specific impacts, especially on aquatic organisms and fisheries. This would be a significant impact. ***(S)***

As the demand for water increases with population and job growth, the need for additional water supply facilities will also increase. These facilities could include water treatment facilities, pipelines, pumphouses, wells, etc. As water reuse increases, facilities that recycle used water may also be needed depending upon the needs of each public water supplier. The site-specific impacts of these facilities cannot be determined until such time that the facilities are proposed and subjected to environmental review. Typical impacts would likely be construction related noise, dust, and grading. The fact that water facilities may be located near streams or water bodies would mean that impacts to fish and wildlife, erosion, and stream flow may also occur.

The *Draft GP 2020* contains several policies that would reduce some of the environmental impacts related to the demand for new or expanded water supply facilities. Policy **WR-3b** would require that the County support to the extent feasible the actions of public water suppliers to meet future demands in a manner protective of the natural environment. Policy **WR-3o** would encourage public water suppliers to avoid or minimize significant environmental impacts resulting from the enhancement of water supplies and construction of new storage and transmission facilities. Potential environmental impacts associated with the export and import of water supplies are addressed by Policies **WR-5a** and **WR-5b**. These policies require that a full assessment of environmental impacts associated with the export and import of water supplies by conducted as part of the proposal process.

In addition, the **Residential Use**, **Commercial Use**, and **Industrial Use** policies (sections 2.2 through 2.4 of the Land Use Element), policies **LU-2a**, **LU-3c**, **LU-3d**, **LU-5b**, **LU-5d**, **LU-6a**, as well as policies that pertain to specific Planning Areas, would reduce the need for additional water supply facilities by maintaining low densities and limited commercial and industrial development outside of the USAs.

The *Draft GP 2020* also includes a number of policies and programs that would help limit potential impacts related to the construction of needed water supply facilities. For example, Policy **OSRC-8c**, would reduce potential impacts to riparian corridors by requiring future development be sited a minimum of 50 feet (or up to 200 feet in certain circumstances) from the top of banks of streams. Policies **OSRC-11b** and **WR-1h** would reduce potential water quality impacts due to erosion at construction sites. The policies require including control measures for projects involving construction or grading near waterways or on steep slopes and that grading plans include measures to avoid soil erosion and sedimentation in storm water to the maximum extent practical. Policy **OSRC-16c** would, through project review by the local air quality district, help minimize air pollution.

Although these policies and programs may reduce some of the adverse environmental impacts associated with the construction and operation of new or expanded water supply facilities, analysis of site-specific impacts is beyond the scope of this EIR and would be evaluated as part of a separate environmental review for the individual project. In addition, impacts resulting from the construction of these facilities are evaluated at a program level throughout this EIR, since these facilities are considered to be part of the *Draft GP 2020*. This would be a significant impact

Mitigation Measure 4.9-3 No mitigation available beyond the *Draft GP 2020* policies discussed in the impact analysis above.

Significance After Mitigation This would be a significant unavoidable impact. (**SU**)

Wastewater Management Services – Environmental Setting

Incorporated cities and special districts own and operate numerous centralized wastewater collection and treatment systems throughout the county. The discharge of treated effluent and disposal of biosolids is permitted by the corresponding RWQCB (either the North Coast or the San Francisco Bay). Rural areas not served by centralized systems use on-site septic systems subject to regulation by the Sonoma County PRMD, with larger systems subject to the approval of the RWQCBs.

CONVENTIONAL WASTEWATER TREATMENT PLANTS

Conventional wastewater treatment plants typically receive and treat wastewater either from multiple parcels and land uses or agricultural processing facilities on a single parcel and produce secondary or tertiary-treated effluent. In the first case, the facility is typically owned and operated by a public agency, usually a sanitation district, and is built to service large to very large wastewater flows. [22]

There are eleven wastewater treatment plants in unincorporated Sonoma County as listed in **Exhibit 4.9-9**. The North Coast RWQCB or the San Francisco Bay RWQCB, depending on the location of the plant, regulates discharge from each treatment plant. Inadequate treatment capacity, aging and / or malfunctioning facilities, and / or the implementation of stricter treatment or discharge standards by the RWQCB are factors that often lead to necessary plant improvements.

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22 *Package Treatment Plants,* CAC memo, Richard C. Rogers, Sonoma County PRMD, October 17, 2002.

With the exception of South Santa Rosa and Penngrove, all districts serving Urban Service Areas (USAs) in unincorporated Sonoma County maintain independent facilities to collect, treat, and / or dispose of wastewater. South Santa Rosa receives sewer service from the South Park County Sanitation District, which contracts with the City of Santa Rosa for wastewater treatment and disposal. The Penngrove Sanitation Zone contracts with the City of Petaluma for sewer service. [23] **Exhibit 4.9-9** presents basic information about the 11 existing sanitation zones and wastewater service providers in the county, all of which are managed by SCWA, with the exception of the Bodega Bay Public Utility District and Forestville. [24] The Sonoma Valley County Sanitation District (CSD) treatment facility is located within the jurisdiction of the San Francisco Bay RWQCB. The remaining facilities are under the jurisdiction of the North Coast RWQCB. [25]

PACKAGE WASTEWATER TREATMENT PLANTS

Package wastewater treatment plants are treatment facilities manufactured off-site in a modular fashion and delivered in "packages" (truckloads) to be installed at a particular location. They may be ordered in different sizes and may be connected together to achieve treatment of fairly large wastewater flows. [26] Package wastewater treatment plants are smaller than municipal wastewater treatment plants and are generally located in unincorporated areas of the county. They are privately owned and maintained, typically serving specific developments (e.g., planned communities) or specific uses (e.g., wineries or industry). Like the larger conventional wastewater treatment plants, package plants are regulated by the San Francisco Bay or North Coast RWQCBs. While these plants may offer better treatment of wastewater, their use can be challenging in that the financial responsibility for plant operation, maintenance, and potential RWQCB penalties may be in the hands of one or more private property owners who may not have adequate financial resources to deal with problems when they arise.

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23 *Water and Sewer Capacities: Preliminary Report,* CAC memo, Richard C. Rogers, Sonoma County, August 15, 2002.

24 Sewer service for the Monte Rio USA has been approved but not constructed.

25 *Wastewater Treatment,* Sonoma County Water Agency, accessed online at http://www.scwa.ca.gov/svtp.html , December 2002.

26 *Package Treatment Plants,* CAC memo, Richard C. Rogers, Sonoma County PRMD, October 17, 2002.

Exhibit 4.9-9
Wastewater Treatment and Disposal Methods

Sanitation Districts or Zones	Service Area (Acres)	Current Permitted Capacity (MGD) [a]	Average Dry Weather Flow, 1998-2002 (MGD) [b]	Percent of Current Capacity in Use	Level of Treatment	Effluent Disposal	
						Summer	Winter
Sea Ranch, Central	27	0.027	0.004	15	Secondary	Irrigation and Percolation	
Sea Ranch, North	305	0.130	0.019	15	Secondary	Irrigation	
Bodega Bay		0.430	0.240	56	Tertiary	Irrigation	
Occidental	55	0.050	0.017	35	Secondary	Irrigation	Dutch Bill Creek
Geyserville	177	0.092	0.054	59	Secondary	Percolation and Evaporation	
Forestville	70	0.100	0.064	64	Tertiary	Irrigation	Jones Creek
Russian River	2,700	0.710	0.295	41	Tertiary	Irrigation	Russian River
Airport-Larkfield-Wikiup	2,100	0.900	0.672	75	Tertiary	Irrigation	Stored for Irrigation
Graton	260	0.140	0.099	71	Secondary	Irrigation	Atascadero Creek
Sonoma Valley	4,500	3.000	2.525	84	Secondary	Irrigation	Schell Slough
Sanitation District or Zone	**Service Area (Acres)**	**Current Contracted Capacity (MGD)**	**Current Flows (MGD)**	**Percent of Current Capacity in Use**	**Level of Treatment**	**Effluent Disposal**	
						Summer	**Winter**
South Park	NA	0.700	0.705	101	Tertiary	Irrigation and Geysers	Laguna and Geysers
		Current Contracted Capacity (ESDs) [c]	**Current Flows (ESDs) [d]**				
Penngrove	475	1,090.91	484	44	Secondary	Irrigation and Evaporation	Evaporation and Petaluma River

a MGD = Million Gallons per Day
b Average dry weather flow is the lowest average total flow over a period of 30 consecutive days.
c Equivalent Single Family Dwelling (service recipients) – one ESD is the expected wastewater generation from a typical single family dwelling.
d NA = Not Available due to rate of annexation by City of Santa Rosa.

Sources: Sonoma County Water Agency, Bodega Bay Public Utilities District, Cities of Santa Rosa and Petaluma

SEPTIC SYSTEMS

Most residences and some small educational, public, commercial, and industrial facilities in unincorporated areas of the county rely upon individual septic systems to treat and dispose of wastewater. Although the total number of septic systems in use in Sonoma County is not known, it is estimated by PRMD to be about 35,000. Assuming that each of the estimated 35,000 residential septic systems serves a household averaging 2.8 people, some 95,000 residents of Sonoma County utilize on-site systems for wastewater disposal. This represents approximately 75 percent of the unincorporated county residents and about 20 percent of the total county population.

PRMD is responsible for evaluating proposed septic system design plans and issuing septic system permits in the county. There are two primary types of septic systems: standard septic systems and alternative septic systems. A *standard septic system* consists of an appropriately sized septic tank and leachfield. Standard septic systems are ministerial permits, provided all necessary site conditions and design and construction requirements are met. Such systems must be serviced (pumped) every two to three years. *Alternative septic systems* are necessary when site conditions do not meet the standard septic system requirements (e.g., low soil percolation rates, inappropriate distance to groundwater, shallow soils, steep slopes, etc.). Alternative septic systems include *filled land*, *shallow sloping*, *mound*, and *pressure distribution* systems. The maintenance of alternative systems depends on the type of system. Systems such as Mound and Pressure Distribution require quarterly monitoring.

Wastewater Management Services – Regulatory Setting

COUNTY REGULATIONS

Acquisition of land for and construction of wastewater treatment facilities in the unincorporated area is subject to County review for consistency with the Sonoma County General Plan under Section 65402 of the Government Code. While many public agency sponsors will strive to develop facilities that are consistent with the General Plan, they have the authority to override the County's determination and proceed with acquisition and construction.

The Sonoma County PRMD is responsible for the review and permitting of individual on-site septic systems, and some community systems that involve the use of on-site septic tanks, with the collection and disposal of effluent from several systems. Individual septic systems are granted permits provided that all relevant conditions and / or regulations are met. Larger systems, including some commercial and industrial systems, are also subject to the review and approval of the Regional Boards. Some of the rules and regulations pertaining to the design and construction of on-site wastewater systems are detailed in the County Code. Others are contained in internal guidance documents and memoranda available from PRMD staff.

Several areas in unincorporated Sonoma County are under restrictions which limit the expansion or remodeling of residences or businesses due to a preponderance of older and inadequate septic systems. Camp Meeker, Monte Rio, Sereno Del Mar, Jenner, South Wright Road, Carmet, and Salmon Creek are small communities that are designated *Waiver Prohibition Areas*. In these areas, water quality problems resulting from older septic systems are severe and the soil conditions will not support septic system upgrades under current environmental health standards.

STATE AND REGIONAL REGULATIONS

The State Water Resources Control Board (SWRCB), in coordination with two of the nine Regional Water Quality Control Boards (RWQCBs), regulates water quality, including issuance of discharge permits in Sonoma County. [27] As mentioned in the ***Water Supply Services*** subsection and in ***Section 4.5 Hydrology and Water Resources***, the federal NPDES program regulates point source discharges from wastewater treatment plants that discharge directly to surface waters. Each NPDES permit contains limits on allowable concentrations contained in the discharge, and typically a self-monitoring and surveillance program. The NPDES program is administered by the SWRCB and the RWQCBs under procedures outlined in the State Water Code.

Water Quality Control Plans, also referred to as Basin Plans, are prepared by each RWQCB for its respective region. The plans designate beneficial uses for specific surface and groundwater resources and establish water quality objectives and implementation programs. The Regional Boards issue Waste Discharge Requirements (WDRs) permits in compliance with the applicable plans for major point-source discharges, such as municipal wastewater treatment plants and industrial facilities.

Wastewater Management Services – Significance Criteria

According to the *State CEQA Guidelines*, the project would have a significant wastewater management services impact if it would:

- Not meet wastewater treatment requirements of the applicable RWQCB;
- Violate any water quality standards or waste discharge requirements;
- Result in the determination by the wastewater treatment provider that serves or may serve the project that it has inadequate capacity to serve the project's projected demand in addition to the provider's existing commitments;
- 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; or
- Otherwise substantially degrade water quality.

Analysis of water quality impacts related to the discharge of wastewater are discussed in *Impact 4.5-4 Water Quality – Wastewater Disposal* contained in ***Section 4.5 Hydrology and Water Resources***. Analysis of capacity impacts related to wastewater treatment services resulting from implementation of the *Draft GP 2020* are discussed below.

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27 *California Environmental Protection Agency,* California Environmental Protection Agency, accessed online at http://www.calepa.ca.gov/ , December 2002.

Wastewater Management Services – Impacts and Mitigation Measures

Impact 4.9-4 Increased Wastewater Treatment Demand

Land uses and development consistent with the Draft GP 2020 would generate wastewater flows that exceed treatment capacity of wastewater treatment services and would require both construction of new facilities and improvements to existing facilities. This would be a significant impact. ***(S)***

Provision of adequate wastewater system capacity in urban areas of Sonoma County is largely the responsibility of public agencies that are not under the jurisdiction of the County. These agencies must not only maintain their systems and facilities to serve existing users, but also must expand as needed to accommodate projected growth within each service area. It is not always possible to assure adequate capacity and facilities fifteen or twenty years in advance of growth due to funding limitations and permitting and environmental entitlements. As a result, this analysis of the adequacy of future wastewater capacity is based upon whether or not there is a reasonable likelihood that the public wastewater systems will be able to successfully bring future capacity on line in order to serve their respective districts. The following analysis relies upon PRMD staff studies conducted in coordination with the applicable wastewater system providers. [28]

According to PRMD staff analysis, as described in **Exhibit 4.9-8**, four of the 11 unincorporated USAs are deemed to have significant concerns with regards to the ability of wastewater treatment providers to treat future wastewater flows. Significant concerns means that the wastewater treatment provider lacks the current capacity to serve projected growth and buildout estimates and would likely experience significant difficulties expanding the system to meet projected demand. Four facilities are considered as clearly having the capacity to meet projected growth while the remaining three facilities are considered to have capacity to serve projected growth or are likely to solve capacity issues within the time horizon of *GP 2020*. Wastewater capacity analysis by urban service area (USA) is summarized in **Exhibit 4.9-10**. [29]

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[28] For a more thorough discussion of this issue see *Water and Sewer Capacities Final Report*, Richard Rogers, Sonoma County PRMD, October 16, 2003.

[29] *Water and Sewer Capacities: Final Report*, CAC Memo, Richard Rogers, Sonoma County PRMD, October 16, 2003.

Exhibit 4.9-10
2020 Wastewater Treatment Capacity, Surplus, and Deficits

Sanitation District	Current Permitted Capacity (MGD) [a]	Average Dry Weather Flow, 1998-2002 (MGD) [b]	Remaining Capacity in 2003 (MGD)	Planned Capacity by 2020 (MGD) [c]	Gallons per ESD per Day [d]	Available Capacity in 2020 (ESDs)	Total Projected Increase in ESDs by 2020	ESD Surplus or Deficit Based on 2020 Projection
Sea Ranch Central	0.027	0.004	0.023	0.027	200	115	13	102
Sea Ranch North	0.130	0.019	0.111	0.130	200	554	140	414
Bodega Bay	0.355	0.240	0.115	0.430	200	1,136	440	696
Occidental	0.050	0.017	0.033	0.050	66	495	57	438
Geyserville	0.092	0.054	0.038	0.092	200	188	261	-73
Forestville	0.100	0.064	0.036	0.130	140	473	326	147
Russian River	0.710	0.295	0.415	0.710	120	3,462	1,077	2,384
Airport-Larkfield-Wikiup	0.900	0.672	0.228	1.200	280	1,884	4,866	-2,982
Graton	0.140	0.099	0.041	0.140	150	270	361	-90
Sonoma Valley	3.000	2.525	0.475	3.000	200	2,377	3,514	-1,137

Sanitation District	Current Contracted Capacity (MGD)	Current Flows (MGD)	Remaining Capacity in 2003 (MGD)	Planned Capacity in 2020 (MGD)	Gallons per ESD per Day	Total Projected Increase in ESDs by 2020	ESD Surplus or Deficit Based on 2020 Projection
South Park	0.700	NA [e]	NA	0.700	233	3,334	NA

Sanitation Zone	Current Contracted Capacity (Persons)	Current Flows (MGD)	Gallons per ESD per Day	Current Flow (ESDS)	Current Contracted Capacity (ESDs)	Remaining Capacity in 2003 (ESDs)	Total Projected Increase in ESDs by 2020	ESD Surplus or Deficit Based on 2020 Projection
Penngrove	3,000	0.087	180	484	1,091	607	357	250

a MGD = Million Gallons per Day
b Average dry weather flow is the lowest average total flow over a period of 30 consecutive days.
c Planned Capacity by 2020 reflects projects underway in 2003.
d Equivalent Single Family Dwelling. One ESD is the expected wastewater generation from a typical single family dwelling. In this table, ESD data includes waste water from commercial, industrial, and other users, expressed as ESDs.
e NA = Not Available.

Source: Sonoma County PRMD, Sonoma County Water Agency, and Bodega Bay Public Utilities District

The Airport-Larkfield-Wikiup Sanitation Zone (ALWSZ) currently operates at a permitted capacity of 0.9 MGD. [30] Planned improvements (i.e., a new aeration lagoon) would allow a dry weather capacity of 1.2 MGD and result in excess capacity capable of serving an additional 1,884 ESDs, for a total of 5,246 ESDs. [31] Projected growth would require capacity to serve 8,228 ESDs and therefore result in a deficit of 2,982 ESDs. The actual amount of development that would occur however, would be constrained by the California American Water Company's ability to acquire significant new water sources in order to accommodate either projected growth or buildout of the land use map. [32]

The Geyserville Sanitation Zone (GSZ) currently serves 272 ESDs with excess capacity to serve an additional 187 ESDs, for a total of 459 ESDs. The GSZ treatment facility does not have a master facility plan or plans for capacity expansion beyond this level. Projected growth would require capacity to serve 533 ESDs, representing a deficit of 73 ESDs.

The Occidental USA is served by the Occidental County Sanitation District (OCSD). Potential demand from new commercial and residential development would be low as most commercial lots are developed. The existing treatment facility requires significant upgrades in order to meet both existing and planned flows. [33] The OCSD is currently under a Cease and Desist and Time Schedule Order from the RWQCB which requires the design and construction of a new wastewater treatment facility that would serve both Occidental and Camp Meeker.

The Sonoma Valley County Sanitation District (SVCSD) serves a combination of city and county areas including the City of Sonoma, Glen Ellen, Eldridge, Fetters Hot Springs, Agua Caliente, Boyes Hot Springs, El Verano, and the Temelec areas. SVCSD staff has indicated that existing treatment and disposal facilities have capacity to serve an additional 2,377 ESDs. However, SVCSD also serves the City of Sonoma, which develops approximately 100 ESDs per year under its growth management plan and projects an additional 150 ESDs through commercial buildout. This would result in 1,850 new ESDs by 2020. Implementation of the *Draft GP 2020* would therefore result in a deficit of 1,137 ESDs due to projected growth by the SVCSD for the entire service area. Improvements to disposal capacity would be required to accommodate projected development and a restriction on annexation of new lands into the SVCSD is currently in effect.

The Monte Rio Wastewater Pollution Control project was initiated in 1997 to improve public health hazards related to malfunctioning septic systems. The project proposes the construction of a new wastewater treatment facility that would serve 455 existing residences and allow development of 131 existing vacant residential parcels at a projected rate of ten per year. The facility would also serve existing commercial development and allow new development on ten vacant commercial properties.

Three facilities identified in **Exhibit 4.9-8** as adequate with concerns either have the capacity to serve projected growth (but not buildout) under the *Draft GP 2020* or would likely resolve capacity issues

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30 MGD - Million Gallons per Day

31 ESD - Equivalent Single Family Dwelling (service recipients) – one ESD is the expected wastewater generation from a typical single family dwelling.

32 *Water and Sewer Capacities: Final Report*, CAC Memo, Richard Rogers, Sonoma County PRMD, October 16, 2003

33 *Water and Sewer Capacities: Final Report*, CAC Memo, Richard Rogers, Sonoma County PRMD, October 16, 2003

within the time horizon of *GP 2020*. [34] The Russian River USA, served by the Russian River County Sanitation District (RRCSD) faces limitations in disposal capacity and would require the construction of improvements to accommodate projected development. The Graton Community Services District (GCSD) would need to develop additional storage and capacity needs or increase transfer of secondary effluent to the Forestville wastewater treatment facility. [35] South Park County Sanitation District's (SPCSD) ability to adequately meet increased capacity demands resulting from implementation of both the *Draft GP 2020* and the City of Santa Rosa General Plan would also be of concern. Quantifying capacity impacts to this area; however, would be speculative as the proportion of projected growth or buildout that would occur prior to annexation by the City of Santa Rosa is unknown.

Several policies of the *Draft GP 2020* would reduce wastewater impacts by addressing the service provider's ability to meet increased capacity requirements resulting from projected growth during the planning process. Policy **PF-1a** would require planning, designing and construction of new sewer services to correlate with projected growth consistent with the *Draft GP 2020*. Policy **PF-1c** would require discretionary project applications to obtain written certification that existing wastewater services would be available prior to project approval.

Policy **PF-1b** would encourage the preparation of master facility plans (MFPs) for wastewater management systems. MFPs are long range planning documents specific to the wastewater treatment provider's unique parameters in terms of size, geography, topography, age of equipment, rate structure, and development potential within the service area. This policy would specify a minimum of five areas the MFP must address. Treatment providers would be requested to establish and delineate service area boundaries, to project future growth within the service area, and identify needed improvements and associated costs, system design parameters and assumptions, and monitoring and mitigation measures.

Preparation of MFPs would help reduce wastewater impacts by examining potential solutions to existing and projected facility needs. Long range planning in these five areas would help Sonoma County avoid approving zoning changes, land use amendments and new development for which service is either not available (i.e., outside of the service area boundary) or planned for within the MFP. Implementation of this policy would therefore protect services to existing residents and ensure each provider is capable of meeting RWQCB treatment requirements at capacities not exceeding facility limits. In practice however, not all facilities currently have MFPs and the County does not typically have the authority to require them. Instead, long range planning often occurs in environmental documents for major facility improvements. Treatment providers find this approach more cost-effective as opposed to preparing an additional EIR during the MFP process. Of the 12 wastewater treatment providers in unincorporated Sonoma County only the Bodega Bay Public Utilities District (BBPUD) has an MFP. Occidental CSD, Forestville SSZ, Russian River CSD, Monte Rio, Airport-Larkfield-Wikiup SZ, Graton CSD, and Sonoma Valley CSD have some level of facilities planning contained in various facility-related EIRs. South Park CSD, Penngrove SZ, and Geyserville CSZ have no known planning documents. [36]

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[34] *Water and Sewer Capacities: Final Report*, CAC Memo, Richard Rogers, Sonoma County PRMD, October 16, 2003.

[35] *Water and Sewer Capacities: Final Report*, CAC Memo, Richard Rogers, Sonoma County PRMD, October 16, 2003.

[36] *Water and Sewer Capacities: Final Report*, CAC Memo, Richard Rogers, Sonoma County PRMD, October 16, 2003.

Additionally, as some providers rely on various treatment agreements between providers to meet discharge standards, coordination of MFPs is essential to long-term wastewater impact reduction. For example, the Graton CSD is able to comply with Basin Plan requirements for discharge to Russian River tributaries through a transfer agreement with Forestville WD. The Forestville facility, with current excess capacity, is able to treat the secondary effluent from the Graton facility to tertiary standards before discharge into Atascadero Creek.

Implementation of policy **PF-1f** would avoid wastewater extension of public sewer services outside of either a LAFCO adopted sphere of influence (SOI) or an urban service area (USA). USAs and LAFCO mandated SOIs establish and maintain a boundary beyond which only uses compatible with preserving agriculture and open space resources are allowed. This policy would continue to be a useful tool, especially when accompanied by definitive urban growth boundaries (UGBs), to ensure that premature urbanization and other development does not occur in open space and agricultural areas. By directing growth to urban areas, Sonoma County would save on infrastructure related costs, maintain levels of wastewater treatment service to existing residents, and avoid future wastewater capacity impacts. Exceptions to this policy include: when necessary to resolve a public health hazard (e.g., malfunctioning septic systems), to serve development permitted under Policy **OSRC-1c**, or when necessary to serve new moderate to low income housing development.

Policy **PF-1g** would place additional guidelines upon exceptions allowed by Policy **PF-1h** including requiring a property to be adjacent to the urban service boundary, design of sewage facilities at a scale to serve land uses and development consistent with the *GP 2020*, and that written certification of adequate service capacity is available. This policy would appropriately scale as well as limit approval of new development that could generate wastewater flows exceeding treatment capacity.

Policy **PF-1k** would limit the consideration of new conventional and package wastewater treatment facilities to serving agricultural support facilities consistent with the Agricultural Element, or to resolve existing public health hazards provided that availability would not result in land uses and development inconsistent with the *Draft GP 2020*,or the plant is owned and operated by a public agency. Package wastewater treatment plants are a technology that can reduce water quality problems from development as well as provide service to address public need. Growth inducing impacts that might result from use of these plants are addressed in ***Section 6.1 Growth Inducing Impacts***.

In conclusion, current project review procedures and policies and programs of the *Draft GP 2020* would strive to secure adequate wastewater services for unincorporated USAs through expansion and / or improvement of collection, treatment, and disposal systems as necessary to accommodate planned growth. These policies and programs would improve the likelihood that the increased demand for these services would be met, but their success depends upon the decisions of service providers who are not under jurisdiction of the County.

As development proceeds over time, public wastewater system providers are afforded the opportunity to review projects within their district boundaries and to determine whether or not the capacity to serve is available. At any time that sufficient capacity is not available, the supplier can notify the County of that fact and provide the basis for County denial of a project or projects until service capacity is available.

Nonetheless, the uncertainty over long-term capacity of some districts as noted above combined with the lack of direct County jurisdiction over wastewater service providers would result in a level of uncertainty about the adequacy of capacity in some districts. Therefore, this would be a significant impact.

Mitigation Measure 4.9-4 No mitigation available beyond the *Draft GP 2020* policies discussed in the impact analysis above.

Significance After Mitigation This would be a significant unavoidable impact. (**SU**)

Impact 4.9-5 New or Expanded Wastewater Facilities

Land uses and development consistent with the Draft GP 2020 could result in the need for increased wastewater facilities, either through the construction of new facilities or through the expansion or retrofitting of existing facilities. Construction of these facilities could result in site-specific impacts. This would be a significant impact. ***(S)***

As the demand for wastewater treatment increases with population and job growth, the need for additional facilities will also increase. These facilities could include wastewater collection, treatment, and disposal facilities, pipelines, pumphouses, etc.

The site specific impacts of these facilities cannot be determined until such time that that the facilities are proposed and subjected to environmental review. Typical impacts would likely be construction related noise, dust, grading and water pollution. The fact that wastewater facilities may be located near streams or water bodies would mean that impacts to fish and wildlife, erosion, and stream flow may also occur.

The *Draft GP 2020* includes a number of policies and programs that would help limit potential impacts related to the construction of needed wastewater facilities. For example Policy **OSRC-8c**, would reduce potential impacts to riparian corridors by requiring future development be sited a minimum of 50 feet (or up to 200 feet in certain circumstances) from the top of banks of streams. Policies **OSRC-11b** and **WR-1h** would reduce potential water quality impacts due to erosion at construction sites. The policies require including control measures for projects involving construction or grading near waterways or on steep slopes and that grading plans include measures to avoid soil erosion and sedimentation in storm water to the maximum extent practical. Policy **OSRC-16c** would, through project review by the local air quality district, help minimize air pollution.

While these and other policies and programs of the *Draft GP 2020* would likely reduce many of the environmental impacts related to the construction and expansion of wastewater treatment facilities to a less-than-significant level, analysis of potential impacts without identified sites and complete designs would be speculative and would be addressed at the time that the facilities are proposed. Additionally the completion of master facilities plans, improvements to existing facilities, and the construction of new wastewater treatment plants would be beyond the control of Sonoma County and would be the responsibility of the wastewater treatment provider. Sonoma County cannot be certain that the master facilities plans would be developed, additional facilities would be constructed, or that construction related mitigation would be completed. It should be noted however, that the impacts of facility construction are evaluated at the program level throughout this EIR since these facilities are considered to be part of the *Draft GP 2020*. As a result, this would be a significant impact.

Mitigation Measure 4.9-5 No mitigation available beyond the *Draft GP 2020* policies discussed in the impact analysis above.

Significance After Mitigation This would be a significant unavoidable impact. (**SU**)

Solid Waste Management Services – Environmental Setting

Solid waste is generated from a mix of residential, commercial, and industrial sources in the county. In 2003, a solid waste characterization study showed that 55 percent of the 1,165,936 tons of solid waste generated in the county was diverted from landfills through recycling, composting, and other waste diversion methods. [37]

There are both public and private sector recycling programs. In the private sector, recyclables are collected by local haulers, drop-off and buy-back operations, and material reuse and recovery programs. A few companies conduct other commercial recycling. Recyclables collected in the county are transported to larger facilities outside the county and are sold to both domestic and overseas end-use markets.

The remainder of this waste stream, or 523,400 tons of solid waste, was disposed of in the county landfill. [38] **Exhibit 4.9-11** summarizes the documented amount of disposal and diversions for the Sonoma County Waste Management Agency in 2003.

[37] *Sonoma County Solid Waste Generation Study*, R3 Consulting Group and the Sonoma County Waste Management Agency, 2003.

[38] *Sonoma County Solid Waste Generation Study*, R3 Consulting Group and the Sonoma County Waste Management Agency, 2003.

Exhibit 4.9-11
Solid Waste Diversion and Disposal

Diversion Categories	***Tons of Documented Diversion***
Residential Curbside Recycling and Greenwaste (Franchises)	101,594.4
Buyback Centers	5,851.8
Drop-Off Centers	49,124.5
Commercial Recycling Programs	26,821.8
Grasscycling	3,657.0
Backyard Composting	3676.0
Business Audits – Source Reduction	939.1
Business Audits – Recycling	340,412.1
Business Audits - Composting	66,406.7
Sludge Composting and Land Application	3,708.0
Alternative Daily Cover	29,236.7
Construction and Demolition Collection and Drop-Off Programs	2,513.5
Scrap Metal	8,587.1
Subtotal 2003 Diversion	**642,528.7**
Disposal Summary	***Tons of Documented Disposal***
Total Disposal	544,757.0
Credit for Contaminated Soil Disposed at Central Landfill	-20,196.4
Credit for Indian Lands Waste	-1,153.2
Subtotal 2003 Disposal	**523,407.4**
Total Generation (Disposal + Diversion)	**1,165,936.1**
2003 Diversion Rate (Diversion / Total Generation)	**55.1 %**

Source: *Sonoma County Solid Waste Generation Study*, R3 Consulting Group and the Sonoma County Waste Management Agency, 2003

The existing solid waste management system in Sonoma County includes a mix of public and private sector haulers, facilities, and facility operators. Solid waste transfer and disposal facilities are owned by the County and serve the cities and unincorporated portions of the county. These include four transfer stations (Healdsburg, Annapolis, Guerneville, and Sonoma), the Central Disposal Site, and the Sonoma Compost Facility, which is located at the Central Disposal Site.[39] The County system is managed by the Sonoma County Integrated Waste Division of the Department of Transportation and Public Works. **Exhibit 4.9-12** shows the features and capacity of each facility.

[39] The Occidental Transfer Station was closed in January 2005.

The Central Landfill is the only operating landfill within Sonoma County. The landfill is owned by the County, and is permitted to accept up to 2,500 tons per day of non-hazardous municipal solid waste. Seventy-five percent of the waste disposed at the landfill is generated by the nine incorporated cities in the county. In 2003, the average daily tonnage was 1,433 tons per day.

Household hazardous wastes are those products that have the potential to harm people, animals or the environment.[40] A new permanent Household Toxic Waste Facility located at the Central Landfill opened in January 2005. Residents are able to drop-off toxics for free and qualifying small quantity business generators are charged hazardous waste disposal fees depending on material and quantity.[41]

Exhibit 4.9-12
Sonoma County Refuse Disposal Sites

Facility	Features	Service Areas	Capacity / Throughput		
			Permitted (Tons Per Day)	2000 Average (Tons Per Day)	2000 Total (Tons)
Annapolis Transfer Station	- Disposal - Recycling - Yard debris	Northwest Unincorporated County; Annapolis; Sea Ranch	50	12.6 (peak: 33 tons)	2,890 (9/99-8/00)
Healdsburg Transfer Station	- Disposal - Recycling	Northern Unincorporated County; Cloverdale; Healdsburg; Windsor; Geyserville	450	199.2 (1998 average)	71,500 (1998 total)
Guerneville Transfer Station	- Disposal - Recycling - Yard debris	Russian River Area Unincorporated County; Guerneville; Monte Rio	160	64.3	23,083
Sonoma Transfer Station	- Disposal - Recycling - Yard debris	Southeast Unincorporated County; Sonoma	760	247 (peak: 493 tons)	88,696
Central Landfill	- Disposal - Recycling/Reuse	Sonoma County only	2,500	1,378 (peak: 2,500 tons)	494,843
Sonoma Compost Facility	- Composting - Finished mulch & compost for sale to public	Sonoma County	300		55,300 (1999 total)

Sources: *Annual Report 2001,* Sonoma County Waste Management Agency; and *Sonoma County Solid Waste Management Alternatives Analysis Project, Final Report,* SCS Engineers, Sonoma County Department of Transportation and Public Works, December 29, 2000.

Of the total disposed waste, 60 percent is taken directly to Central Landfill; the remaining tonnage passes through the transfer stations. Although most of the yard wastes are composted at the County's green waste composting operation at Central Landfill, approximately 40 percent of the waste stream

40 Hazardous products have four classifications: flammable, poisonous, corrosive and reactive (explosive). Federal law requires that products with hazardous ingredients be labeled. The label also indicates the degree of hazard. In order of worst to least hazardous, the labels are: Poison, Danger, Warning, Caution and Precautionary statements.

41 *Household Toxics,* Sonoma County Waste Management Agency, accessed online at http://www.recyclenow.org/r_householdtoxics.html , December 2002.

disposed in the landfill consists of organic materials such as food, wood, textiles and paper. [42] **Exhibit 4.9-13** shows the breakdown of waste generation by sector and type of waste.

Exhibit 4.9-13
Waste Generation by Sector and Type

WASTE GENERATION BY SECTOR	
Residential	39.6 %
Commercial	32.5 %
Self-Haul Residential	12.6 %
Self-Haul Commercial	8.7 %
Mixed Residential / Commercial	6.8 %

WASTE GENERATION BY TYPE	
Other Organic	41.7 %
Paper	27.1 %
Other Inorganics	9.7 %
Plastics	7.8 %
Metals	7.6 %
Glass	3.6 %
Special Wastes	2.1 %
Household Hazardous	0.4%

Source: *Sonoma County Solid Waste Management Alternatives Analysis Project, Final Report,* SCS Engineers, Sonoma County Department of Transportation and Public Works, December 29, 2000.

In 1998, the County certified an EIR and approved an expansion plan for specific landfill construction projects, including the East Canyon and West Canyon areas. These expansions would provide an additional 3,300,000 tons of capacity accommodating the County's solid waste disposal needs through 2015. [43]

In May 2003, the County detected leachate and gas constituents beneath the landfill liner in the expansion area of the Central Landfill. This occurrence has delayed construction of expansion projects at the Central Landfill. Although this does not change the capacity estimates, it has changed when the capacity will be available. Landfill operations will be suspended in the fall of 2005, for a two to three year period. During the interim closure of the landfill, all waste received at county disposal sites will be transported to out-of-county landfill(s) with sufficient permitted capacity for disposal. Current efforts to identify the source of contaminants and remediate them, appear to be successful. The environmental impacts of the temporary out-haul are currently under study and the appropriate CEQA documents are in progress.

Solid Waste Management Services – Regulatory Setting

COUNTY REGULATIONS

The County approved an amended Countywide Integrated Waste Management Plan (CoIWMP) in 2003 which set forth solid waste planning strategies through the Year 2050. The 2003 CoIWMP is a

42 *Sonoma County Solid Waste Management Alternatives Analysis Project, Final Report,* SCS Engineers, Sonoma County Department of Transportation and Public Works, December 29, 2000.

43 *Central Disposal Site Improvement Program Final Environmental Impact Report*, URS Greiner Woodward Clyde, Sonoma County Department of Transportation and Public Works, December 8, 1998.

regional solid waste planning document for all of the nine Sonoma County cities and the unincorporated County area. [44]

STATE REGULATIONS [45]

The California Integrated Waste Management Board is one of the six agencies under the umbrella of the California Environmental Protection Agency (Cal / EPA). Its creation, authority, and responsibilities were shaped by two pieces of legislation (AB 939 and SB 1322) signed into law as the Integrated Waste Management Act of 1989. The Act established a new approach to managing California's waste stream, the centerpiece of which mandated goals of 25 percent diversion of each city's and county's waste from disposal by 1995 (accomplished), and 50 percent diversion by 2000 (not accomplished), along with a process to ensure environmentally safe disposal of waste that could not be diverted. The statewide diversion rate started at about ten percent in 1989 and reached 37 percent in 1999.

Legislation has been signed affording local jurisdictions time extensions to meet the diversion mandate. Senate Bill 1066, in particular, enables the Board to grant extensions of up to five years beyond 2000 to jurisdictions that are struggling to meet the mandate but have in place a plan to comply with the law within the period of the extension.

The Integrated Waste Management Act, along with Title 14 and Chapter 15 of California's environmental regulations, also provided the foundation to put the State on course to comply with federal standards (Subtitle D) for managing solid waste, including the design, construction and operation of landfills. In 1993, California became one of the first states to receive federal approval to assume authority over its solid waste activities, having actually exceeded the federal standards through the adoption of more stringent State regulations.

Solid Waste Management Services – Significance Criteria

According to the *State CEQA Guidelines*, the project would have a significant solid waste services impact if it would:

- Be served by a landfill with insufficient permitted capacity to accommodate the project's solid waste disposal needs; or
- Not comply with federal, State, and local statutes and regulations related to solid waste. **No significant impact**, **see *Appendix 7.4 Initial Study***.

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44 *Sonoma County Countywide Integrated Waste Management Plan*, Sonoma County Waste Management Agency, October 15, 2003

45 *The History of the California Environmental Protection Agency; Integrated Waste Management Board,* California Environmental Protection Agency, accessed online at http://www.calepa.ca.gov/about/History01/ciwmb.htm, December 2002.

Solid Waste Management Services – Impacts and Mitigation Measures

Impact 4.9-6 Increased Solid Waste Disposal Demand

Land uses and development consistent with the Draft GP 2020 would generate solid waste streams that would exceed the disposal capacity of the Sonoma County Central Landfill. After this date, the transport of solid waste to landfills outside of Sonoma County with sufficient permitted capacity would commence. Due to the lack of certainty regarding the county's future landfill capacity, this would be a significant impact. ***(S)***

The existing *General Plan* projected the solid waste disposal capacity of the Central Disposal Site (Central Landfill) would be exceeded in 2004. As a result, improvements to the Central Landfill proposed by the Sonoma County Department of Transportation and Public Works Integrated Waste Management Division were approved by the County in 1998. Such improvements would have provided capacity through 2015.

The 1998 environmental review of the Central Landfill expansion project identified several significant unavoidable project specific and cumulative impacts. [46] These included impacts associated with the conversion of agricultural land to a non-agricultural use, odor and air emissions of nitrous oxide and reactive organic gases, adverse visual impacts associated with litter and views from surrounding roads, and project specific and cumulative traffic impacts to intersections along Stony Point Road.

The 2003 environmental review of the Sonoma County CoIWMP also identified significant unavoidable impacts as well as cumulative impacts. [47] The approval of the 2003 CoIWMP included the adoption of mitigation measures and a statement of overriding concerns related to land use, soils and agricultural resources, hydrology and water quality, public safety, transportation, air quality, noise, vegetation and wildlife, and visual resources. [48]

Long-term planning goals and policies governing the reduction of solid waste disposal as well as the siting of additional facilities to meet capacity demand subsequent to 2015 are contained in the CoIWMP. The CoIWMP contains four elements including the Source Reduction and Recycling Element (SRRE), the Household Hazardous Waste Element (HHWE), the Non-Disposal Facility Element (NDFE), and the Siting Element.

The 2003 CoIWMP reflects a strategy that would reduce and divert the amount of solid waste by 50 percent from entering the landfill and provide adequate capacity for future demand through the expansion and / or construction of new landfill facilities. The CoIWMP strategy includes: (1) the expansion of the Central Landfill beyond its permitted capacity within site and regulatory constraints; (2) the siting of an integrated waste resource management facility which includes organics processing (i.e., anaerobic digestion or biorefining), green waste composting, and landfilling in order to further reduce waste stream volume; (3) the formal agreement among all cities and the County to direct flow

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46 *Sonoma County Central Disposal Site Improvement Program, Revision to Draft EIR*, Sonoma County PRMD, July 1998.

47 *Sonoma County Integrated Waste Management Plan Final Supplemental Program EIR*, Sonoma County Waste Management Agency, October 2003.

48 *Sonoma County Countywide Integrated Waste Management Plan*, Sonoma County Waste Management Agency, October 2003.

of refuse and green waste to the new integrated resource management facility; and (4) mandatory source separation of recyclables from the solid waste of residential, commercial, industrial, and institutional waste generators. [49]

At this time Sonoma County does not have flow control agreements in place with each of the cities. In April 2004, the City of Petaluma decided to direct their contracted garbage collection to deliver their waste to a private landfill.

Although the *Draft GP 2020* contains the broad enabling language for implementation of the CoIWMP, several of its policies pertain specifically to solid waste disposal. Policy **PF-2a** would appropriately scale future solid waste services by requiring such services be planned, designed, and constructed in accordance with projected growth consistent with the *Draft GP 2020* except as provided for in Policy **LU-4d**. Policy **PF-2b** directs the County to work with cities through mechanisms such as the CEQA process, annexations, and redevelopment and revenue sharing agreements which would generate fair share revenues from incorporated development projects to pay for disposal services.

Policies **PF-2r** and **PF-2s** encourage the agricultural application of wastewater sludge (i.e., biosolids) to enhance agricultural land uses while reducing the amount of such material requiring landfill disposal. While diverting this material from landfill disposal would be beneficial, this action would have no effect on the capacity of the Central landfill as no biosolids are currently disposed of there. Due to costs, it would be expected that all biosolids generated in Sonoma County that are not stored on-site, composted, or applied to agricultural lands would continue to be exported to the Redwood Landfill in Novato. [50] While a countywide estimate of biosolids production is not available, the Laguna Subregional Plant for example, which serves Santa Rosa, Rohnert Park, Cotati, Sebastopol and some unincorporated areas, generated approximately 36,600 wet tons (wt) of biosolids in 2003. Of this, approximately 16,000 wt were applied to agricultural lands, 11,000 wt were composted, and 9,500 wt were disposed of at the Redwood Landfill. [51] The County and Cities are in the midst of a feasibility study for a joint biosolids / Green Waste composting facility as part of the Waste Agencies Siting Study for a new compost facility.

The *Draft GP 2020* also contains policies to reduce impacts associated with incompatible land uses resulting from development projects being located adjacent to existing or new solid waste disposal facilities. **Policy PF-2p** requires review of projects located on or near designated solid waste facility sites. **Policy PF-2q** directs the County, when opportunity arises, to acquire lands adjacent to solid waste facilities as buffer zones. This would reduce local impacts, limit potential conflicts related to land use compatibility, and provide land for potential environmental mitigation.

In addition, the **Residential Use**, **Commercial Use**, and **Industrial Use** policies (sections 2.2 through 2.4 of the Land Use Element), policies **LU-2a**, **LU-3c**, **LU-3d**, **LU-5b**, **LU-5d**, **LU-6a**, as well as policies that pertain to specific Planning Areas, would reduce the need for additional solid waste

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49 *Solid Waste Facilities,* CAC memo, Denise Peter, Planner III, Sonoma County PRMD, November 21, 2002.

50 Nichols • Berman communication with Ken Wells, Integrated Waste Manager, Sonoma County Department of Transportation and Public Works, June 2004.

51 Nichols • Berman communication with Bob Swift, Senior Environmental Health Specialist, Department of Health Services - Solid Waste Local Enforcement Agency, June 2004.

disposal facilities by maintaining low residential densities and limited commercial and industrial development outside of the USAs.

As previously discussed, the County approved an expansion plan for the landfill in 1998 which included over 3,300,000 tons of additional capacity that would be sufficient to meet solid waste disposal needs through the year 2015. In 2003, an amended CoIWMP was approved by the County and Cities, which determined that expansion of the Central Landfill could provide capacity through the Year 2015. The CoIWMP further indicated that with additional land acquisition adjacent to the landfill and expansion combined with new recycling and waste transformation technology the Central Landfill could conceptually provide disposal capacity through the Year 2050. Because the CoIWMP identified sufficient onsite disposal capacity through 2015, it deferred discussion of disposing of solid waste offsite. It noted that it would discuss issues related to offsite disposal in future reviews "when it is clear that the Central Disposal site has reached full capacity, and there are no new sites available for establishing new disposal or transformation capacity".

Additionally, the County has recently detected leachate and gas constituents beneath the liner in the expansion area of the Central Landfill. Current efforts to identify the source of contaminants and remediate them appear to be successful. This occurrence has delayed construction projects at the Central Landfill. Although this does not change the capacity estimates, it has changed when the capacity would be available. Landfill operations will be suspended in the fall of 2005, for a two to three year period while construction plans are being revised and the appropriate agency approvals are being obtained. During the interim closure of the landfill, all waste received at county disposal sites will be transported to an out-of-county landfill with sufficient permitted capacity for disposal. The County has identified at least 11 potential out of county landfill sites.

As a result of the delay of construction projects to expand landfill capacity (as described in the Environmental Setting section), increased regulatory compliance costs, and the loss of the waste stream from the City of Petaluma, the Solid Waste disposal system has suffered financially. As a result, the County has hired a consultant to reassess the long-term waste plan as established in the 2003 CoIWMP and make recommendations to the County Board of Supervisors as to whether the existing plan is still feasible or whether it needs to be modified in order to maintain an environmentally sound and cost-effective system for the County and cities of Sonoma County. The results of this re-assessment are not available at this time, and therefore, no policy decisions to deviate from the current 2003 CoIWMP have been made.

If the re-assessment clearly finds that the landfill has reached its full capacity in consideration of recent changes in circumstances related to fiscal, environmental, and regulatory requirements, then in accordance with Section 6.7 of the CoIWMP, new long term disposal strategies would be developed and the CoIWMP amended.

In conclusion, future land fill capacity remains uncertain. As a result, future land uses and development consistent with the *Draft GP 2020* would generate solid waste streams that would require that either additional capacity be located and permitted within the county, or that solid waste be transported to an undetermined permitted-site outside of the county. This lack of sufficient and permitted solid waste disposal capacity would represent a significant impact. The following mitigation measure would therefore be required.

Mitigation Measure 4.9-6 Add a policy to the Public Facilities and Services Element that would provide guidance to the County Integrated Waste Management Plan to provide for future landfill capacity needed to meet the county's future demands for waste disposal.

> Policy **PF-2bb**: Amend the County Integrated Waste Management Plan as necessary to continue to address potential shortfalls in future landfill capacity.

Significance After Mitigation Adoption of this policy may reduce solid waste impacts associated with insufficient capacity. However, due to the described uncertainties in future land fill capacity, it would not reduce them to a less-than-significant level. Therefore, this would remain a significant unavoidable impact. (**SU**)

Responsibility and Monitoring The Sonoma County Board of Supervisors would be responsible for adopting this policy as part of the *GP 2020*.

Parks and Recreation Services – Environmental Setting

Within Sonoma County there are two State Park Districts, the United States Army Corps of Engineers (Corps) Lake Sonoma Recreation Area, the County Regional Park System, the park and recreation departments of five cities, and three special park districts that together provide a variety of parklands serving both residents and visitors. In addition, there are a handful of facilities operated by private non-profit organizations. **Exhibit 4.9-14** provides a summary of publicly accessible acreage in Sonoma County. Approximately two-thirds of the accessible land is provided by State Park Districts, with the Corps (Lake Sonoma) and the County Parks Department the other major providers.

Exhibit 4.9-14
Publicly Accessible Lands in Sonoma County, 2000

Agency	*Acres*
Federal	14,865
State	31,604
County	4,331
City	1,005
Local Recreation District	47
School District	905
Others [a]	106
Total	***52,863***

[a] Includes non-profit organizations and homeowners associations that provide recreation facilities.

Source: *Draft Sonoma County Outdoor Recreation Plan,* Sonoma County Regional Parks Department, Water Agency, and Agricultural Preservation and Open Space District, March, 2003.

Exhibit 4.9-15 is a matrix of the four main types of outdoor recreation facilities, showing existing acres, acreage per 1,000 residents, and the primary characteristics of each type of facility. Parklands are classified as Community and Neighborhood Parks, Regional Recreation Areas, Regional Open

Space Parks, and Other Lands, depending on the size, location, and other characteristics of the park lands. [52]

The relative increase in visitor use has increased faster than county population over the past decade, indicating that the latent demand for outdoor recreation facilities may exceed that of population growth. User trends also indicate high levels of visitor use of Sonoma County Regional Park facilities; total visitor use of all County owned and operated outdoor recreation facilities increased 66 percent from 11,562,148 in 1988 / 89 to 2,599,619 in 1996 / 97. Total visitor use in all categories has increased, with the highest increases on Regional Trails from 4.2 percent to 12.1 percent of total visitors and Open Space Parks, from 7.5 percent to 12.7 percent of total visitors in the nine year period studied. Public desires surveyed in 1995 indicate that future acquisition and development of County park facilities should emphasize open space, trails, and other forms of passive recreation. [53]

In 2003, the Sonoma County Regional Parks Department, in partnership with the Sonoma County Agricultural Preservation and Open Space District (SCAPOSD) and the Sonoma County Water Agency, published the *Draft Outdoor Recreation Plan* (*Draft ORP*) to help guide future public outdoor recreation in Sonoma County. The *Draft ORP* contains a parkland needs assessment for the year 2010 for the six Park Planning Areas for use by the SCAPOSD, the SCWA, and the Regional Parks Department for planning purposes. Although the *Draft ORP* has yet to be adopted, it recommends proposed expansions of existing recreation areas and open space parks, new regional parks, new open space parks, trails, neighborhood / community parks, as well as recommendations for State and federal parks and preserves.

The *Draft ORP* uses the same boundaries for the Park Planning Areas as does the County for its Planning Areas but in some cases combines the County Planning Areas. For example, the North County Park Planning Area is comprised of the County's Cloverdale and Healdsburg Planning Areas.

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52 Other Lands include State Parks, Federal Parks, and Preserves, and are areas with significant natural or cultural features or resources that merit preservation for public enjoyment and education. State and federal lands generally protect areas with National or State-wide significance. Essential features of a Preserve may be wilderness or other natural or historic resources where recreation is not the dominant use. These lands may vary in size.

53 *Draft Sonoma County Outdoor Recreation Plan,* Sonoma County Regional Parks Department, Water Agency, and Agricultural Preservation and Open Space District, March 2003.

Exhibit 4.9-15
Outdoor Recreation Plan Parkland Classification Matrix

Facility Type	*Existing Acreage*	*Acres per 1,000 pop* [a]	*Service Area*	*Primary Providers*	*Defining Characteristics*
Community & Neighborhood Parks	1,998	5	< 30 minute drive	• Non-profit organizations • Public Schools • Cities • County Service Area • Special Districts	• ≤ 25 acres • Play Areas • Sports Fields • Picnicking
Regional Recreation Area	1,181	5	30-60 minute drive	• County	• >25 acres • usually ± 200 acres • 10% of the area active recreation
Regional Open Space Parks	3,105	15	Region	• County	• ≥ 200 acres • Resource Management • Public Access
Other Lands	46,469	n/a	Nation, State, Region	• Federal Agencies • State Agencies • Non-profit organizations	• State and federal Parks or Preserves • State-wide or nationally significant lands • Preserves offer limited access

[a] There are a variety of guidelines for determining parkland needs for any given population. Generally, guidelines relate to the "number of acres per thousand population" for different types of parkland.

Source: *Draft Sonoma County Outdoor Recreation Plan,* Sonoma County Regional Parks Department, Water Agency, and Agricultural Preservation and Open Space District, March 2003.

Parks and Recreation Services – Regulatory Setting

COUNTY REGULATIONS

Acquisition of land for and construction of parks and recreation facilities in the unincorporated area is subject to County review for consistency with the Sonoma County General Plan under Section 65402 of the Government Code. While many public agency sponsors will strive to develop facilities that are consistent with the General Plan, they have the authority to override the County's determination and proceed with acquisition and construction.

The Open Space and Public Facilities and Services Elements of the existing *General Plan* govern the development of County Parks and Trails. The existing *General Plan* uses the National Recreation and Parks Administration standards as the minimum Standards for determining Park needs. The National Recreation and Parks Association (NRPA) Guidelines have been among the most commonly used guidelines over the last two decades and were used as a starting point for the guidelines used in the *Draft ORP*.

Following the hearings of the Planning Commission and the Board of Supervisors, if an Outdoor Recreation Plan is adopted, its recommendations would be incorporated into the *GP 2020* through the passage of a General Plan amendment as well as necessary amendments to Area and Specific Plans and the Local Coastal Plan.

The following agencies would be responsible for implementing the adopted Outdoor Recreation Plan. The Sonoma County Regional Parks Department is charged with acquiring, developing, and managing regional parks and trails and community parks in the unincorporated portion of Sonoma County. The

Sonoma County Water Agency (SCWA) owns several recreation sites in Sonoma County including: Spring Lake Park, Wohler Bridge Fishing access, Russian River access, the Brush Creek Reservoir and others. In addition, some of the SCWA flood control channel maintenance roads are currently used by the public as trails. Finally, the Sonoma County Agricultural Preservation and Open Space District preserves agricultural land use and opens space primarily through the purchase of development rights using funds generated from a voter approved sales tax.

Parks and Recreation Services – Significance Criteria

According to the *State CEQA Guidelines*, the project would have significant parks and recreation services impact if it would:

- 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; or

- Include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment.

Parks and Recreation Services – Impacts and Mitigation Measures

Impact 4.9-7 Increased Demand for Parks and Recreation Services and Facilities
Implementation of the Draft GP 2020 would require new or expanded Community and Neighborhood Parks, Regional Recreation Areas, and Regional Open Space Parks in order to achieve recognized park planning standards. The construction of these facilities could result in adverse physical effects on the environment. This would be a significant impact. ***(S)***

Analysis of impacts to park and recreational facilities from implementation of the *Draft GP 2020* relies on the parkland needs assessment contained in the *Draft ORP*. **Exhibit 4.9-16** summarizes the existing acreage of Community and Neighborhood parks, Regional Parks (including County Open Space and Regional Recreation Areas) as well as the demand for new facilities to achieve recognized park planning guidelines described in **Exhibit 4.9-15**.

The 2020 demand for community and neighborhood parks was evaluated based upon a projected unincorporated population of 147,660 persons. Based on a guideline of five acres per 1,000 persons, a total of 738 acres of community and neighborhood parks would be required to achieve this guideline. Therefore, implementation of the *Draft GP 2020* would result in a deficit of 377 acres of such park facilities. All six of the Park Planning Areas would have need of additional community and neighborhood park facilities with Park Planning Area 4 (Santa Rosa) showing the greatest deficiency. [54]

The 2020 demand for both Regional Park lands including Regional Recreation Areas (active recreation) and Regional Open Space Parks (passive recreation) was evaluated based on the total

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54 *Draft Sonoma County Outdoor Recreation Plan*, Sonoma County Regional Parks Department, March 2003.

projected county population (unincorporated and incorporated areas) of 546,030 persons. According to the acreage guideline of five acres per 1,000 persons for Regional Recreation Areas, 2,730 acres of Regional Park lands would be required to achieve this guideline. Therefore, implementation of the *Draft GP 2020* would result in a deficit of 1,549 acres of such park lands by 2020. All Park Planning Areas except the Sonoma Coast demonstrate a need for additional facilities with projected demand for such facilities being greatest in the Santa Rosa and Sonoma Valley Park Planning Areas. `

Exhibit 4.9-16
Parkland Needs Assessment for 2020

Park Type and Guidelines	Population 2020	Existing Parks 2001 (Acres) [a]	Additional Park Land Required by 2020 (Acres)	Acreage Required to Meet Guideline in 2020 (Acres)	ORP Proposed Parks (Acres) [a]
Regional (Unincorporated and Cities)					
Open Space Parks (15 acres/1,000 pop.)	546,030	3,105	5,085	8,190	9,145
Regional Recreation Areas (5 acres/ 1,000 pop.)	546,030	1,181	1,549	2,730	3,094
Community and Neighborhood Parks (Unincorporated Area Only)					
Parks [b]	147,660	361	377	738	760

a Draft ORP estimates of existing parkland and proposed park acreage.

b Comprised of County Parks, School sites, and Other (Non-profits, Special District, ,and Homeowners Associations

Source: *Draft Sonoma County Outdoor Recreation Plan,* Sonoma County Regional Parks Department, Water Agency, and Agricultural Preservation and Open Space District, March 2003.

Similarly, 8,190 acres of Regional Open Space Parks would be required by 2020 to meet the acreage guideline of 15 acres per 1,000 persons. Therefore, implementation of the *Draft GP 2020* would result in a deficit of 5,085 acres of Regional Open Space Parks by 2020. Nearly all of the six Park Planning Areas would have need of additional facilities with projected demand for such park lands being greatest in the Santa Rosa and Sonoma Valley Park Planning Areas. As previously mentioned, if an Outdoor Recreation Plan is adopted and implemented, its policies and recommendations for additional parklands would be incorporated into the *GP 2020* through passage of a General Plan amendment as well as necessary amendments to Area Specific Plans and the Local Coastal Plans (LCP). [55]

The *Draft ORP* recommended a number of projects that would result in the development of 399 additional acres of Community and Neighborhood Parks throughout all six Park Planning Areas. If

55 *Draft Sonoma County Outdoor Recreation Plan*, Sonoma County Regional Parks Department, March 2003.

adopted and implemented, this would bring the total amount of such facilities to 760 acres and would exceed the amount necessary to satisfy the five acres per 1,000 persons guideline through 2020. [56]

Draft ORP recommended projects would also result in the development of 1,913 additional acres of Regional Recreation Areas throughout all six Park Planning Areas. If adopted and implemented, this would bring the total amount of such lands to 3,094 acres and would exceed the amount necessary to satisfy the five acres per 1,000 persons guideline through 2020.

Similarly, the *Draft ORP* recommended a number of projects that would result in the development of 6,040 additional acres of Regional Open Space Parks throughout all six Park Planning Areas. If adopted and implemented, this would bring the total amount of such lands to 9,145 acres and would exceed the amount necessary to satisfy the five acres per 1,000 persons guideline through 2020.

In addition, the *Draft ORP* proposes 63 new or expanded trails within the unincorporated portion of Sonoma County. Such projects, if adopted and implemented, would increase trail mileage from a 2001 level of 31 miles, to a 2010 level of 490 miles, or 0.91 miles per 1,000 persons. [57] Population increases through 2020 would slightly reduce this ratio to 0.90 miles per 1,000 persons. Unlike parks, there is no guideline with respect acreage or mileage per unit of population.

However, as the *Draft ORP* is currently being updated, there is no guarantee that it will be adopted or that its recommended projects would be realized. Therefore, this analysis assumes that implementation of the *Draft GP 2020* would result in deficiencies in parkland acreages for its residents by 2020.

In order to meet the future demand for parks and recreation services, additional facilities will need to be constructed. Construction of these facilities may result in a range of environmental impacts, including traffic, loss of agricultural lands, erosion and sedimentation, and noise and dust associated with construction activities. In general, the impacts of parks and recreation uses are evaluated at a program level throughout this EIR since these uses are considered to be part of the land uses and development consistent with the *Draft GP 2020*. The site specific impacts of these facilities cannot be determined until such time that they are proposed and undergo environmental review.

However, the *Draft GP 2020* includes a number of policies and programs that would help reduce potential impacts related to the construction of needed parks and recreation facilities. For example, Policy **OSRC-8c**, would reduce potential impacts to riparian corridors by requiring future development be sited to a minimum of 50 feet (or up to 200 feet in certain circumstances) from the top of banks f streams. Policies **OSRC-11b** and **WR-1h** would reduce potential water quality impacts due to erosion at construction sites. The policies require including control measures for projects involving construction or grading near waterways or on steep slopes and that grading plans include measures to avoid soil erosion and sedimentation in storm water to the maximum extent practical. Policy **OSRC-16c** would, through project review by the local air quality district, help minimize air pollution. In

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56 While the *Draft Outdoor Recreation Plan* has a time horizon for implementation of projects through 2010, it is recognized that some projects would be developed through 2020. Recommended projects (i.e., total acreage) for each park category would exceed acreage guidelines for the projected 2020 population and would not likely require the construction of additional facilities.

57 *Draft Sonoma County Outdoor Recreation Plan*, Sonoma County Regional Parks Department, March 2003.

addition, the *Draft ORP* includes a range of mitigation measures that if adopted and implemented, may reduce the impacts of development and use of parks and recreational facilities.

Implementation of the *Draft GP 2020* would result in deficiencies in parkland acreage and require new or expanded parks and recreational services / facilities; the construction of which could result in adverse physical effects on the environment. This would be a significant impact. The following mitigation would be required.

Mitigation Measure 4.9-7 Add a new policy to the Public Facilities and Services Element as follows:

> Policy **PF-2cc** Adopt and implement an Outdoor Recreation Plan with parks and recreation facilities necessary to meet the needs of the *Draft GP 2020*.

Significance After Mitigation While these policies and mitigation measure 4.9-7 would reduce these impacts, adoption of an Outdoor Recreation Plan cannot be assured, and the impacts of construction of new facilities cannot be determined at a site-specific level. As a result this would be a significant unavoidable impact. (**SU**)

Responsibility and Monitoring The Sonoma County Board of Supervisors would be responsible for adopting this policy as part of the *GP 2020*. The Regional Parks Department would be responsible for acquisition, design, planning and development of County parks and recreation facilities.

Public Education Services – Environmental Setting

There are 40 school districts in Sonoma County: 31 elementary districts, three high school districts, and six unified districts.[58] The districts vary significantly in size, ranging in enrollment from 12 students in the smallest district to over 12,000 in the largest. There are 169 public schools in Sonoma County, including 92 elementary schools, 20 middle / junior high school, 15 high schools, 29 alternative schools,[59] and 20 charter schools.[60] From 1992 to 2001 K-12 enrollments increased steadily in Sonoma County's public schools. The 1992-92 enrollment was 64,854, which grew to 73,991 in 2000-01, and declined to 72,991 students in 2001-02.[61] Enrollment increased slightly in 2002-03 to 73,045. The State Department of Finance has projected that public k-12 school enrollment in the county will range from 72,597 in 2003-04, to 72,555 in 2012-13. The growth rate statewide has

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58 Horicon and Kashia are unique in that these elementary districts feed into an out-of-county district, Point Arena Joint Union High School District in Mendocino County.

59 Alternative schools include one upgraded special education school, eight continuation schools, ten necessary small schools, five community day schools, two independent study schools, one magnet school, and two countywide programs.

60 Twenty locally approved charted schools enrolled students in 2005. Two additional charter schools, approved by districts in other counties, are currently operating in Sonoma County.

61 *Sonoma County Education Facts 2002,* Sonoma County Office of Education, accessed online at http://www.scoe.org/schools/pdf/scfacts_2002.pdf , December 2002.

subsided since 1996 and is expected to continue to slow chiefly because smaller birth cohorts are entering school. [62]

The average class size for Sonoma County public schools in 2000-01 was 25.7, as compared to the state average of 26.5. The racial and ethnic makeup of the students showed that 65.7 percent of the students were in the ethnic majority, with 34.2 percent in the ethnic minority. [63] Average expenditures per student for academic year 2000-01 were $7,247. [64] **Exhibit 4.9-17** details countywide funding sources for the 2000-01 academic year. The availability of classrooms and new school facilities is influenced not only by population growth and location, but also by the amount of State funding available to school districts, in addition to other factors. When school revenue is reduced, as is occurring in 2003, average classroom sizes increase because there is less revenue available for teacher salaries and the number of teachers must be reduced. School modernization needs will continue to rely on several sources, including state bonds, local bonds, special taxes, and developer fees.

Exhibit 4.9-17
Countywide General Fund Income by Source for K-12 Education 2000-01

Source	Amount ($)	Percent
State	245,099,806	43.3
Property Taxes	205,217,642	36.3
Federal	22,236,907	3.9
Other	93,100,914	16.5
Total	***565,655,269***	***100***

Source: *Sonoma County Education Facts 2002,* Sonoma County Office of Education, *http://www.scoe.org/schools/pdf/scfacts_2002.pdf,* December 2002.

Charter Schools

In the last decade the charter school movement has grown in California and across the country. The first charter school law was passed in Minnesota in 1992 and California was the second state to enact charter legislation the same year. A charter school is a public school and may provide instruction in any of grades K-12. A charter school is usually created or organized by a group of teachers, parents and community leaders or a community-based organization and is usually sponsored by an existing local public school board or county board of education. Specific goals and operating procedures for the charter school are detailed in an agreement (or "charter") between the sponsoring board and charter organizers to operate the school for a fixed period of time (generally 5 years). A charter school is

62 *Projected California Graded Public K-12 School Enrollment by County By School Year*, Demographic Research Unit, State Department of Finance, accessed online at http://www.dof.ca.gov/HTML/DEMOGRAP/K12G.HTM.

63 Racial and Ethnic Diversity of K-12 Students, 2001-02: 65.7 percent White, 1.3 percent Native American, 2.5 percent African American, 4.8 percent Asian, Pacific Islander and Filipino, 24.3 percent Hispanic, 1.3 percent Multiple Response.

64 *District Information*, Sonoma County Office of Education, accessed online at http://www.scoe.org/schools/charts/districtchart.html December 2002.

generally exempt from most laws governing school districts, except where specifically noted in the law. [65] [66]

The first charter school in Sonoma County was opened in 1994 and there are now currently 20 charter schools in Sonoma County, mostly enrolling kindergarten and elementary school students. The schools range in size from 33 students (the Kid Street Charter School in Santa Rosa) to 600 students (the Pathways Charter School in Occidental).

Public Education Services – Regulatory Setting

COUNTY REGULATIONS

Acquisition of land for and construction of public education facilities in the unincorporated area is subject to County review for consistency with the Sonoma County General Plan under Section 65402 of the Government Code. While many public agency sponsors will strive to develop facilities that are consistent with the General Plan, they have the authority to override the County's determination and proceed with acquisition and construction.

STATE REGULATIONS

The California Department of Education (CDE) administers California's public education system at the State level and the State Board of Education, by statute, is the governing and policy-determining body of the CDE. Among other things, the Board adopts rules and regulations for the government of the state's public schools, adopts curriculum frameworks in core subject-matter areas, approves academic standards for content and student performance in the core curriculum areas, and adopts tests for the Standardized Testing and Reporting (STAR) program and the California High School Exit Examination.

Public Education Services – Significance Criteria

According to the *State CEQA Guidelines*, the project would have a significant public education services impact if it would:

- Result in substantial adverse physical impacts associated with the provision of new or physically altered educational facilities, the need for new or physically altered educational facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios or other performance objectives for any public education services.

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65 *About Charter Schools,* California Department of Education, accessed online at http://www.cde.ca.gov/charter/about.html , December 2002.

66 *Frequently Asked Questions About Charter School Fundamentals,* Charter Schools Development Center, accessed online at http://www.csus.edu/ier/charter/faqs.html , December 2002.

Public Education Services – Impacts and Mitigation Measures

Impact 4.9-8 Demand for Public Education Services

Implementation of the Draft GP 2020 would not generate a substantial demand for school services beyond the existing public school capacity and would not result in the need for additional facilities. This would be a less-than-significant impact. ***(LTS)***

This analysis is based upon PRMD's research with the County Office of Education, as well as data from the State Department of Finance. Based on both sources, enrollment in Sonoma County schools in the unincorporated area would be expected to decline through 2020. The projected number of K-12 students within the unincorporated portion of Sonoma County is summarized for each of the nine planning areas in **Exhibit 4.9-18**. Also, as previously noted in the environmental setting, projections for K-12 students by the State Department of Finance are expected to decline from 72,597 students in 2003 / 2004 to 71,548 students in 2009 / 2010 before increasing slightly to 72,555 students in 2012 / 2013.

As shown in **Exhibit 4.9-18**, declining enrollments of approximately two to four percent are expected to occur within the Sonoma Coast, Cloverdale, Russian River, Santa Rosa, Sebastopol, and Petaluma Planning Areas. Increases in enrollment would be expected to occur in the Healdsburg, Rohnert Park – Cotati, and Sonoma Valley Planning Areas, however; it is unclear exactly how the projected increases would impact any specific grade levels, schools, or districts due to the general nature of the information available.

Exhibit 4.9-18
Existing and 2020 Projected Student Enrollment

Planning Area	*Baseline Number of Students (K-12)*	*2020 Projected Number of Students (K-12)*	*Percent Change*
Sonoma Coast	1,284	1,242	-3.3
Cloverdale	1,123	1,089	-3.0
Healdsburg	2,776	2,845	+2.5
Russian River	2,772	2,689	-3.0
Santa Rosa	6,073	5,840	-3.8
Sebastopol	2,225	2,187	-1.7
Rohnert Park - Cotati	1,922	2,260	+17.6
Petaluma	607	594	-2.1
Sonoma Valley	1,715	1,735	+1.2
Totals	**20,497**	**20,481**	**-0.0**

Sources: *Planning Area Data by Traffic Assignment Zones*. Sonoma County PRMD, September 5, 2001.

The Sonoma County Office of Education anticipates increased school closures resulting from declining enrollments throughout the county. [67] Recent school closures include the Richard Crane Elementary School in Rohnert Park and the Harmony Elementary School in Occidental. While the Office assists the School Districts in projecting student enrollment, it is difficult to predict school enrollment on an annual basis, particularly a decline in enrollment. Therefore, currently it is not possible to determine which schools may close within a certain time frame or by 2020. [68]

The *Draft GP 2020* does contain policies related to Public Education Services. Policies **PF-2a**, **PF-2b**, and **PF-2j** through **PF-2l** would encourage school planning to meet the needs of future residents.

Given the available data, as illustrated in **Exhibit, 4.9-18**, the overall decline in student population would not result in the need for new or expanded public schools as capacity and service standards would not reasonably be expected to be adversely affected by implementation of the *Draft GP 2020*. This would be a less-than-significant impact.

Mitigation Measure 4.9-8 None required.

67 Land Use Element - Reuse of Public Properties, CAC memo, Lisa Posternak, Sonoma County PRMD, January 16, 2002.

68 Nichols • Berman communication with Patty Bernstein, Sonoma County Office of Education, July 2004.

Fire Protection & Emergency Services – Environmental Setting

Fire Protection Agencies

Fire protection in Sonoma County is provided by a total of at least 29 different agencies. There are 15 Volunteer Fire Companies that comprise Community Service Area 40 (CSA 40). CSA 40 is funded primarily through donations, with equipment and administrative support provided by the County Department of Emergency Services. There are 17 Fire Protection Districts (FPDs) funded through County taxes and operated by the Fire Division of the Department of Emergency Services. In addition, the cities of Cloverdale, Healdsburg, Petaluma, Santa Rosa, Sebastopol, and Sonoma operate independent Fire Departments funded through local property taxes. The Occidental and Cazadero County Service Districts (CSDs) fund fire protection services. Four other agencies provide fire protection through other means: the Sonoma Developmental Center's 1600 acre campus provides its own fire protection; the Two Rock Coast Guard provides its own fire protection; the Rohnert Park's fire protection is provided by the Rohnert Park Department of Public Safety; and additional fire protection services in the unincorporated parts of the county are provided by the California Department of Forestry and Fire Protection (CDF). [69]

Wildland Fires

The CDF has mapped areas in Sonoma County with the potential for large wildland fires. Areas with "very high or high potential for wildland fires" include over half of the county. The highest potential for large wildland fires is in the mountainous areas where there is an abundance of fire fuel vegetation and fire potential is enhanced by steeper slopes. [70]

In the period between 1989 and 2000 there were 21 wildland fires over 100 acres in size in Sonoma County. Nine fires were between 100 and 200 acres, nine fires were between 200 and 1,000 acres, and the remaining three fires ranged from 1,200 to 6,125 acres. Ninety seven percent of the wildland fires over 50 acres since 1989 were caused by human activities or facilities. [71]

Emergency Services

The Emergency Medical Services (EMS) system in Sonoma County is a blend of first responder agencies, ground and air ambulance providers, EMS - Fire Dispatch Center, and acute care receiving facilities. The County's EMS system contains an Exclusive Operating Area (EOA) ambulance franchise, assessment district ambulance providers, fire department based ambulance providers, privately owned ambulance providers, a privately owned air ambulance (helicopter) service, and a law enforcement based ALS rescue helicopter. Additionally, the County's EMS system has one of the State's only public-private partnership based EMS - Fire Dispatch Centers which provides Emergency

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69 Nichols • Berman communication with Teresa Russo, Sonoma County Department of Emergency Services, December 2002.

70 *Public Safety Element – Fire Hazards,* CAC memo, Lisa Posternak, Sonoma County, June 20, 2002.

71 *Public Safety Element – Fire Hazards,* CAC memo, Lisa Posternak, Sonoma County, June 20, 2002.

Medical Dispatch (EMD) instructions to callers utilizing the 9-1-1 system. The County's EMS system also has a Level II Trauma Center (Santa Rosa Memorial Hospital) among its eight acute care hospitals. [72]

Requests for emergency medical care are routed through jurisdictional Public Safety Answering Points (PSAP), also known as dispatch centers, to the EMS - Fire Dispatch Center (Redwood Empire Communications Authority [REDCOM]), which is run by American Medical Response (AMR) through a contract with the REDCOM Joint Powers Authority. The PSAP dispatch centers relay medical assistance requests (as well as fire related calls) to the REDCOM Dispatch Center. REDCOM directly dispatches the following: Bell's Ambulance Service (north central), Bodega Bay FPD (southwest), Coast Life Support District (north coast), Russian River FPD (Guerneville area), City of Sonoma Fire Department (east county), and Sonoma Life Support. Cloverdale Ambulance Service and Petaluma Fire Department are dispatched by Cloverdale and Petaluma, respectively. Overall, the EMS system in Sonoma County is currently providing adequate response and patient care to those citizens requesting emergency medical care through the 9-1-1 system. [73] However, the system is operating at peak efficiency and any population growth would necessitate matching growth in services offered. [74]

Fire Protection & Emergency Services – Regulatory Setting

COUNTY REGULATIONS

Acquisition of land for and construction of fire and emergency services facilities in the unincorporated area is subject to County review for consistency with the Sonoma County General Plan under Section 65402 of the Government Code. While many public agency sponsors will strive to develop facilities that are consistent with the General Plan, they have the authority to override the County's determination and proceed with acquisition and construction.

The Sonoma County Department of Emergency Services enforces Fire Safe Standards for new residential or commercial building in unincorporated State Responsibility Areas. A booklet titled *Vegetation Management Planning Requirements* informs permit applicants about compliance with the Vegetation Management section of the fire standards. An on-site fire hazard assessment and consultation conducted by Department of Emergency Services' staff is required. The staff assessment results in a report describing the minimum requirements for the project's Vegetation Management and Defensible Space Plan.

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72 *2002 Annual Report on Emergency Medical Services*, Coastal Valleys EMS Agency, 2002.

73 *2002 Annual Report on Emergency Medical Services*, Coastal Valleys EMS Agency, and Nichols • Berman conversation with Mike Duvall, Sonoma EMS Coordinator, Coastal Valleys Regional EMS Agency, March 21, 2003.

74 Nichols • Berman communication with Mike Duvall, Sonoma EMS Coordinator, Coastal Valleys Regional EMS Agency, March 2003.

Sonoma County Ordinances 5373 and 5402 require the installation of automatic fire sprinkler systems in all new residential and commercial buildings and conditionally require such systems at the time of the expansion of existing residential and commercial buildings. [75]

Fire Protection & Emergency Services – Significance Criteria

According to the *State CEQA Guidelines*, the project would have a significant fire protection and emergency services impact if it would:

- Result in substantial adverse physical impacts associated with the provision of new or physically altered fire protection and emergency facilities, the need for new or physically altered fire protection and emergency 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 and emergency services; or

- Expose people or structures to risk of loss, injury, or death involving wildland fires.

Fire Protection & Emergency Services – Impacts and Mitigation Measures

Impact 4.9-9 Increased Demand for Fire Protection and Emergency Services Facilities
Implementation of the Draft GP 2020 would increase the demand for fire protection and emergency services and require the construction of new or expanded fire protection and emergency services facilities. This would be a significant impact. ***(S)***

There is no single master facilities plan or other comprehensive long range planning document that addresses the need for new fire or emergency services. The lack of available planning data makes quantifying the demand for fire and emergency facilities difficult. However, there is an ongoing effort by providers to consolidate fire services in order to improve efficiency and reprioritize funding from administration functions to service delivery.

The ability of County Department of Emergency Services (DES) to maintain acceptable response times within CSA 40 would be adversely affected by implementation of the *Draft GP 2020.* Declining funding combined with several trends including increasing costs such as insurance premiums and workers compensation, and more stringent State requirements pertaining to volunteer training and minimum availability, has made the retention of volunteers and paid staff increasingly difficult. Such difficulties will likely reduce the number of volunteer companies from 15 to ten or eight within five years and could mean an end to volunteer fire companies altogether. [76] The ability to provide emergency services within CSA 40 is already at a deficit with low levels of staffing and average response times between 20 to 30 minutes. Response to emergency calls within Sonoma County

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[75] Ordinances 5373 and 5402 became effective on May 27, 2003.

[76] Nichols • Berman communication with Vern Losh, Director, and Jack Rosevear, Fire Marshall, Department of Emergency Services, September 2004.

generally requires the dispatch of multiple agencies in all areas outside the City of Santa Rosa. [77] In addition, the duplication of services by multiple agencies in some areas contributes to deficiencies in services provided in other areas. [78]

Land uses and development consistent with the *Draft GP 2020* in the unincorporated area and especially within CSA 40, would exacerbate these deficiencies. While it would be reasonable to assume that providing fire and emergency services in CSA 40 areas would increasingly become the responsibility of the 17 neighboring Fire Protection Districts or that of newly formed ones, it is not entirely clear how increased demand for services may result in the need for new or expanded emergency services facilities. If Fire Protection Districts were required to widen their service areas, then the expansion of their existing facilities could be required. If new districts are formed, the construction of new facilities could be required in CSA 40 areas as volunteer fire companies do not own the facilities from which they operate. These facilities range from leased buildings to barns, to the homes of its volunteers. [79]

The *Draft GP 2020* contains policies in both the Public Safety and Public Services and Facilities Elements that would provide funding and reduce some of the demand for new or expanded fire and emergency services facilities. Policies **PF-2a** and **PF-2b** require that fire and emergency services be planned, designed, and constructed in accordance with projected growth and coordinated with that of the cities of Sonoma County. Policies **PF-2f** and **PS-3n** would require the dedication of land or in-lieu fees and consider additional impact or mitigation fees, to offset the cost of providing services to new development. Policy **PF-2m** would prepare a Fire Services Master Plan which would likely reduce current problems associated with the duplication of services and identify the need for new or expanded facilities required to maintain acceptable service ratios and response times. Policy **PF-2n** would deny the approval of discretionary projects if fire and emergency services are not sufficiently available.

In addition, the **Residential Use**, **Commercial Use**, and **Industrial Use** policies (sections 2.2 through 2.4 of the Land Use Element), policies such as **LU-2a**, **LU-3c**, **LU-3d**, **LU-5b**, **LU-5d**, **LU-6a**, as well as policies that pertain to specific Planning Areas, would reduce the need for additional fire protection and emergency services facilities by maintaining low residential densities and limited commercial and industrial development outside of the USAs.

Based on current trends, however, it is likely that the construction of new or expanded facilities by newly formed and / or existing Fire Protection Districts would be required despite such policies. The construction of such facilities necessary to maintain adequate service ratios and response times generated by implementation of the *Draft GP 2020* would potentially result in secondary construction-related impacts. These impacts would likely include noise, dust, and erosion and sedimentation from construction and grading activities. In general, the operational impacts of these facilities are evaluated at a program level throughout this EIR since these uses are considered to be part of the land uses and development consistent with the *Draft GP 2020.*

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[77] Nichols • Berman communication with Vern Losh, Director, and Jack Rosevear, Fire Marshall, Department of Emergency Services, September 2004.

[78] Nichols • Berman communication with Vern Losh, Director, and Jack Rosevear, Fire Marshall, Department of Emergency Services, September 2004.

[79] Nichols • Berman communication with Vern Losh, Director, and Jack Rosevear, Fire Marshall, Department of Emergency Services, September 2004.

The *Draft GP 2020* includes a number of policies and programs that would help limit potential impacts related to the construction of needed fire protection and emergency service facilities. For example Policy **OSRC-8c**, would reduce potential impacts to riparian corridors by requiring future development be sited a minimum of 50 feet (or up to 200 feet in certain circumstances) from the top of banks of streams. Policies **OSRC-11b** and **WR-1h**i would reduce potential water quality impacts due to erosion at construction sites. The policies require including control measures for projects involving construction or grading near waterways or on steep slopes and that grading plans include measures to avoid soil erosion and sedimentation in storm water to the maximum extent practical. Policy **OSRC-16c** would, through project review by the local air quality district, help minimize air pollution.

While these and other policies and programs of the *Draft GP 2020* would likely reduce many of the environmental impacts associated with the construction or expansion of fire protection and emergency services facilities, analysis of potential impacts without identified sites and complete designs would be speculative. Therefore, this would be a significant impact.

Mitigation Measure 4.9-9 No mitigation available beyond the *Draft GP 2020* policies discussed in the impact analysis above.

Significance After Mitigation This would be a significant unavoidable impact. (**SU**)

Impact 4.9-10 Wildland Fire Hazards

*Implementation of the Draft GP 2020 would expose people or structures to risk of loss, injury, or death involving wildland fires. This would be a significant impact. (**S**)*

As previously mentioned, High and Very High Wildland Fire Hazard Areas cover more than half of Sonoma County. These hazard areas also lie within, adjacent, or in close proximity to nearly every unincorporated USA including Sea Ranch, Occidental, Geyserville, Russian River, Forestville, Monte Rio, Graton, and the Sonoma Valley USAs.

Additionally, in spite of land use limitations on future rural development, businesses and residences have been and would continue to be constructed and / or expanded in the unincorporated area with implementation of the *Draft GP 2020*. The DES has expressed concern that it is very difficult to maintain the ability of County firefighters to protect this development due to the following: increase in distances, hence response times, to rural properties; lack of sufficient water; heavy brush and forest-covered lands; substandard road systems; addressing problems; and in many cases, the lack of on-site fire detection and suppression. [80]

The response time to a fire is critical to the success of fire suppression - the greater the distance and time to a fire, the greater the potential for the fire to escape and become large and difficult to control. Therefore, due to previously discussed deficiencies in the ability of DES to maintain acceptable service ratios and response times that are expected to worsen given current trends, it is expected that implementation of the *Draft GP 2020* would expose people or structures to risk of loss, injury, or death involving wildland fires.

The Public Safety Element of the *Draft GP 2020* contains a number of existing and new policies and programs that if adopted and implemented would reduce such exposure to wildland fire hazards.

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[80] *Sonoma County General Plan 2020 Update Issue Summaries*, Sonoma County PRMD, October 28, 2004.

Polices **PS-3a**, **PS-3b**, **PS-3c**, **PS-3e** and **PS-3f** require the ongoing consideration of fire safety during planning activities as well as the update of the Uniform Building Code with contemporary fire safe practices. In view of the high percentage of fires caused by human activities policies **PS-3j** and **PS-3k** would reduce the wildland fire hazard by providing residents with educational materials and outdoor advertising related to fire safety. Policies **PS-3g**, **PS-3h**, and **PS-3i** encourage the cooperation with CDF to enforce fire safety standards, and identify and reduce fuel loads within High and Very High Wildland Fire Hazard Areas. Policy **PS-3i** would standardize the County's street addressing system to improve response times by fire agencies, thereby limiting the fire's potential to escape control.

The **Residential Use**, **Commercial Use**, and **Industrial Use** policies (sections 2.2 through 2.4 of the Land Use Element), policies **LU-2a**, **LU-3c**, **LU-3d**, **LU-5b**, **LU-5d**, **LU-6a**, as well as policies that pertain to specific Planning Areas, would also reduce the exposure of people or structures to risk of loss, injury, or death involving wildland fires by maintaining low rural residential densities and limited commercial and industrial development outside of the USAs.

Sonoma County Ordinances 5373 and 5402 require the installation of automatic fire sprinkler systems in all new residential and commercial buildings and conditionally require such systems at the time of the expansion of existing residential and commercial buildings. In addition, the *Draft GP 2020* Policies **PS-3d** and **PS-3m** would require on-site detection and suppression, including automatic sprinkler systems where available services do not provide acceptable levels of suppression and consider requiring such measures in all new residential and commercial structures with minor exceptions.

While these existing policies and programs, combined with new programs related to addressing and on-site detection, would do much to reduce the exposure of new land uses and development, fire danger would still present an emergency response challenge to fire service agencies. Even with sufficient funding and staff resources, an unlikely prospect, this would be a significant impact. Since onsite detection is the most effective means of reducing this impact, the following mitigation measure would be required.

Mitigation Measure 4.9-10 Revise Policy **PS-3m** as follows:

> **Policy PS-3m**: ~~Consider requiring~~ Require automatic fire sprinkler systems in all new residential and commercial structures, with exceptions for detached utility buildings, garages, and agricultural-exempt buildings. Require automatic fire sprinkler systems at the time of expansion of existing residential and commercial buildings except as provided for in the Sonoma County Code.

Significance After Mitigation While Mitigation Measure 4.9-10 as well as other policies and programs of the *Draft GP 2020* would likely reduce the exposure of people or structures to risk of loss, injury, or death involving wildland fires, funding of fire and emergency services to remote rural areas is not expected to be sufficient to reduce potential exposure to less-than significant levels. Therefore, this would remain a significant unavoidable impact. (**SU**)

Responsibility and Monitoring The Sonoma County Board of Supervisors would be responsible for adopting this revised policy as part of the *GP 2020*. PRMD would be responsible for enforcement during the design review and construction phases of individual development projects.

Criminal Justice Services – Environmental Setting

Police protection in the unincorporated portion of Sonoma County is primarily provided by the County Sheriff's Department. Since 1993 the County Sheriff's Department has also provided law enforcement services to the Town of Windsor under a contract most recently renewed in 1998 for a ten year period. [81] The County Sheriff's Department also provides coroner and correctional services county wide. [82]

The Sheriff maintains a 24-hour patrol force operating from five substations and the Main Office. As of February, 2003 there were a total of 159 peace officers, including deputies who work in patrol, administration, the helicopter unit, the boating unit, and the civil bureau with 37 deputies working in investigations for a total of 196 officers. [83] The Sheriff's Department currently maintains a service ratio of approximately 1.01 officers per 1,000 residents, less than the 2.0 officers per 1,000 residents set by the Federal Bureau of Investigation.

There are a number of other agencies that also provide law enforcement in Sonoma County. These agencies include the college and university police, city police departments, State agencies, and federal law enforcement agencies. [84]

The Sonoma County Sheriff's Department moved into the newly constructed Main Office Headquarters in April of 2002. This two-story, concrete block structure, approximately 66,000 square feet in size, houses the Sheriff's Administrative staff, Investigations Bureau, Dispatch Bureau, Crime Scene Investigation Laboratory and is where the majority of patrol staff work. [85]

The Detention Division of the Sheriff's Department provides care and custody of inmates in two facilities: The Main Adult Detention Facility (MADF) and the North County Detention Facility (NCDF). The MADF is primarily a pre-sentenced facility for those awaiting court while the NCDF is

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81 *Sonoma County Sheriff's Department; Department Functions,* Sonoma County Sheriff's Department, *http://www.sonomasheriff.org/,* December 2002.

82 *Sonoma County Sheriff's Department; Department Information,* Sonoma County Sheriff's Department, *http://www.sonomasheriff.org/,* December 2002.

83 Nichols • Berman communication with Ed Hoener, Sonoma County Sheriff's Department, Personnel Service Bureau, February 24, 2003.

84 *Sonoma County Sheriff's Department; Allied Agencies,* Sonoma County Sheriff's Department, accessed online at http://www.sonomasheriff.org/ , December 2002.

85 Excerpt from the Sonoma County Sheriff website, accessed online at www.sonomacountysheriff.org

primarily for sentenced, minimum security inmates. [86] Currently, the MADF has 755 beds and the NCDF has 412 beds. [87]

State and county crime trends are affected by demographics, economic conditions and values, lifestyles, and residential patterns, as well as by the provision of law enforcement. Numerous factors can influence crime rates, including the age of residents, the density and size of jurisdictions, the mobility of residents, economic and family conditions, strength and effectiveness of the law enforcement agencies, crime reporting practices, and most importantly, the laws and criminal justice policies of the jurisdictions. The crime rated peaked in California in 1980, declined for four years, and began to increase in 1985. Since 1992, the crime rate has been in a general decline, reaching a 34-year low in 1999. Property crime, which accounts for the bulk of crime in California, grew at a slower rate (55 percent) than violent crime (299 percent) since 1952. Since 1982, the property crime rate has decreased by 57 percent, while violent crimes decreased by 26 percent. [88] **Exhibit 4.9-19** shows the crime rates for Sonoma County following similar trends.

Exhibit 4.9-19
Sonoma County Crime Rates, 1993 – 2002 (crimes per 100,000 population)

	1993	***1994***	***1995***	***1996***	***1997***	***1998***	***1999***	***2000***	***2001***	***2002***
Violent Crimes	507	474	466	439	402	352	292	292	276	312
Property Crimes	1,465	1,503	1,284	1,058	1,165	1,019	714	776	841	977
Total	**1,972**	**1,977**	**1,750**	**1,496**	**1,567**	**1,371**	**1,005**	**1,068**	**1,117**	**1,289**

Source: *Reported Crimes and Crime Rates by Category and Crime, Sonoma County,* State Department of Justice, State Attorney General's Office, http://justice.hdcdojnet.state.ca.us/cjsc_stats/prof02/49/1.htm.

Criminal Justice Services – Regulatory Setting

COUNTY REGULATIONS

Acquisition of land for and construction of criminal justice services facilities in the unincorporated area is subject to County review for consistency with the Sonoma County General Plan under Section 65402 of the Government Code. While many public agency sponsors will strive to develop facilities

[86] *Sonoma County Sheriff's Department; Allied Agencies,* Sonoma County Sheriff's Department, accessed online at http://www.sonomasheriff.org/ , December 2002.

[87] *Sonoma County Sheriff's Department; Main Adult Detention Facility* and *North County Detention Facility,* Sonoma County Sheriff's Department, accessed online at http://www.sonomasheriff.org/ , December 2002.

[88] *Crime in California,* Criminal Justice Statistics Center, State Department of Justice, Attorney General's Office, accessed online at http://caag.state.ca.us/cjsc/publications/candd/cd02/cdintro.htm.

that are consistent with the General Plan, they have the authority to override the County's determination and proceed with acquisition and construction.

Criminal Justice Services – Significance Criteria

According to the *State CEQA Guidelines*, the project would have a significant criminal justice services impact if it would:

- Result in substantial adverse physical impacts associated with the provision of new or physically altered criminal justice facilities, the need for new or physically altered criminal justice facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times, or other performance objectives for criminal justice services.

Criminal Justice Services – Impacts and Mitigation Measures

Impact 4.9-11 Demand for Additional Criminal Justice Facilities

*Implementation of the Draft GP 2020 would increase the demand for new or expanded Sheriff's Department substations and detention facilities the construction of which could cause significant environmental impacts. This would be a significant impact. **(S)***

The Sonoma County Sheriff's Department currently maintains an acceptable service level ratio of 1.01 deputies per 1,000 county residents within its service area which includes the unincorporated area of Sonoma County and the Town of Windsor and City of Sonoma.[89] The Sheriff's Department is expected to hire two deputies per year between 2003 and 2020 for a total of 230 deputies by 2020.[90]

Although the number of deputies that would be deployed specifically within the unincorporated portion of Sonoma County in 2020 is unknown, the service level ratio of deputies per 1,000 residents within the department's service area can be determined. As demonstrated in **Exhibit 4.9-20**, population within the department's service area would be expected to increase to 192,550 residents by 2020 which would result in a ratio of 1.19 deputies per 1,000 residents.

While the Department would prefer to maintain a higher service level ratio of two deputies per 1,000 residents, implementation of the *Draft GP 2020* would not be expected to lower the service level ratio below its current level of 1.01 deputies per 1,000 residents in any area of the Sonoma County.[91]

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89 Nichols • Berman communication with Richard Sweeting, Captain, Sonoma County Sheriff's Department – Administration Division, July 2004.

90 Nichols • Berman communication with Richard Sweeting, Captain, Sonoma County Sheriff's Department – Administration Division, July 2004.

91 Nichols • Berman communication with Richard Sweeting, Captain, Sonoma County Sheriff's Department – Administration Division, July 2004.

Exhibit 4.9-20
Sonoma County Sheriff's Department - 2020 Service Level

Service Area	*Population 2020 (Persons)*
Unincorporated Area	147,660
Town of Windsor	30,300
City of Sonoma	14,590
Total	192,550
Number of Deputies in 2020	230
Ratio of Deputies per 1,000 Population for Sheriff's Department Service Area in 2020	1.19

Source: *Table LU-1: Population Trends and Projections, Sonoma County General Plan 2020 Public Hearing Draft,* Sonoma County PRMD, 2004.

With respect to the need for new facilities, The Main Office Headquarters facility was designed and built with internal expansion space to accommodate departmental growth through 2007.[92] This facility is expected to undergo in-place expansion subsequent to 2007.[93] No current planning document addresses the department's needs for additional main office facilities beyond this timeframe.

The Sheriff's Department maintains two substations in the communities of Guerneville and Sonoma Valley. Increased demand for Sheriff's Department services due to implementation of the *Draft GP 2020* would require the construction of a new Sonoma Valley substation.[94] This project, currently in the funding phase, would be expected to provide sufficient space for approximately ten to 15 years.[95] Several Capital Improvement Plans (CIPs) have recommended the in-place expansion of the Guerneville substation, but funding has not yet been allocated for improvements.[96] Development of these projects could result in significant environmental impacts related to their construction.

In recent years, the Sheriff's Department has maintained a community presence from two leased storefront locations in Roseland and Larkfield. The Roseland storefront location has closed as the City of Santa Rosa assumes increased patrol responsibilities and the Sheriff's Department experiences budget constraints. The Larkfield station is projected to remain operational for the foreseeable future.

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92 *Final Report: Buildings Utilization Plan*, County of Sonoma General Services - Architecture Division, July 1998.

93 Nichols • Berman communication with Robert Kambak, County Architect, Sonoma County General Services Architecture Division, May 2004.

94 Nichols • Berman communication with Robert Kambak, County Architect, Sonoma County General Services Architecture Division, May 2004.

95 Nichols • Berman communication with Robert Kambak, County Architect, Sonoma County General Services Architecture Division, May 2004.

96 Nichols • Berman communication with Robert Kambak, County Architect, Sonoma County General Services Architecture Division, May 2004.

The use of additional storefront locations (e.g., to serve a new large residential development) could reduce the need to construct new or expanded facilities. [97]

The demand for future detention facilities cannot be quantified at this time. Previous planning studies completed in 1998 and 2001 proved to be inaccurate by projecting a higher jail population than actually occurred. For example, although the actual average daily population for 2003 was 1045; the 1998 study projected a level of 1150 inmates while the 2001 study projected a level of 1294 inmates. The Sheriff and General Services Departments, under the oversight of the County Administrator's Office, are in the process of studying the long-term need for detention facilities and developing suitable expansion plans to accommodate projected demand . [98] While recommendations for future facilities are unknown, expansion would likely occur in one of two scenarios. [99] The first scenario would involve the expansion of the MADF as well as the expansion and replacement of NCDF in its current location. The second scenario would entail the closure of the NCDF and the consolidation of detention services at an expanded MADF.

While the *Draft GP 2020* contains no policies specific to criminal justice services, policies contained in the Land Use and Public Services and Facilities Elements would reduce some of the demand for additional law enforcement facilities. Policy **LU-4a** would reduce demand impacts to criminal justice services by allowing the application of zoning regulations to assure that development shall occur only if public services (including law enforcement) are adequate so as to maintain an acceptable level of service. Policies **LU-4d** and **LU-4f** would require assurances that development consistent with the land use plan could be accommodated by public services, that facilities would be sufficiently planned for, and that new development pay its fair share toward provision of public services.

In addition, the **Residential Use**, **Commercial Use**, and **Industrial Use** policies (sections 2.2 through 2.4 of the Land Use Element), policies **LU-2a**, **LU-3c**, **LU-3d**, **LU-5b**, **LU-5d**, **LU-6a**, as well as policies that pertain to specific Planning Areas, would reduce the demand for new criminal justice services facilities by maintaining low residential densities and limited commercial and industrial development outside of the USAs.

Although these policies could reduce some of the demand for such facilities, implementation of the *Draft GP 2020* would still require additional Sheriff's Department facilities in order to maintain acceptable service standards, the construction of which could cause significant site-specific environmental impacts. Such impacts could include dust, noise, erosion and sedimentation from construction and grading activities. In general, these impacts are addressed at a program level throughout this EIR since these facilities are considered to be part of the land uses and development consistent with the *Draft GP 2020.*

The *Draft GP 2020* includes a number of policies and programs that would help limit potential impacts related to the construction of needed Sheriff's Department facilities. For example Policy

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[97] Nichols • Berman communication with Robert Kambak, County Architect, Sonoma County General Services Architecture Division, May 2004.

[98] Nichols • Berman communication with Robert Kambak, County Architect, Sonoma County General Services Architecture Division, May 2004.

[99] Nichols • Berman communication with Robert Kambak, County Architect, Sonoma County General Services Architecture Division, May 2004.

OSRC-8c, would reduce potential impacts to riparian corridors by requiring future development be sited a minimum of 50 feet (or up to 200 feet in certain circumstances) from the top of banks of streams. Policies **OSRC-11b** and **WR-1h** would reduce potential water quality impacts due to erosion at construction sites. The policies require including control measures for projects involving construction or grading near waterways or on steep slopes and that grading plans include measures to avoid soil erosion and sedimentation in storm water to the maximum extent practical. Policy **OSRC-16c** would, through project review by the local air quality district, help minimize air pollution.

While these and other policies and programs of the *Draft GP 2020* would likely reduce many of the environmental impacts associated with the construction or expansion of Sheriff's Department facilities, analysis of potential impacts without identified sites and complete designs would be speculative and would be identified during the environmental review of each project. Therefore, this would be a significant impact.

Mitigation Measure 4.9-11 No mitigation available beyond the *Draft GP 2020* policies discussed in the impact analysis above.

Significance After Mitigation This would be a significant unavoidable impact. **(SU)**

Library Services – Environmental Setting

Sonoma County has a centralized regional library system operated as the Sonoma County Library under a Joint Powers Agreement from 1975. [100] The Joint Powers Agreement is between Sonoma County, the incorporated cities of Sonoma County, and the Sonoma County Library. The library is governed by a Library Commission appointed by the Sonoma County Board of Supervisors, and the cities of Santa Rosa and Petaluma. [101]

Branch Libraries

There are 13 branch libraries: Santa Rosa Central, Cloverdale Regional, Forestville (El Molino High School), Guerneville Regional, Healdsburg Regional, Occidental, Petaluma Regional, Rohnert Park-Cotati Regional, Santa Rosa Northwest Regional, Santa Rosa Rincon Valley Regional, Sebastopol Regional, Sonoma Valley Regional, and Windsor. Most of the branch libraries are open Monday through Saturday, except Occidental, which is only open Tuesday, Wednesday and Saturday, Forestville, which is closed Friday through Sunday, and Santa Rosa Central, which is open every day. [102]

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[100] *Sonoma County General Plan Draft Environmental Impact Report,* Sonoma County, December 1986.

[101] *Sonoma County Library; About the Library,* Sonoma County Library, accessed online at http://www.sonoma.lib.ca.us/about.htm , December 2002.

[102] *Sonoma County Library; Branch Location, Hours, and Phone Numbers* Sonoma County Library, accessed online at http://www.sonoma.lib.ca.us/branches.html , December 2002.

Special Collections

Sonoma County Library operates several special programs, including the Community Resources File, the Genealogy and Local History Library, and the Wine Library. The Community Resources File provides information on local service and non-profit organizations in Sonoma and adjacent counties. The file is updated weekly and accessible through the Library Catalog. The Genealogy and Local History Library is located in the Annex behind the Central Branch, and houses the Genealogy and Local History Resources, as well as the Photo Archive which includes over 26,000 historical photographs. The Wine Library is operated out of the Healdsburg Regional Library. The Wine Library has a collection of 5,000 books on wine and related subjects and subscriptions to over 80 wine-related periodicals. The Wine Library has also developed Winefiles.org, a project to make the Wine Library collection accessible on the internet. [103] [104]

Special Programs

The Library system also hosts a number of classes and workshops for adults, an adult literacy program, and provides a number of resources for young children and teens. It has extensive online resources including online book renewal, online catalog access, and public internet access stations in the branch libraries.

A *Strategic Plan* for the Sonoma County Library was finished in 2000. Its priorities are staff development, expanding its collections, and enhancing system services, hours, and facilities. The plan is updated annually; its success depends in part on the funding available. [105]

Library Services – Regulatory Setting

COUNTY REGULATIONS

Library services are overseen by the Sonoma County Library Commission, by a joint powers agreement among the County and cities. Acquisition of land for and construction of County library facilities in the unincorporated area is subject to County review for consistency with the Sonoma County General Plan under Section 65402 of the Government Code. While many public agency sponsors will strive to develop facilities that are consistent with the General Plan, they have the authority to override the County's determination and proceed with acquisition and construction.

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[103] This Project is supported by the U.S. Institute of Museum and Library Services under the provisions of the Library Services and Technology Act, administered in California by the State Librarian, and by several Wine Industry Groups.

[104] *Sonoma County Library; Special Collections.* Sonoma County Library, accessed online at http://www.sonoma.lib.ca.us/collections.html , December 2002.

[105] *Strategic Plan, Sonoma County Library,* Sonoma County Library Strategic Planning Committee, accessed online at http://sonomalibrary.org/stratplan0.html., December 2002

Library Services – Significance Criteria

According to the *State CEQA Guidelines*, the project would have a significant library services impact if it would:

- Result in substantial adverse physical impacts associated with the provision of new or physically altered library facilities, the need for new or physically altered library facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios or other performance objectives for library services.

Library Services – Impacts and Mitigation Measures

Impact 4.9-12 Increased Demand for Library Facilities
Implementation of the Draft GP 2020 would result in the demand for new or expanded County Library facilities in order to maintain acceptable service levels. This would be a significant impact. ***(S)***

The Sonoma County Library (County Library) has identified five goals guiding future library efforts. Three of these goals, "to provide excellent collections and services, to utilize user friendly technology, and to provide welcome environments", are directly related to library size and infrastructure. In 2003, the County Library completed a Facilities Master Plan (FMP) to evaluate its ability to meet level of service standards and agency goals.

The County Library has been unable keep pace with the growing size and changing diversity of Sonoma County's population. Since 1980, county population has increased by 53 percent while the combined size of County Library facilities has grown by only 25 percent.

According to the FMP, current facilities, designed to serve population levels of the 1980's no longer provide adequate levels of service or sufficient space in terms of seating, shelving area, and public meeting rooms. In order to meet County Library service standards, building sizes should ideally provide 0.55 – 0.68 square feet per capita. However, based on population projections contained in the *Draft GP 2020*, the year 2000 system-wide average of 0.43 square feet per capita would decline to 0.33 square feet per capita by 2025. In addition to space deficiencies, many facilities lack an adequate number of computers and do not have data and power infrastructure to support the number of devices now used to gather process and store information. Also, increasing diversity among Sonoma County residents requires a collection that addresses the needs of different age groups, learning abilities and ethnicities- especially to serve the county's growing Hispanic community. Implementation of the *Draft GP 2020* would likely increase these system-wide deficiencies.

While the County Library has made some improvements (e.g., an online system) to meet the increased demand for services, expansion of existing branches as well as construction of new facilities would be required to maintain an acceptable level of service. The FMP plans for the creation of three new service areas in the unincorporated communities of Sea Ranch – Annapolis, Bodega Bay, and

Southwest Santa Rosa where construction of new facilities would occur. In-place expansion of facilities in other unincorporated areas would occur in Occidental and Forestville. [106]

Although the *Draft GP 2020* contains no policies relevant to library services, policies contained in the FMP would reduce some impacts related to the construction of new libraries by requiring new facilities be sited within existing urban service areas, be compatible with local planning regulations, and be accessible by public transport. Also, providing library access to the coastal communities of Bodega Bay and Sea Ranch – Annapolis would reduce long vehicle trips to other library facilities by residents in these areas, thereby reducing the associated impacts to traffic and air quality.

Nevertheless, implementation of the *Draft GP 2020* would require new or expanded County Library facilities in order to maintain acceptable service ratios. The construction of these facilities could result in significant environmental impacts. Such impacts could include dust, noise, erosion and sedimentation from construction and grading activities. Libraries may also generate additional traffic at the site. In general, these impacts are addressed at a program level throughout this EIR since these facilities are considered to be part of the land uses and development consistent with the *Draft GP 2020.*

The *Draft GP 2020* includes a number of policies and programs that would help limit potential impacts related to the construction of needed County Library facilities. For example Policy **OSRC-8c**, would reduce potential impacts to riparian corridors by requiring future development be sited a minimum of 50 feet (or up to 200 feet in certain circumstances) from the top of banks of streams. Policies **OSRC-11b** and **WR-1h** would reduce potential water quality impacts due to erosion at construction sites. The policies require including control measures for projects involving construction or grading near waterways or on steep slopes and that grading plans include measures to avoid soil erosion and sedimentation in storm water to the maximum extent practical. Policy **OSRC-16c** would, through project review by the local air quality district, help minimize air pollution.

These and other policies and programs of the *Draft GP 2020* would likely reduce many of the environmental impacts associated with the construction or expansion of County Library facilities. However, analysis of potential impacts without identified sites and complete designs would be speculative and would be identified during the environmental review of the project. Therefore, this would be a significant impact.

Mitigation Measure 4.9-12 No mitigation available beyond the *Draft GP 2020* policies discussed in the impact analysis above.

Significance After Mitigation This would be a significant unavoidable impact. **(SU)**

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106 *Sonoma County Library Facilities Master Plan,* Sonoma County Library, May 7, 2003. Available online at: http://www.sonoma.lib.ca.us/doc/Sonoma_MP_Report.pdf

Human Services – Environmental Setting

Sonoma County Human Services Department

The Human Services Department includes five organizational divisions: the Administration / Fiscal Services Division, the Adult and Aging Division, the Economic Assistance Division, the Employment and Training Division, and the Family, Youth and Children Division. The department works with federal, State, and local agencies as well as private business to find solutions to human needs. The department has programs to assist aging and / or disabled adults and veterans, assist low-income or otherwise disadvantaged residents in obtaining food, shelter, medical and dental care, job training programs, and supportive social services for children under 18. [107]

Sonoma County Office of Commissions

Additionally, Sonoma County has an Office of Commissions that supports the work of the Commission on Human Rights, Commission on the Status of Women, and the Human Services Commission. [108] The Commission on Human Rights promotes better human relations among all people in Sonoma County through education and advocacy. [109] Established by the Sonoma County Board of Supervisors in 1975, the Commission on the Status of Women works to eliminate discrimination on the basis of sex in the areas of education, employment, health, housing community service and other related fields by providing information and services to women and the community on women's rights and issues. [110] The Board of Supervisors established the Sonoma County Human Services Commission in 1978 to promote the coordination of planning, funding, and delivery of countywide human services by both public and private agencies. [111]

Human Services – Regulatory Setting

COUNTY REGULATIONS

Acquisition of land for and construction of County Human Services facilities in the unincorporated area is subject to County review for consistency with the Sonoma County General Plan under Section

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[107] *Divisions & Services,* Sonoma County Department of Human Services, accessed online at http://www.sonoma-county.org/Human/division.htm , December 2002.

[108] *Office of Commissions,* Sonoma County Office of Commissions, accessed online at http://www.sonoma-county.org/ooc/index.htm , December 2002.

[109] *Commission on Human Rights,* Sonoma County Office of Commissions, accessed online at http://www.sonoma-county.org/ooc/chr.htm , December 2002.

[110] *Commission on the Status of Women,* Sonoma County Office of Commissions, accessed online at http://www.sonoma-county.org/ooc/csw.htm , December 2002.

[111] *Human Services Commission,* Sonoma County Office of Commissions, accessed online at http://www.sonoma-county.org/ooc/hsc.htm , December 2002.

65402 of the Government Code. While many public agency sponsors will strive to develop facilities that are consistent with the General Plan, they have the authority to override the County's determination and proceed with acquisition and construction.

Human Services – Significance Criteria

According to the *State CEQA Guidelines*, the project would have a significant human services impact if it would:

- Result in substantial adverse physical impacts associated with the provision of new or physically altered human services facilities, the need for new or physically altered human services facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times, or other performance objectives for human services.

Human Services – Impacts and Mitigation Measures

Impact 4.9-13 Increased Demand for Human Services Facilities

Implementation of the Draft GP 2020 could exceed the ability of the County's Human Services Department to maintain an acceptable level of service within its present level of funding and facilities and therefore could result in the expansion or construction of new Human Services facilities. This would be a significant impact. ***(S)***

The goal of the Youth and Family Services portion of the Public Facilities and Services Element of the *Draft GP 2020* is to address youth and family issues related to land use while supporting the creation of a secure and healthy environment in which all can reside. As the County Human Services Department administers youth and family service programs on behalf of State and federal agencies, the scope of these programs flex based upon agency budgets, mandates, and program regulations. Policies contained in the *Draft GP 2020* express a broad statement of County support for services to children, youth, and families. However, as budgets have and will likely continue to experience significant cuts and shortfalls, the *Draft GP 2020* does not attempt to establish County funding or budgetary obligations for Youth and Family Services. [112]

Current budgetary deficiencies and staff reductions within the County Human Services Department have hindered efforts to prepare long term planning documents that adequately assess its future needs. As a result, little information was available to analyze impacts to County Human Services that could result from implementation of the *Draft GP 2020*. Instead current conditions are analyzed and assumed to be exacerbated by both declining budgets and increased population growth for the foreseeable future.

Projected increases in county population by 2020 would result in an increased number of children that require children's protective services. Currently, 1.5 children per 1,000 residents require protective

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[112] *Public Facilities and Services Element: Children and Family Policies,* CAC memo, Richard Rogers, Sonoma County PRMD, December 19, 2002.

services as administered by the Family, Youth and Children's Services division. [113] This division currently receives approximately 3,000 calls per year requiring child abuse investigation. In general, Family, Youth and Children's Services case workers make home or in-school visits. With budget shortfalls resulting in staff reductions for the foreseeable future it would not be reasonable to expect that Family, Youth and Children's Services would require new facilities; rather, it is likely that a reduced staff would be required to shoulder increased caseloads.

The Temporary Assistance for Needy Families (TANF) program, which provides welfare for county families, is experiencing an increase in cases since 2002. [114] The program had previously seen a continuous decline from a high of 6,523 cases in 1996, to a low of 2,308 cases in 2001. Caseloads increased steadily in both 2002 and 2003 to its present level of 3,353 cases. [115]

With respect to the demand for new facilities, an attempt to build a new consolidated and expanded facility for Human Services in southwest Santa Rosa was abandoned in 2001. If the plan had been implemented, all of Human Services would have been relocated to this new county-leased building, including the workgroups that are currently at the County Center. [116] Since that time, Human Services has and will continue to experience a reduction in staff for the foreseeable future. Therefore, with the exception of the Valley of the Moon Children's Home, Human Services facility planning has not been renewed. Presently, the County General Services Department does not possess any current facilities planning documents for Human Services. [117]

Human Services oversees the county children's home. In 2002, both space limitations and additional State licensing requirements demonstrated to County officials that the existing Valley of the Moon Children's Home (VMCH) could not accommodate the needs of the county's abused, abandoned, or neglected children. The Human Services Department in conjunction with County General Services proposed the construction of a new and expanded VMCH with a capacity twice that of the existing home. The VMCH provided services for 316 children (with an average daily population of 26 children) in the 2003 fiscal year.

Phase I of the Valley of the Moon Children's Home is currently under construction. This phase consists of the construction of a 19,000 square feet housing and food service facility designed to accommodate 72 children ranging from infants to 18 years of age. The second and final phase of the VMCH project (currently unfunded) would provide an additional 27,000 square feet of administration space, medical and mental health services. The facility will also contain the Redwood Children's Center, which functions to evaluate and document cases of child abuse. A Mitigated Negative

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[113] Nichols • Berman communication with Carol Bauer, Director, Sonoma County Family, Youth and Children's Services, July 2004.

[114] *Fifth Annual Sonoma Works Report*, Sonoma County Human Services Department, October 21, 2003.

[115] *FY 2003-04 Monthly Caseload Data Summary*, Sonoma County Human Services Department, June 2004.

[116] Nichols • Berman communication with Robert Kambak, County Architect, Sonoma County General Services Architecture Division, August 2004.

[117] Nichols • Berman communication with Robert Kambak, County Architect, Sonoma County General Services Architecture Division, August 2004.

Declaration (MND), prepared in 2002, found this project would not have a substantial adverse impact on the environment provided identified mitigation measures were incorporated in the project design.

While the Youth and Family Services portion of the Public Facilities and Services Element contains numerous policies which express broad support for the welfare of the Sonoma County's families, children, and elderly residents, these policies would not likely reduce the need for improved Human Services or facilities in the face of declining funding. However, several policies would reduce the need for additional county facilities and programs by shifting some of the responsibility of care to existing community organizations like public schools. Policies **PF-3i**, **PF-3o**, and **PF-3s** encourage community and school based health services programs, the creation of child care facilities as a condition of approval for new development projects, and the provision by schools of recreation programs before and after school. In addition, the "Restorative Justice" program as described in Policy **PF-3w** would, if developed, reduce the inflow of youths into the Juvenile Hall facility by encouraging reparations to the victim and community through public service.

In addition, the **Residential Use** policy (section 2.2 of the Land Use Element), policies such as **LU-2a**, **LU-3c**, **LU-3d**, **LU-5b**, **LU-5d**, **LU-6a**, as well as policies that pertain to specific Planning Areas, would reduce the need for new human services facilities by maintaining low residential densities and limited the opportunities for development outside of the USAs.

If Human Services programs are funded and delivered in the same way as existing programs, then it is reasonable to expect that the demand for Human Services would continue to increase at a greater rate than available funding under the *Draft GP 2020*. Such demand would increase the need for the expansion of human services facilities and could result in the construction of new facilities.

The construction of these facilities could result in significant environmental impacts. Such impacts could include dust, noise, and erosion and sedimentation from construction and grading activities. Human Services facilities may also generate additional traffic at the site. In general, these impacts are addressed at a program level throughout this EIR since these facilities are considered to be part of the land uses and development consistent with the *Draft GP 2020.*

The *Draft GP 2020* includes a number of policies and programs that would help limit potential impacts related to the construction of needed County Human Services facilities. For example Policy **OSRC-8c**, would reduce potential impacts to riparian corridors by requiring future development be sited a minimum of 50 feet (or up to 200 feet in certain circumstances) from the top of banks of streams. Policies **OSRC-11b** and **WR-1h** would reduce potential water quality impacts due to erosion at construction sites. The policies require including control measures for projects involving construction or grading near waterways or on steep slopes and that grading plans include measures to avoid soil erosion and sedimentation in storm water to the maximum extent practical. Policy **OSRC-16c** would, through project review by the local air quality district, help minimize air pollution.

These and other policies and programs of the *Draft GP 2020* would likely reduce many of the environmental impacts associated with the construction or expansion of County Human Services facilities. However, analysis of potential impacts without identified sites and complete designs would be speculative and would be identified during the environmental review of the project. Therefore, this would be a significant impact.

Mitigation Measure 4.9-13 No mitigation available beyond the *Draft GP 2020* policies discussed in the impact analysis above.

Significance After Mitigation This would be a significant unavoidable impact. (**SU**)

4.10 CULTURAL RESOURCES

4.10 CULTURAL RESOURCES

Cultural Resources – Environmental Setting

Cultural resources are the remains and sites associated with human activities and include prehistoric and ethnohistoric Native American archaeological sites, historic archaeological sites, historic buildings, and elements or areas of the natural landscape which have traditional cultural significance. [1]

Note that while an EIR is a disclosure document, information about the specific location of archaeological sites and sacred lands is specifically restricted from disclosure under the *State CEQA Guidelines* section 15120(d) pursuant to Government Code section 6254. Therefore, this discussion is a general summary of the cultural resources setting prepared for this EIR.

Some topics discussed in this section overlap with other sections of this EIR, including ***Section 4.11 Visual Resources.*** Cultural resources impacts are most closely related to the *Draft GP 2020* Land Use and Open Space and Resource Conservation Elements.

PALEONTOLOGICAL RESOURCES [2]

Paleontology is the study of the forms of life existing in prehistoric or geologic times, as represented by the fossils of plants, animals, and other organisms. [3] Paleontological remains are fairly common in Sonoma County. They include plants, invertebrates, and vertebrates ranging in age from approximately 140 million years to less than 8,000 years before the present. Within the county, paleontological remains have been primarily recovered from the following geologic formations:

- *Franciscan complex (Jurassic)* – This formation largely covers the northern part of the county, with the exception of the Alexander Valley and northern Santa Rosa plain;

- *Wilson Grove Formation (Miocene-Pliocene)* – This is a common location for Paleontological remains, and is largely located in the western part of the county, along with the Ohlson Ranch Formation (Miocene-Pliocene), and the Petaluma Formation. The boundaries of this area are Occidental, Sebastopol, Petaluma, and the Coast. These formations are also present around the base of the Sonoma Mountains; and

- *Sonoma Volcanics (Miocene-Pliocene)* – This is the formation of the Sonoma Mountains and the Sonoma/ Napa Mountains which form the western border of the count.

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1 *What do Cultural Resources Mean to Property Owners?,* Anthropological Studies Center, Sonoma State University, http://www.sonoma.edu/projects/asc/defaultpage/owners.html, December 30, 2002.

2 This section summarized from *General Plan Update Draft Environmental Impact Report,* page 317, December 19, 1986.

3 *The American Heritage® Dictionary of the English Language, Fourth Edition.*

ARCHAEOLOGICAL RESOURCES [4]

Archaeology is the systematic study of past human life and culture by the recovery and examination of remaining material evidence, such as graves, buildings, tools, and pottery. [5] In Sonoma County this generally involves the study of the Native American inhabitants of the land from roughly 8,000 years ago to the early 1800's when the county was settled by American, Russian, Spanish, and Mexican colonists, and most Native Americans were brought into the mission system.

Centuries before the North Bay region became important in European struggles for empire and profit, four Native American tribes settled in village communities throughout Sonoma County: Pomo / Kashaya, Wappo, Coast Miwok, and Patwin. [6] These people inhabited the county for several thousand years. This region of the Pacific coast was occupied at the time of historic contact by peoples representing four language groups: Southern Pomo, Southwestern Pomo, Coast Miwok, and Wappo. Each group was made up of a number of autonomous village communities that held a specific tract of land, often spoke a distinct dialect, and was organized under one or more headmen.

Groups speaking two closely related Pomoan languages, Southwestern Pomo and Southern Pomo, held most of the area which was to become Sonoma County. The Southwestern Pomo occupied about thirty miles of the northwestern Sonoma County coast, extending inland up to 13 miles. This territory consisted primarily of rocky coastline and unbroken redwood forest. Shellfish, sea mammals, and salmon were major resources. Village sites were situated along the coast and on inland ridges.

The Southern Pomo held the Russian River drainage south of the Mendocino-Sonoma County line, except for the mouth of the river. This territory consisted of valleys and foothills with plentiful resources and a temperate climate. The Laguna de Santa Rosa's marshlands and seasonal lake provided year round resources. Permanent occupation sites were most frequently at the confluence of streams, in the valleys, and at the bases of hills.

The Coast Miwok territory included all of present-day Marin County and extended north to that of the Southern Pomo. It included the Petaluma River basin and, during the post-mission period, the Cotati area. It is also believed that they inhabited the Sonoma Valley. The Coast Miwok depended heavily on the gathering of shellfish, primarily mussels and clams. Living sites were generally along the shoreline or near bays and lagoons.

The Wappo held the area in Napa County north of the Coast Miwok. Their territory extended to Middletown in Lake County, east to the divide separating the Napa Valley from the Berryessa Valley, west to include portions of the Geyser's area, and south to the headwaters of Sonoma Creek and the Upper Napa River. The Alexander Valley between Healdsburg and Geyserville was taken from the Southern Pomo by the Wappo around 1830.

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4 This section summarized from *General Plan Update Draft Environmental Impact Report,* pages 317-319, December 19, 1986.

5 *The American Heritage® Dictionary of the English Language, Fourth Edition.*

6 *Four Tribes of Sonoma County,* Sonoma County Historical Society, http://www.sonomacountyhistory.org/, December 2002.

It is estimated that the Wappo and Pomo groups may be associated with the ancient millingstone cultures that appeared in California about 8,000 years ago. The Pomo may have emerged from this culture around 5,000 years ago, when some groups began to descend from Clear Lake into the Upper Russian River drainage. It is estimated that the Wappo emerged between 2,000 and 1,000 B.C. The Coast Miwok may have appeared around 500 B.C.

HISTORICAL RESOURCES [7]

Historical resources, as distinguished from archaeological resources, include antiques, buildings, structures, and sites generally of the past two centuries, marking the successive eras of Russian, Mexican, and North American occupation of Sonoma County. [8]

Although Spain and England originally claimed the land that is now California, Spain lost the title to Mexico in 1821, before the settlement of Sonoma County began. Russia, although a colonist for about 29 years, was never able to get recognized by foreign powers. The actual staking and settling were largely the efforts of Mexican citizens and of persistent Yankee traders, trappers, adventurers, and seamen who kept slipping in during the last quarter of the eighteenth century.

Over the next century there were numerous attempts by Spanish, Mexican, and Russian governments to colonize various parts of Sonoma County. By the Mid-1840's Americans were present in substantial numbers and in June of 1846 thirty three Americans raised the Bear Flag in Sonoma and declared independence. The war between Mexico and the United States, which had begun a month before the action in Sonoma, ended in 1848 and resulted in the addition of California to the territories of the United States. Statehood came in 1850, and in 1851 California was divided into counties.

Exhibit 4.10-1 shows the Sonoma County Historic Landmarks, State Points of Historical Interest, and National Historic Landmarks, as well as resources listed on the California Register of Historical Resources or the National Register of Historic Places, listed alphabetically by the name of the nearest town or city.

Exhibit 4.10-1
Sonoma County Historic Sites

Name / Description	*Location*	*SCHL*	*CRHR*	*SPHI*	*NRHP*	*NHL*
General Joseph Hooker's Ranch	Agua Caliente	x				
Clarks Crossing/#20C-141	Annapolis	x [b]				
Haupt Creek Bridge #20C-224	Annapolis	x [b]				
Old Horicon School House	Annapolis	x				
Asti Chapel / Italian Swiss Colony	Asti	x	x			
Bloomfield Cemetery	Bloomfield	x				
Bloomfield School	Bloomfield	x				

[7] This section summarized from *General Plan Update Draft Environmental Impact Report*, pages 320-321, December 19, 1986.

[8] *General Plan Update Draft Environmental Impact Report*, pages 320-321, December 19, 1986.

Name / Description	Location	SCHL	CRHR	SPHI	NRHP	NHL
I.O.O.F. Lodge Hall	Bloomfield	x				
Masonic Lodge	Bloomfield	x				
Bodega Historic District	Bodega	x				
Potter School	Bodega	x				
St. Teresa's Church	Bodega		x			
Watson School & Wayside Park	Bodega	x		x	x	
Witham House	Bodega	x				
Bodega Bay	Bodega Bay		x		x	
Kee Ranch House	Bodega Bay	x [b]				
Ranch Site, The	Bodega Bay	x			x	
Agua Caliente Springs Hotel	Boyes Hot Springs	x				
Sonoma Mission Inn & Water Tower	Boyes Hot Springs	x				
Calvin H Holmes House	Calistoga	x [a]				
Franz Valley District School	Calistoga	x [a]				
Jackson Place	Calistoga	x [a]				
Laufenburg Barn & Residence	Calistoga	x [a]				
Meeker Residence	Camp Meeker	x				
Gleason (Mann) Ranch	Carmet	x				
Saw Mill Teepee	Cazadero	x				
Big Sulphur Cr Bridge #20C-05	Cloverdale	x [b]				
Cloverdale Railroad Station	Cloverdale				x	
Gould--Shaw House	Cloverdale				x [b]	
Icaria-Speranza Commune	Cloverdale		x [b]			
Pinschower, Simon, House	Cloverdale				x	
Preston Ranch	Cloverdale	x				
Shaw, Isaac E., Building	Cloverdale				x [b]	
Cotati Downtown Plaza	Cotati		x			
Duncans Mills Depot	Duncans Mills	x				
Duncans Mills Historic District	Duncans mills	x				
Duncans Mills School	Duncans Mills	x				
Superintendent's House	Duncans mills	x				
Kenny Residence	El Verano	x				
Nicholas Carriger Estate	El Verano	x				
Nicholas Carriger Grand View	El Verano	x				
Sonoma State Home-Main Building	Eldridge				x [b]	
Clementi's Inn	Fetter's Hot Springs	x				
Fetter's Hot Springs Depot	Fetter's Hot Springs	x				
Cooper's Sawmill	Forestville		x			
Walker/Case House	Forestville	x [b]				
Wohler Bridge #20C-155	Forestville	x [b]				
Call Ranch	Fort Ross	x				
Fort Ross	Fort Ross	x	x		x	x
Fort Ross Chapel	Fort Ross				x	
Fort Ross Commander's House	Fort Ross				x	x

Name / Description	Location	SCHL	CRHR	SPHI	NRHP	NHL
Freestone Country Store	Freestone	x				
Freestone Historic District	Freestone	x				
Freestone House	Freestone	x			x	
Freestone School House	Freestone	x				
Hinds Hotel	Freestone				x	
Alexander Valley Community Hall	Geyserville	x [b]				
Bosworth Residence	Geyserville	x				
Geyserville School (demolished)	Geyserville	x			x	
Heart's Desire Nursery	Geyserville	x				
Old Geyserville Hotel	Geyserville	x				
Arnold Dr Bridge #20C-213	Glen Ellen	x [b]				
Beltane Ranch	Glen Ellen	x				
Calabezas Bridge	Glen Ellen	x				
Chavet Building	Glen Ellen	x				
Dunbar School	Glen Ellen	x				
Gaige House	Glen Ellen	x				
Glen Oaks	Glen Ellen	x			x [b]	
Hotel Chauvet	Glen Ellen	x			x [b]	
Jack London Ranch & State Historic Park	Glen Ellen	x [b]	x		x	x
Joshua Chauvet House	Glen Ellen	x				
Mervyn Hotel Site	Glen Ellen	x				
Shone's Country Market	Glen Ellen	x				
Stone Winery Building	Glen Ellen	x				
Superintendent's House/Sonoma State	Glen Ellen	x				
Ten Oaks Ranch	Glen Ellen	x				
Thompson Ranch and Cemetery	Glen Ellen	x				
Triniti School	Glen Ellen	x				
Valley of the Moon Winery	Glen Ellen	x [b]				
Wake Robin Lodge	Glen Ellen	x				
Wegnerville Resort	Glen Ellen	x				
Green Valley School	Graton	x [b]				
Hicks House	Graton	x			x [b]	
North Fork Bridge #10C-46	Gualala	x [b]				
Belden House	Guerneville	x				
Guerneville Bridge #20C-91	Guerneville	x [b]			x [b]	
Hacienda Bridge #20C-37	Guerneville	x [b]				
Alexander School	Healdsburg	x				
Alexander Valley Community Church	Healdsburg	x				
Chalk Hill/Maacamas Br #20C-242	Healdsburg	x [b]				
Cyrus Alexander Adobe & Cemetery	Healdsburg	x				
Daniles School	Healdsburg	x [b]				
Dry Creek Store	Healdsburg	x				
Dry Creek-Warm Springs Valleys Archeological District	Healdsburg				x	

Name / Description	Location	SCHL	CRHR	SPHI	NRHP	NHL
Healdsburg Carnegie Library	Healdsburg				x [b]	
Jimtown Store	Healdsburg	x [b]				
Lambert Bridge #20C-248	Healdsburg	x [b]				
Madrona Knolls Rancho	Healdsburg	x			x [b]	
Rose Villa (Powell's Place)	Healdsburg	x				
Sweetwater Springs Historic District w/ Walter's Hop Kiln & Sheep Barn & Griffin Residence	Healdsburg	x	x		x	
Wohler Ranch	Healdsburg	x				
Washoe House	Hessel	x				
Duncan's Landing Site	Jenner				x	
Chateau St. Jean	Kenwood	x				
Kenwood Community Church	Kenwood	x				
Kenwood Depot	Kenwood	x				
Kenwood Winery	Kenwood	x				
Monroe Ranch/Coops House	Kenwood	x [b]				
Partis Residence	Kenwood	x				
Wildwood Vineyards	Kenwood	x				
Highland Dell Resort	Monte Rio	x [b]				
Church of Occidental	Occidental	x				
Coleman Valley Ranch	Occidental	x				
Occidental Historic District	Occidental	x				
St. Phillips Church	Occidental	x				
Taylor Building	Occidental	x				
Union Hotel	Occidental	x				
Denman Creamery	Penngrove	x				
Penngrove Historic District	Penngrove	x				
Wharff House	Penngrove	x [b]				
Dunham School	Petaluma	x				
Free Public Library of Petaluma	Petaluma				x [b]	
Freeman Parker Ranch	Petaluma	x				
Haystack Ranch	Petaluma	x				
Holy Ghost Hall	Petaluma	x [b]				
Kastania Ranch	Petaluma	x				
Liberty Cemetery	Petaluma	x				
Niemela Ranch	Petaluma	x [b]				
Octagon House	Petaluma	x				
Old Petaluma Opera House	Petaluma				x	
Petaluma Adobe	Petaluma		x		x	
Petaluma Historic Commercial District	Petaluma				x [b]	
Petaluma Silk Mill	Petaluma				x	
Skillman House	Petaluma	x [b]				
Stump Ranch	Petaluma	x				
Sweed, Philip, House	Petaluma				x [b]	

Name / Description	*Location*	*SCHL*	*CRHR*	*SPHI*	*NRHP*	*NHL*
Sweeney Ranch	Petaluma	x				
US Post Office--Petaluma	Petaluma				x	
Watson Ranch (Pepper Farm)	Petaluma	x				
Carrington Ranch	Salmon Creek	x				
Stage Stop	Salmon Creek	x				
Benjamin Ranch	Santa Rosa	x				
Bennett Valley Cemetery	Santa Rosa	x				
Bennett Valley Grange Hall	Santa Rosa	x				
Cnopius House	Santa Rosa				x	
Finley Hop Ranch	Santa Rosa	x				
Gables, The	Santa Rosa	x			x	
Hood, William, House	Santa Rosa		x		x [b]	
Hotel La Rose	Santa Rosa				x	
James Kruse House	Santa Rosa	x				
Jim Voss Cottonwood Grove	Santa Rosa	x				
John Medica Gardens	Santa Rosa		x			
John Rosseter Stables	Santa Rosa	x				
Laughlin House	Santa Rosa	x				
Lumsden, W. H., House	Santa Rosa				x	
Luther Burbank Home and Garden	Santa Rosa		x		x	x
Maddux Home	Santa Rosa	x				
Mark West Lodge	Santa Rosa	x				
Martinelli	Santa Rosa	x [b]				
Massey House	Santa Rosa	x				
McDonald Mansion	Santa Rosa				x	
Old Post Office	Santa Rosa				x	
Park Apartments	Santa Rosa				x	
Petrified Forest	Santa Rosa		x			
Railroad Square District	Santa Rosa				x	
Rosenburg's Department Store	Santa Rosa				x [b]	
Sweet House	Santa Rosa				x [b]	
Wasserman House	Santa Rosa				x	
Del Mar Ranch	Sea Ranch	x [b]				
Sea Ranch Condominium #1	Sea Ranch	x				
Sea Ranch Stable & Barn	Sea Ranch	x			x [b]	
Eucalyptus School	Sebastopol	x				
Gold Ridge Farm	Sebastopol				x	
John Taber Home	Sebastopol	x				
Llano Road House	Sebastopol	x			x	
Pitkin Ranch	Sebastopol	x				
Sanders House	Sebastopol	x [b]				
Sebastopol Depot of the Petaluma and Santa Rosa Railway	Sebastopol				x [b]	
Strout, George A., House	Sebastopol				x	

Name / Description	*Location*	*SCHL*	*CRHR*	*SPHI*	*NRHP*	*NHL*
Petaluma and Santa Rosa Railway Powerhouse	Sebastopol				x [b]	
Bear Flag Monument	Sonoma		x			
Blue Wing Inn	Sonoma		x			
Buena Vista Winery	Sonoma	x	x		x	
C.F. Leiding House	Sonoma	x				
Carriger, Nicholas, Estate	Sonoma				x [b]	
Cavedale Road Marker	Sonoma		x			
Circle Bar Ranch Barn	Sonoma		x			
Cooper House	Sonoma		x			
Cutter House	Sonoma	x				
Harazthy Ranch	Sonoma	x				
Kiser Residence	Sonoma	x				
Laidlaw House	Sonoma	x				
Leveroni Ranch	Sonoma	x [b]				
Magnolia Farm	Sonoma	x				
Mission San Francisco Solano	Sonoma	x				
Nash Adobe	Sonoma	x				
Rosser Ranch	Sonoma	x				
Salt Ranch & Residence	Sonoma	x				
Schellville Baptist Church	Sonoma	x				
Sobre Vista Farm Bath/Pool House	Sonoma	x				
Sobre Vista Farm Guest House	Sonoma	x				
Sobre Vista Farm Main House	Sonoma	x				
Sobre Vista Farm Tennis Court	Sonoma	x				
Sobre Vista Overview Farm	Sonoma	x				
Sonoma Depot	Sonoma				x	
Sonoma Grammar School	Sonoma				x	
Sonoma Plaza	Sonoma		x		x [b]	x
Sonoma Plaza (Boundary Increase)	Sonoma				x [b]	
Swiss Hotel / Salvador Vallejo Adobe	Sonoma	x	x			
Temelec Hall	Sonoma	x [b]	x			
Union Hotel and Union Hall	Sonoma		x			
Vallejo Estate	Sonoma		x		x	
Vella House	Sonoma	x				
Vineyard and winery (San Francisco Solano Mission Vineyard)	Sonoma		x			
Watmaugh Road Bridge	Sonoma	x				
Fort Ross School	Stewarts Point	x				
Salt Point State Park Archeological District	Stewarts Point				x	
Stewarts Point Hotel	Stewarts Point	x				
Stewarts Point School	Stewarts Point	x				
Stewarts Point Store	Stewarts Point	x				
Bufano Statue	Timber Cove	x				
Presbyterian Church Cemetery	Two Rock	x				

Name / Description	*Location*	*SCHL*	*CRHR*	*SPHI*	*NRHP*	*NHL*
Two Rock Grange Hall	Two Rock	x				
Christo Running Fence	Valley Ford	x				
Greek Revival Cottage	Valley Ford	x				
Italianate Cottage	Valley Ford	x				
James Fowler House	Valley Ford	x				
Kirkland House	Valley Ford	x				
Valley Ford Hotel	Valley Ford	x				
Laughlin, James H. and Frances E., House	Windsor				x	
Total	***230 listings***	***174***	***26***	***1***	***59***	***5***
New listings since 1986	*52 new listings*	*30*	*1*	*0*	*21*	

SCHL – Sonoma County Historic Landmarks
CRHR – California Register of Historical Resources
SPHI – State Point of Historical Interest
NRHP – National Register of Historic Places
NHL – National Historic Landmark

[a] These sites are in Sonoma County, to the west of Calistoga.

[b] These sites were listed after 1986.

Sources: *California State Historical Landmarks in Sonoma County*, available on California Environmental Resources Evaluation System (CERES) website, http://ceres.ca.gov/geo_area/counties/Sonoma/landmarks.html, January 14, 2003; *Historic Properties Directory for Sonoma County*, available from the California Office of Historic Properties, January, 2003; *Index by State and County*, available on National Register Information System website database, http://www.cr.nps.gov/nr/research/nris.htm, January 14, 2003; *Landmarks Sorted by Street Name then Number*, Sonoma County Landmarks Commission Database, October 17, 2002

Cultural Resources – Regulatory Setting

COUNTY REGULATIONS

Zoning

Historic Resources are currently regulated by the County through the use of the Historic Combining District (HD). The HD zoning requires that any exterior alteration, repair, or addition to a structure on a site zoned HD, which requires a building permit, is subject to review and approval by the Landmarks Commission. A new building constructed within the boundaries of a historic district also requires approval of the Commission. A demolition permit is also subject to the Commission's review.[9] County procedures for environmental review of public projects include referral to the Northwest Information Center (NWIC) in order to determine whether or not the project site might contain archeological resources. Field surveys and mitigation measures may be required if resources are located on or near the project site.

9 *Sonoma County Historic Preservation Program*, Sonoma County Landmarks Commission, October 1999 revision.

Landmarks Commission

The Landmarks Commission was established by the Board of Supervisors in 1976 for the purpose of protecting historic resources and implementing a grants program for historic preservation projects. Specifically the Commission functions as Design Review for historic resource sites and reviews all building permits on HD zoned properties for demolition, new construction, or remodeling. The Commission is required by ordinance to approve a zoning permit for the project prior to issuance of the building or demolition permit. [10]

In addition the Commission maintains a list of historic sites in Sonoma County. [11] There are currently 189 designated County Landmarks and about 1,000 sites listed on the County inventory of historic sites. [12]

The Landmarks Commission has a limited amount of funds (usually $50,000/year) available for the restoration of landmarks. Matching funds are required, and priority is given to public buildings and those with some program of public access. Structures must be either on the National Register, a State Landmark, or a Sonoma County Landmark. Grants may also be used to fund historic building surveys for specific areas of the county. [13]

STATE REGULATIONS

California Register of Historical Resources

The California Register of Historical Resources, created by State legislation in 1993, [14] is an authoritative guide to California's significant historical and archeological resources to be used in identifying the existing historical resources of the state. The California Register program identifies historical resources for state and local planning purposes and defines threshold eligibility for State historic preservation grand funding. The State Historical Resources Commission (SHRC) oversees the California Register program, which the State Office of Historic Preservation (OHP) administers. The California Register includes sites listed or eligible for listing in the National Register of Historic

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10 *Landmarks Commission Zoning Permit – Application/Information*, Sonoma County Permit and Resource Management Department, December 2002.

11 *Sonoma County Board of Supervisors, Landmarks Commission*, accessed online at http://www.sonoma-county.org/board/maddy/results.asp?ID=44, December 30, 2002.

12 Nichols • Berman communication with Kathi Jacobs, Planner III, PRMD, October, 2003.

13 *Sonoma County Historic Preservation Program*, page 2, Sonoma County Landmarks Commission, October 1999 revision.

14 *Technical Assistance Series #10, California State Law and Historic Preservation: Statues, Regulations and Administrative Policies Regarding Historic Preservation and Protection of Cultural and Historical Resource*, page 67, California Office of Historic Preservation, Department of Parks and Recreation, May 23, 2001.

Places, State Historical Landmarks (numbered 770 or higher), and California Points of Historical Interest. [15]

Listing of a property on the California Register does not prevent the use, sale, or transfer of the property, nor does it prevent the alteration or demolition of a historic resource. Because land use authority in California resides with the local government, listing does not give either the State or the federal government any additional authority over the property. Listing on the California Register may, however, qualify the owner to benefit from historic preservation grants and other preservation programs such as the Mills Act. Listing also allows the State Historical Building Code to be applied when requirements of the Uniform Building Code threaten the historical integrity of a designated resource, and listed sites are considered significant resources for the purposes of CEQA. [16]

The California Register includes resources listed in or formally determined eligible for listing in the National Register of Historic Places, as well as some California State Landmarks and Points of Historical Interest. Properties of local significance that have been designated under a local preservation ordinance (local landmarks or landmark districts) or that have been identified in a local historical resources inventory may be eligible for listing in the California Register and are presumed to be significant resources for purposes of CEQA unless a preponderance of evidence indicates otherwise (PRC § 5024.1, 14 CCR § 4850). [17]

Mills Act

The Mills Act is a local property tax incentive for historic preservation. [18] To obtain the benefits of the Mills Act, a formal agreement, generally known as a Mills Act contract, is executed between the local government and the owner of a qualifying property for a minimum ten-year term. Contracts are automatically renewed each year and are transferred to new owners when the property is sold. Property owners agree to protect, preserve, and maintain the property in accordance with specific historic preservation standards and conditions identified in the contract. In exchange, the County Assessor is required to calculate the assessed value of the property tax savings for Mills Act properties on the capitalization of income method rather than on market value. [19]

The Mills Act is a permissive program subject to approval and adoption by city and county governments and provides local governments the flexibility to design preservation programs to

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15 *Technical Assistance Series #3 California Register of Historical Resources: Questions and Answers,* California Office of Historic Preservation, Department of Parks and Recreation, September 9, 2002.

16 *Technical Assistance Series #3 California Register of Historical Resources: Questions and Answers,* California Office of Historic Preservation, Department of Parks and Recreation, September 9, 2002.

17 *Technical Assistance Series #1, CEQA and Historical Resource,* California Office of Historic Preservation, Department of Parks and Recreation, May 23, 2001.

18 *Technical Assistance Series #3 California Register of Historical Resources: Questions and Answers,* California Office of Historic Preservation, Department of Parks and Recreation, September 9, 2002.

19 *Technical Assistance Series #12, Mills Act Property Tax Abatement Program,* Pages 1-2, California Office of Historic Preservation, Department of Parks and Recreation, May 23, 2001.

accommodate specific community needs and priorities. [20] Neither Sonoma County nor any city government within the county has adopted an ordinance to implement the Mills Act although Sonoma County is preparing an ordinance for consideration. [21]

State Historic Building Code

The State Historical Building Code (SHBC) is a special building code adopted in 1979 by the State of California. [22] The SHBC was developed to accommodate changes necessary for the continued use of historic buildings, while preserving their historic character and significant architectural features. Applicants may elect to use the SHBC as an alternative to standard construction codes such as the Uniform Building Code or the Uniform Mechanical Code. Sections of the SHBC include: occupancy and use, structural (including seismic), mechanical, plumbing, electrical, exiting, fire protection, use of historic building materials and building systems (e.g., elevators), accessibility, and other construction-related topics. [23]

In order to qualify for the SHBC, a property must be a federal, State, or local landmark, or be listed on an official inventory of historic properties. For qualified historical properties governed by the SHBC, the degree or amount of rehabilitation work, the preceding length of vacancy, or even a change of occupancy may not be used as justification for an automatic requirement for other types of additional upgrading, or for full regular code compliance. [24]

FEDERAL REGULATIONS

National Historic Landmarks

National Historic Landmarks are buildings, sites, districts, structures, and objects that have been determined by the Secretary of the Interior to be nationally significant in American history and culture. There are fewer than 2,500 National Historic Landmarks in the United States, with five in Sonoma County: Sonoma Plaza, Luther Burbank Home and Garden, Jack London Ranch & State Historic Park, Fort Ross, and the Fort Ross Commander's House. [25] The National Historic Landmarks Program is operated through a partnership of the National Park Service and the National Historic Landmark

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[20] *Technical Assistance Series #12, Mills Act Property Tax Abatement Program,* Pages 1-2, California Office of Historic Preservation, Department of Parks and Recreation, May 23, 2001.

[21] Nichols • Berman communication with Kathi Jacobs, Planner III, Sonoma PRMD, February, 2003.

[22] *California's State Historical Building Safety Code,* California's State Historical Building Safety Board.

[23] *The State Historical Building Code,* City of Pasadena Planning Division website, December 30, 2002, http://www.ci.pasadena.ca.us/planning/deptorg/dhp/shbc.asp.

[24] *California's State Historical Building Safety Code: Code Upgrading "Triggers" and the SHBC,* California's State Historical Building Safety Board website, December 30, 2002, http://www.dsa.dgs.ca.gov/StateHistoricalBuildingSafetyBoard/shbsb_triggers.htm.

[25] Nichols • Berman research on the National Historic Landmarks Program online database, January 8, 2003, http://tps.cr.nps.gov/nhl.

Stewards Association.[26] All National Historic Landmarks are listed on the National Register of historic places which is the official list of the Nation's historic properties worthy of preservation.[27] Benefits available for properties listed as National Historic Landmarks include limited federal grants through the Historic Preservation Fund and federal income tax incentives available for donating easements and for rehabilitating income-generating historic buildings.[28]

National Register of Historic Places

Administered by the National Park Service, the National Register of Historic Places is the Nation's official list of cultural resources worthy of preservation. Authorized under the National Historic Preservation Act of 1966, the National Register is part of a national program to coordinate and support public and private efforts to identify, evaluate, and protect our historic and archeological resources. Properties listed on the Register include districts, sites, buildings, structures, and objects that are significant in American history, architecture, archeology, engineering, and culture. There are a total of 25 properties within the unincorporated area of Sonoma County which are listed on the National Register.

Listing on the National Register contributes to preserving historic properties by giving the property owner eligibility for federal tax benefits and qualifying them for federal assistance for historic preservation when funds are available.[29] Properties listed only on the National Register, and not designated as National Historic Landmarks, are primarily of state and local significance, while Historic Landmarks are sites of national significance.[30]

Federal Historic Preservation Tax Incentives Program

This program offers tax credits to owners who rehabilitate historic buildings in accordance with their historic character. The Tax Reform Act of 1976 created the first federal tax incentives for the preservation of historic buildings. It made historic preservation more competitive with new construction. The incentives contained in the law were modest – building owners were allowed to claim accelerated depreciation on rehabilitated buildings – but they made a difference immediately.

Subsequent changes in the law in 1978, 1981, and 1986 made the modest benefits of the 1976 law much more attractive to property owners. Under the current law, an owner who rehabilitates a historic

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26 *National Historic Landmarks Program,* homepage, January 8, 2003, http://www.cr.nps.gov/nhl/.

27 *Frequently Asked Questions,* National Historic Landmarks Program website, January 8, 2003, http://www.cr.nps.gov/nhl/QA.htm.

28 *Frequently Asked Questions,* National Historic Landmarks Program website, January 8, 2003, http://www.cr.nps.gov/nhl/QA.htm.

29 *Welcome to the National Register*, National Register of Historic Places website, January 8, 2003, http://www.cr.nps.gov/nr/about.htm.

30 *Frequently Asked Questions,* National Historic Landmarks Program website, January 8, 2003, http://www.cr.nps.gov/nhl/QA.htm.

building may qualify for a tax credit equal to 20 percent of the rehabilitation costs. Federal income tax credits lower the amount of federal income taxes owed by individual and corporate taxpayers. [31]

National Historic Preservation Act

Federal funding or licensing of activities that affect historic properties are regulated principally by Sections 106 and 110(f) of the National Historic Preservation Act. Under Sections 106 and 110(f) of the Act, federal agencies must "take into account" the effects of their undertakings on historic properties and afford the Advisory Council on Historic Preservation (Council) an opportunity to comment on the undertaking and its effects. Implementing regulations of the Council may be found in 36 CFR Part 800, *Protection of Historic Properties*, which establish a process of consultation with the State Historic Preservation Officer and the Council leading, in most instances, to agreement on how the undertaking will proceed. Steps in the process include identification and evaluation of historic properties that may be affected, assessment of the effects of the federal action, and resolution of any adverse effects that would occur. If a federal activity will "directly and adversely affect" a National Historic Landmark, Section 110(f) of the Act also calls for federal agencies to undertake "such planning and actions as may be necessary to minimize harm to such Landmark". As with Section 106, the agency must provide the Council with a reasonable opportunity to comment in accordance with 36 CFR Part 800. [32]

Economic Recovery Act of 1981

The Economic Recovery Act of 1981 contains substantial tax incentives for the rehabilitation of historic buildings, including a 25 percent tax credit and full depreciation for commercial and multi-family residential properties. To qualify, a structure must be listed in the National Register or located in a Historic District. [33]

Cultural Resources - Significance Criteria

According to the *State CEQA Guidelines*, the project would have a significant cultural resources impact if it would: [34]

- Cause a substantial adverse change in the significance of a historical resource;
- Cause a substantial adverse change in the significance of an archaeological resource;

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[31] *Federal Tax Incentives for Rehabilitating Historic Buildings*, U.S. Department of the Interior, National Park Service, National Center for Cultural Resources.

[32] *Frequently Asked Questions*, National Historic Landmarks Program website, January 8, 2003, http://www.cr.nps.gov/nhl/QA.htm.

[33] *Sonoma County Historic Preservation Program*, page 2, Sonoma County Landmarks Commission, October 1999 revision.

[34] This is an abbreviated discussion of significance criteria contained in section 15064.5 of the *CEQA Guidelines*.

- Disturb any human remains, including those interred outside of formal cemeteries; or
- Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature.

Cultural Resources – Impacts and Mitigation Measures

Impact 4.10-1 Historic Resources

*Land uses and development consistent with the Draft GP 2020 could result in the disturbance of historic resources. This would be a significant impact. **(S)***

As shown in **Exhibit 4.10-1**, Sonoma County has historic sites that are designated on local, State, and national historical lists as well as undesignated potential historic resources. As land uses and development and redevelopment continue, the potential demolition, destruction, alteration, or relocation of historic resources may occur that could result in the disturbance of historic resources.

The *Draft GP 2020* includes several policies in the Open Space and Resource Conservation Element which if adopted and implemented would reduce adverse changes to historic resources resulting from implementation of the *Draft GP 2020.* Policies **ORSC-19a** through **ORSC-19e** would reduce impacts to historic resources by designating the Landmarks Commission, the foundation of the Sonoma County Historic Preservation Program, as the advisory body on decisions governing projects within the Historic Combining District (HD) zoning designation. These policies direct the Landmarks Commission to review projects, encourage the designation of landmarks, recommend structures based on identification and review of Historic Building Surveys as potential county landmarks, continually update historic resource inventories, and mitigate the removal, destruction, or alteration of an identified historic resource.

The *Draft GP 2020* also contains policies vital to the long-term success of the Historic Preservation Program. Implementation of Policy **ORSC-19h** would result in the continued pursuit of grant funding for the preparation and updating of the historic resources inventory. Policy **ORSC-19i** would reduce impacts to historic resources through a Landmarks Commission administered preservation program designed to stabilize, rehabilitate, and restore designated historic structures.

The *Draft GP 2020* proposes no changes to historical preservation policies contained in the existing *General Plan* or to the role of the Landmarks Commission. Specifically, the Landmarks Commission currently has review and approval authority over all exterior alteration, repair, and addition to or demolition of a structure, on a site zoned HD. Additionally, any new building constructed within the boundaries of a historic district requires approval of the commission and must comply with adopted architectural design standards.[35] These standards would continue to promote architectural and aesthetic consistency of new development with existing historic structures and ensure preservation of buildings already protected as historic resources.

With respect to undesignated historic resources, because the County ordinance only deals with sites that are zoned HD (about 400 sites), a building or other ministerial permit affecting such a resource

[35] *Standards and Criteria for Architectural Review*, Sonoma County Landmarks Commission, 1979.

would not be subject to review by the Landmarks Commission. However, the County does maintain an inventory of approximately 1,000 sites that have had some level of survey work performed and qualify as historic resources even though they are not zoned HD. The inventory list is consulted during the environmental review process for discretionary projects subject to CEQA. If the inventory list or other source of information provides any indication that a historic resource would be located on the project site, the applicant may be required to perform a survey and, if necessary, to protect the historic resource. While some protection would be afforded to undesignated historic resources, impacts to undesignated historic resources may be significant. Therefore, the following mitigation would be required.

Mitigation Measure 4.10-1 Add a new policy in the Open Space and Resources Conservation Element as follows:

> **Policy OSRC-19j** Develop a Historic Resources Protection Program that provides for an ongoing process of updating the inventory of historic resources. Such a program should include:
>
> (1) Periodic historic building surveys;
>
> (2) Formalized recognition of the inventory of historic resources as recommended by the State Office of Historic Preservation, including, rezoning to the Historic Combining District (HD); and
>
> (3) Procedures for the protection of recognized historic resources for both ministerial and discretionary permits.

Significance After Mitigation Implementation of Mitigation Measure 4.10-1 would reduce the impact to undesignated historic resources to a less-than-significant level. **(LTS)**

Responsibility and Monitoring The Board of Supervisors would be responsible for adopting the above policy as part of the *GP 2020*. The PRMD would be responsible for monitoring the implementation of this program.

Impact 4.10-2 Archeological and Paleontological Resources and Human Remains

Land uses and development consistent with the Draft GP 2020 could result in the disturbance of subsurface archeological and paleontological resources as well as human remains, including those interred outside of formal cemeteries. This would be a significant impact. ***(S)***

As previously described, Sonoma County has a rich archeological and paleontological history with numerous recorded sites throughout the nine planning areas. These resources, which include deposits and remains left by local Native Americans and other early inhabitants, represent an important part of the history of Sonoma County and the Native American community. Without proper regulations and monitoring, excavation and grading activities resulting from land use activities consistent with the *Draft GP 2020* could result in the significant disturbance of an archaeological resource (e.g., the loss of integrity or information), the disturbance of human remains, or the destruction of a unique paleontological resource. Such alteration of cultural resources may prevent potentially eligible sites from being listed on the California Register of Historical Resources.

Policy **ORSC-19f** would continue to reduce these impacts to cultural resources from some proposed development by referring project applications to the Northwest Information Center (NWIC) for

discretionary permits in order to determine if the site might contain archeological resources. If, based on the initial consultation, a site is likely to contain these resources; the NWIC recommends additional field surveys and protective mitigation measures.

Accordingly, the PRMD typically follows the following procedures to reduce the degradation of cultural and paleontological deposits.[36] As described in Policy **OSRC-19f**, a referral is sent to the NWIC for new discretionary development proposals. If the NWIC responds with a request for an archeological or paleontological survey, the PRMD generally requires it from the project applicant before proceeding with the environmental review. When the survey is prepared, the archaeologist and / or paleontologist typically include a recommendation that, in the event resources are discovered during ground disturbance, work is to stop, an archaeologist and / or paleontologist consulted, and their recommendations followed. Occasionally, the NWIC might not request such a study but would recommend this same condition (i.e., work stoppage in the event resources are discovered).

If the NWIC does not respond to a referral, there may be no mitigation to protect previously unidentified archeological and / or paleontological resources that are found during ground disturbing activities. As a result, future ground disturbing activities may result in the loss of integrity and information of previously unidentified, buried, or otherwise obscured archaeological and paleontological deposits. In addition, ministerial projects (e.g., agricultural cultivation, single family dwellings on existing lots, or land use activities not subject to permit requirements) would not be subject to these review procedures. Conduct of these uses could disturb remains or archeological and paleontological resources.

Therefore, substantial disturbance of archaeological resources, human remains, or unique paleontological resources from ground disturbing activities resulting from implementation of the *Draft GP 2020* would be a significant impact.

Mitigation Measure 4.10-2 Add new policy to the Open Space and Resource Conservation Element in order to develop and adopt a countywide program for the protection of archeological and paleontological resources. This program would provide guidelines for land uses on parcels identified by the Northwest Information Center (NWIC) as likely to contain human remains or archeological and paleontological resources.

> **Policy OSRC-19k**: Develop an archeological and paleontological resource protection program that provides:
>
> (1) Guidelines for land uses and development on parcels identified as containing such resources;
>
> (2) Standard project review procedures for protection of such resources when discovered during excavation and site disturbance; and
>
> (3) Educational materials for the general public on the identification and protection of such resources.

[36] Nichols • Berman communication with Kathi Jacobs, Planner III, Sonoma County PRMD, February 2005.

Significance After Mitigation While implementation of Mitigation Measure 4.10-2 would reduce the *Draft GP 2020* impact on human remains and archeological and paleontological resources, it would not do so to a less-than-significant level. This would be a significant unavoidable impact. **(SU)**

Responsibility and Monitoring The Board of Supervisors would be responsible for adopting the above policy as part of the *GP 2020.* The PRMD would be responsible for monitoring the implementation of this program.

4.11 VISUAL RESOURCES

4.11 VISUAL RESOURCES

Visual Resources – Environmental Setting

This section addresses impacts on the visual resources and aesthetic character of Sonoma County's natural environment. Issues include potential impacts to scenic views and vistas, and impacts associated with an increase of urban light sources within the area. The topics discussed in this section overlap with other sections of this EIR, including the ***Sections 4.1 Land Use***, ***Population, and Housing***; ***4.6 Biological Resources***; ***4.8 Agricultural and Timber Resources***; and ***4.10 Cultural Resources***. Visual resource impacts are most closely related to the Open Space and Resources Conservation Element of the *Draft GP 2020.*

The unique scenic quality of Sonoma County results from the attractiveness and diversity of its landscape. Visual characteristics of Sonoma County range from the flat valley floors where vineyards dominate the landscape to the mountain ranges in the northwest and eastern portions of the county. Redwood forests and the coastal mountain range are prominent in the west. Rolling foothills and grazing lands form the visual landscape in the southern portion of the county. However, a significant characteristic of the quality of Sonoma County's scenic environment is the interface of small rural communities and the natural landscape.

Three main highway corridors pass through the county, generally following a north-south course that parallels both the coastline and the mountain ranges. US 101 runs through the center of the county, traversing its entire length and passing through the major urbanized areas. It is along this highway that urban development is most noticeable. Highway 12 runs from the Napa County line north to Santa Rosa on the southeastern side of the county and then west to Sebastopol. The rural ambiance, steep mountains, and broad grasslands along the Sonoma Valley portion of this highway have earned it a State Scenic Highway designation. Highway 116 from Sebastopol through the Lower Russian River area has been similarly recognized for its unique beauty. Highway 1 runs along the western edge of the county, generally following the coastline. The magnificent views of the Pacific Ocean, coastal bluffs, wide coastal terraces, and redwood groves distinguish this part of the county from the others. Visible from many parts of the county and beyond, the 4,345 foot majestic Mount Saint Helena is a key component of the county's landscape.

Sonoma County also has a number of unique geologic formations. The granite on Bodega Head is the dominant surface exposure of this Pacific plate formation in the area. Serpentine exposures in the northern half of the county develop unique soils that support a distinctive vegetation community with rare plant species. In addition, large blocks of serpentine frequently form visible knobs and ridges, comprising a somewhat unique landscape. Mount Saint Helena, Sonoma Mountain, and other prominent peaks of Napa and Sonoma counties dominate the visual landscape in eastern Sonoma County.

The existing General Plan establishes three types of scenic resources that signify particularly important areas of the county that warrant protection; Community Separators, Scenic Landscape Units, and Scenic Corridors. Each of these scenic resource areas are discussed below.

COMMUNITY SEPARATORS

Community Separators were created as an open space category in the County's first *General Plan*. The purpose is to avoid urban sprawl and corridor-style urbanization, in which there is little distinction between communities, by keeping some land areas open or otherwise retaining a rural character. Eight areas totaling approximately 17,315 acres of land are identified by the County as key lands to be protected from urbanization in order to retain distinct, identifiable cities and communities. The main function of the Community Separators is to provide visual relief from urban development; however, they also serve to contain urban development due to their strategic location. The following eight Community Separators are identified in the existing *General Plan:*

- *Petaluma / Novato* – approximately 2,755 acres between Petaluma and the Marin County line. Dominant features include rolling hills with trees and farms located along the valley floor.
- *Petaluma / Rohnert Park* – approximately 3,360 acres between Petaluma, Penngrove and Rohnert Park / Cotati, including Liberty Valley which has outstanding views.
- *Rohnert Park / Santa Rosa* – approximately 1,700 acres between Rohnert Park and Santa Rosa. Large parcels along Stony Point Road and Petaluma Hill Road create relief from the urban area and provide views of fields and hills.
- *Santa Rosa / Sebastopol* – approximately 1,400 acres between Santa Rosa and Sebastopol. Some strip development exists along the Route 12 corridor between these cities; however scenic views of the Laguna de Santa Rosa, oak studded pastures, and Mount Saint Helena remain.
- *Windsor / Larkfield / Santa Rosa* – approximately 2,000 acres along the US 101 and Old Redwood Highway corridors between Santa Rosa, Larkfield-Wikiup, and Windsor. Significant views are available to the west across fields and vineyards to the Mendocino Highlands and to the east over the Mark West Springs Hills to Mount Saint Helena.
- *Windsor / Healdsburg* – approximately 1,200 acres along the US 101 corridor between Windsor and Healdsburg. With rolling hills to the east of the freeway, this separator maintains Windsor and Healdsburg as distinct cities.
- *Northeast Santa Rosa* – approximately 3,500 acres along Highway 12 near Oakmont and to the northeast of Santa Rosa. This separator follows the ridgeline above Rincon Valley northwest of Calistoga Road and includes scattered rural residential developments and open oak woodlands.
- *Glen Ellen / Agua Caliente* – approximately 1,400 acres between Glen Ellen and Agua Caliente / Boyes Hot Springs along Highway 12. This separator extends through the Valley of the Moon and provides expansive views of the Sonoma-Napa Mountains and vineyard covered hillsides.

SCENIC LANDSCAPE UNITS

There are numerous natural features within Sonoma County that are highly scenic and of special significance. These landscapes have little capacity to absorb development without impacting the scenic value. Fifteen Scenic Landscape Units are designated in the existing *General Plan* to help protect these features. Some of these units are in close proximity to the county's urbanized areas. The primary function of the Scenic Landscape Unit designation is to protect the scenic quality of these areas.

The major Scenic Landscape Units are identified in the existing *General Plan*:

- *The Coast* – Three basic types of landscapes are included in the coast unit: the flat terraces south of the Russian River, the hilly terraces from Fort Ross northward, and the cliffs and landslide area in between.

- *Oat Valley* – Oat Valley and the hillsides above it provide the scenic northern entrance to the county near Cloverdale.

- *Alexander and Dry Creek Valleys* – Agricultural marketing in these valleys is closely tied to the area's scenic image and therefore protection of these scenic units is economically, as well as visually, important.

- *Hills East of Windsor* – These hills provide a scenic backdrop to the Santa Rosa Plain. North of Windsor the area extends into the plain and adjoins the low, rolling hills that form part of the Windsor / Healdsburg Community Separator (described above).

- *Eastside Road* – This area of rolling hills follows Eastside Road south of Windsor to River Road in Trenton. It provides a transition between the community of Windsor and the rich agricultural and mineral resource areas of the Russian River Valley.

- *River Road* – This area follows River Road from the Russian River east to US 101. It includes a variety of landscapes, such as valleys planted in vineyards, orchard covered hillsides, and redwood groves adjacent to the Russian River.

- *Laguna de Santa Rosa* [1] – This area consists primarily of the scenic lowlands and the floodplain around the Laguna de Santa Rosa marsh, swamp, and riparian forest. It also includes hills between Forestville, Sebastopol, and Meacham Hill. It defines the eastern boundary of Sebastopol and the associated rural residential development.

- *Bennett Valley* – Bennett Mountain forms a scenic backdrop from Bennett Valley Road. This area defines Santa Rosa's southeastern boundary and abuts Annadel State Park.

- *Highway 116* – The view corridor along the northern part of Highway 116 contains unique views of orchards, redwood groves, and the Russian River. This area also defines the community boundaries of Forestville, Guerneville, Monte Rio, and the adjacent rural residential developments.

- *Atascadero Creek* – This area consists primarily of the lowlands and floodplains along Atascadero Creek and the hills along Occidental Road. The area defines the western boundary of Sebastopol and its adjacent rural residential development, separates Sebastopol and Graton, and creates a visual connection to the Laguna de Santa Rosa.

- *Coleman Valley* – The Coleman Valley Road area, northeast of Bodega Bay, contains unique views of forests, canyons, grazing lands, and ocean.

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1 Three areas of this Unit have been annexed by a city but should still be considered part of a Scenic Landscape Unit because they were annexed solely for agricultural irrigation under the Santa Rosa Subregional Reclamation System.

- *Sonoma Mountains* – These scenic lands clearly define the eastern edge of the Santa Rosa plain between Petaluma and Sonoma. They provide an important backdrop to the urban valley.

- *Hills South of Petaluma* – These open grassy hillsides and ridgelines provide a scenic southern gateway to Sonoma County from Marin County.

- *Sonoma Valley*[2] – Included in this area are the Sonoma-Napa Mountains, which provide a backdrop to the valley and the agricultural areas bordering the valley. This area defines the boundaries of the urban and rural communities.

- *South Sonoma Mountains* – These hillsides are an important part of the south county landscape with a simple landform, minimal vegetation, and a widespread viewing area. Pasture and forage lands along the Highway 37 corridor are included to preserve views of the San Pablo Bay.

Some Scenic Landscape Units on hills and ridges do not extend up to and over the crest of the respective hill or ridge. Projects built on the hill or ridge just outside the boundary of the Scenic Landscape Units have resulted in some reduction in the visual and scenic quality and character of these hills and ridgelines.

SCENIC HIGHWAYS AND SCENIC CORRIDORS

Many of the roadways throughout Sonoma County offer views of some of the most scenic areas. An extensive network of Scenic Corridors and Scenic Highways are designated in the *Draft GP 2020* and are protected by development standards.

The State of California has officially designated two *Scenic Highways* in Sonoma County that have a total length of approximately 40 miles. The criteria for official designation and eligibility includes the scenic quality of the landscape, how much of the natural landscape can be seen by travelers, and the extent to which development intrudes upon the traveler's enjoyment of the view.

The officially designated Scenic Highways are Highway 116, from Highway 1 to the Sebastopol city limit, and Highway 12, from Danielli Avenue east of Santa Rosa to London Way near Agua Caliente. Highway 116 passes a historic resort area along the Russian River, then through second growth redwood forests and eucalyptus groves. Highway 12 is located in the Valley of the Moon, with mountain ridges lying to the north, east, and southwest, and passes through extensive vineyards and oak groves.

Sonoma County has designated an extensive network of roadways as *Scenic Corridors*. This network threads throughout the unincorporated area, offering a diversity of viewsheds to travelers. They include State Highways 1, 12, 37, 101,116, 121, and 128. County roadways include Skaggs Springs Road, River Road, Chalk Hill Road, Lakeville Highway, Bennett Valley Road, Dry Creek Road, Mark West Springs Road, Arnold Drive, Petaluma Hill Road, Bodega Avenue, Fulton Road, and many more.

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2 One area of this Unit has been annexed by a city and is no longer part of this Scenic Landscape Unit.

GREENBELTS, GREENWAYS, AND EXPANDED GREENBELTS

Greenbelts, although not officially recognized in the existing *General Plan*, are areas that function as open space buffers around cities and county urbanized areas, much like Community Separators. These areas are eligible for protection by the Sonoma County Agricultural Preservation and Open Space District (SCAPOSD). Acquisition of conservation easements and fee title of land within greenbelts can significantly contribute toward permanently preserving lands adjacent to cities for important agricultural, scenic, recreational, and natural resource purposes. Greenbelts are also areas where acquisition can achieve multiple conservation goals. The SCAPOSD *Acquisition Plan 2000* designates two types of greenbelts in the plan: *Priority Greenbelts*, including greenways, and *Expanded Greenbelts*. [3]

The *Greenbelt Acquisition Category* encompasses lands within Community Separators and Scenic Landscape Units, as well as other important lands identified for their scenic value in city general plans.

Priority Greenbelts are lands in close proximity to incorporated cities that have one or more desirable characteristics, such as high visual quality. Priority Greenbelts are frequently lands where multiple conservation goals can be achieved and in many cases they overlap with the Scenic Landscape Units. Eleven Priority Greenbelts are identified in the *Acquisition Plan 2000*:

- *Cloverdale* – This greenbelt wraps around the western and southwestern edges of Cloverdale and includes part of the Oat Valley Scenic Landscape Unit.

- *Healdsburg / Windsor* – This greenbelt wraps around the eastern side of Healdsburg, the northeastern edge of Windsor, and along Eastside Road to the east of Windsor. It includes parts of the Windsor / Healdsburg and Windsor / Larkfield / Santa Rosa Separators as well as the Eastside Road, the Hills East of Windsor, and a portion of the Alexander Valley Scenic Units.

- *Windsor / Santa Rosa* – This greenbelt runs from the northwestern part of Santa Rosa to the southeastern edge of Windsor, mainly along the US 101 corridor. It includes part of the Windsor/Larkfield/Santa Rosa Separator and part of a Scenic Unit north of Santa Rosa.

- *Sebastopol / Santa Rosa* – This greenbelt runs from the eastern edge of Sebastopol to the southwestern corner of Santa Rosa. It includes all of the Santa Rosa / Sebastopol Separator and part of the Laguna de Santa Rosa Scenic Unit.

- *Taylor Mountain* – This greenbelt is on the southeastern corner of Santa Rosa and includes part of the Bennett Valley Scenic Unit.

- *Sonoma Valley* – This greenbelt follows the Highway 12 corridor and includes parts of the Northeast Santa Rosa and Glen Ellen / Agua Caliente Separators as well as parts of the Sonoma Valley Scenic Unit.

- *Santa Rosa / Rohnert Park* – This greenbelt runs along the northern and western sides of Rohnert Park. It includes most of the Rohnert Park / Santa Rosa Separator as well as part of the Laguna de Santa Rosa Scenic Unit.

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[3] *Acquisition Plan 2000; A Blueprint for Agricultural and Open Space Preservation*, Sonoma County Agricultural Preservation and Open Space District, July 2000.

- *Sonoma Mountain* – This large greenbelt covers much of the area east of Rohnert Park, Cotati, and Petaluma, and west of Sonoma. It includes the Sonoma Mountains Scenic Unit.

- *Rohnert Park / Petaluma* – This greenbelt continues down the US 101 corridor from Cotati where it connects with the Santa Rosa / Rohnert Park Greenbelt. It includes parts of the Petaluma / Rohnert Park Separator.

- *Napa / Sonoma* – This greenbelt is at one of the southern entrances from Napa County on Highway 121 and includes part of the Sonoma Valley Scenic Unit.

- *Sonoma / Marin* – This greenbelt continues from the southern end of the Sonoma Mountain greenbelt east of Petaluma along Lakeville Highway. It includes the Petaluma/Novato Separator and part of the South Sonoma Mountains and the Hills South of Petaluma Scenic Units.

Greenways are linear open space corridors that run along creek channels and are a noteworthy part of the Priority Greenbelts designation. They are identified by the *Acquisition Plan 2000* along all or part of a number of the county's creeks, including the Mayacamas Creek east of Healdsburg, the Mark West Creek north of Santa Rosa, the Santa Rosa Creek east of Santa Rosa, the Sonoma Creek, the Laguna de Santa Rosa, and two streams northeast of Sonoma.

Expanded Greenbelts are those rural open space lands that provide a one-mile buffer beyond cities and highways as extended protection areas. These lands generally serve to help preserve rural character. While there is some overlap with the Scenic Landscape Units, the Expanded Greenbelts generally comprise a constant one mile band along the major roadways and urbanized areas in the county, while the Scenic Units are more limited in scope. Expanded Greenbelts are identified along the entire length of Highway 128, Highway 12, Highway 121, and Highway 37, along parts of US 101, Highway 116, and surrounding Cloverdale, Healdsburg, Windsor, Santa Rosa, Sebastopol, Sonoma, Petaluma, and Rohnert Park.

NIGHTTIME SKY

Landforms generally cannot be seen at night. Rather, the location, type, and quantity of light sources become the important visual factors. Nighttime sources of light can include vehicle headlamps, streetlights, decorative outdoor landscape or security lighting, and interior lighting. Highly visible lights at night can disrupt views of the nighttime sky and have the potential to be seen for miles if geography and landscaping do not intervene. Moving sources of light and glare (e.g., vehicles) easily catch the eye and are difficult to ignore.

Light pollution is any adverse effect of man made light and can include urban sky glow, glare, and light trespass. Such excessive lighting can significantly change the character of rural and natural areas by making the built environment more prominent at night and creating visual clutter. It can waste energy, money, and natural resources. [4]

Also referred to as *sky glow*, light pollution is a result of outdoor lighting that is directed to or reflected to the sky. It creates the haze or glow of light that surrounds highly populated areas, reduces the ability to view the night time sky, and changes the character of the night sky. The sky glow

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4 *The Problem with Light Pollution*, International Dark-Sky Association, Information Sheet 1, May 1996.

phenomenon is a result of light reflected from atmospheric particles, such as fog, dust, or smog. This is typically caused by excess light entering the sky either from a laminar directed above the plane of the horizon, or light reflected from a surface to the sky. Sky glow is of particular concern in areas near observatories, as light emitted or reflected into the sky interferes with the ability of the observatory and the public to view the sky in an unobstructed manner. [5] [6]

Visual Resources – Regulatory Setting

COUNTY REGULATIONS

The existing *General Plan* primarily provides visual preservation and design policy in areas designated as Scenic Landscape Units, Community Separators, and Scenic Corridors. In these areas, design review is required and occurs through the following processes: as required by Area Plans (e.g., the Bennett Valley Area Plan); as required through the Use Permit process; for certain uses in commercial or industrial zones; and as required by the Scenic Resources and Scenic Design Districts of the Zoning Code. [7] Existing regulations also include requirements for design review, use permits, and other discretionary project entitlements outside of those areas. These regulations allow for mitigation of visual impacts as part of the environmental review process.

Community Separators

Approved by Sonoma County residents in a special election in 1996, County Ordinance No. 5003R requires voter approval for a revision or amendment to the boundaries or land use designations and densities of the Community Separators as designated in the existing *General Plan Open Space Element*. The requirements of the Ordinance go into effect relative to a particular Community Separator only when the voters of the city associated with the Community Separator have approved a measure meeting the certain requirements. Most Sonoma County cities have approved such a measure. The ordinance also allows for the adoption of an amendment to the existing *General Plan* without voter approval if it creates or adds additional area to existing separators, involves no net loss in area, or changes land use designation within the Community Separator so as to maintain or improve the open space character in accordance with County and State policies.

County Ordinance No. 5145R was approved by Sonoma County residents in a special election in 1998 and expanded the Petaluma / Novato Community Separator. It requires voter approval of any increase in the allowed density or intensity of land uses allowed within that area. This ordinance gives additional assurance that certain proposed US 101 improvements would not lead to development in this separator exceeding that currently allowed by the existing *General Plan*.

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5 There are three observatories in Sonoma County: the Ferguson Observatory in Sugarloaf Ridge State Park, operated by the Valley of the Moon Observatory Association; the Hume Observatory in Pepperwood Nature Preserve northeast of Santa Rosa, operated by the California Academy of Sciences; and the Sonoma State University Observatory located on their campus west of Rohnert Park.

6 *White Paper on Outdoor Lighting Code Issues,* National Electrical Manufacturers Association, August 2000.

7 *Rural Character Design Standards,* CAC memo, Denise Peter, Sonoma County PRMD, November 21, 2002.

Development within Community Separators is subject to the standards in the Sonoma County Zoning Code. These standards are designed to reduce the visibility of land uses and development from public roads so that the Community Separator maintains an open and undeveloped appearance.

Scenic Landscape Units

The Zoning Code also includes standards for the development within Scenic Landscape Units. These development standards also reduce the visibility of permitted development in order to maintain the natural appearance of the landscape as much as possible.

Scenic Corridors

The County's protective measures for the Scenic Corridors rely on Sonoma County zoning regulations to control the visual impact of development, primarily through the use of the Scenic Resources (SR) overlay zoning district, as well as through the design review process. The SR overlay district establishes a setback of 30 percent of the lot depth up to a maximum of 200 feet from the centerline of the road. Within this area, development is prohibited with certain exceptions.[8] The design review process requires that all development in certain zoning districts is reviewed by the planning director or an appointed design review committee to assure that it meets certain standards.

Scenic Highways

As noted above, portions of two State Highways are designated for scenic protection, Highways 12 and 116. The Highway 12 route through Sonoma Valley is governed by both the Scenic Design (SD) district and the Scenic Resource (SR) district. The standards in the SD district provide for screening of development from the view of Highway 12 travelers. The SR district protects views from all public roads.

The Highway 116 route is protected by the Highway 116 Scenic Highway Study. This study includes an array of policies and standards that protect the unique rural character of this route.

Nighttime Sky

There are no adopted county-wide policies or regulations that apply to the protection of the nighttime sky, nor do all design review or Use Permit approvals contain lighting conditions. The Zoning Code specifically regulates lighting for parking lots where a design review application is required, for Appurtenant Signs, and for projects within three Local Area Development Guidelines areas.[9, 10]

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8 *Highway 116 Scenic Highway Study*, CAC memo, Denise Peter, Sonoma County PRMD, August 15, 2002.

9 These are: Highway 12 Design Guidelines, Glen Ellen Development Guidelines, and the Taylor Mountain/Sonoma Mountain Development Guidelines.

10 *Light and Glare Policies*, CAC memo, Denise Peter, Sonoma County PRMD, August 15, 2002.

STATE REGULATIONS

Scenic Highways

California's Scenic Highway Program was created by the California Legislature in 1963. Its purpose is to preserve and protect scenic highways from change that would diminish the aesthetic value of lands adjacent to highways. Highway 116 and Highway 12 are both Sonoma County Scenic Highways. [11]

The text of the code includes a list of additional roadways that are eligible for designation as *Scenic Highways*. Roadways on this list are not officially designated Scenic Highways until the following steps have been completed: 1) the local jurisdiction adopts a scenic corridor protection program, 2) the local jurisdiction applies to the California Department of transportation for scenic highway approval, and 3) the local jurisdiction receives notification from Caltrans that the highway has been designated as a Scenic Highway. State legislation is required to add routes to the list of eligible highways.

Official designation as a California Scenic Highway provides certain protections to the route as well as the surrounding corridor. The corridor is defined as "the band of land generally adjacent to the highway right-of-way." Protections are determined by the local governing agency but are subject to minimum State requirements set out in Section 261 as follows:

> *The standards for official scenic highways shall also require that local governmental agencies have taken such action as may be necessary to protect the scenic appearance of the scenic corridor … including, but not limited to (1) regulation of land use and intensity (density) of development; (2) detailed land and site planning; (3) control of outdoor advertising; (4) careful attention to and control of earthmoving and landscaping; and (5) the design and appearance of structures and equipment.*

Both Caltrans and the Public Utilities Commission (PUC) have practices and procedures in place that apply to all officially designated State Scenic Highways. Caltrans' protective measures focus on minimizing tree removal and damage to trees. The PUC has language in its code that indicates the Commission's intent to install underground utilities, whenever feasible, when those utilities are proposed in proximity to a designated Scenic Highway.

Nighttime Sky

In 2001 the California State Legislature passed a bill requiring the California Energy Commission to adopt energy efficiency standards for outdoor lighting in both the public sector and the private sector. The Commission is now in the process of developing and adopting lighting standards for all outdoor lighting applications, including all non-conditioned areas that are not already subject to existing California standards. The Commission adopted changes to the Title 24, parts 1 and 6, Building Energy Efficiency Standards on November 5, 2003. These new Standards became effective on October 1, 2005. Included in the changes to the Standards are new requirements for outdoor lighting. The Commission anticipates that the new standards will improve the quality of outdoor lighting and may reduce the impacts of light trespass, glare, and light pollution. [12]

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11 *The California Scenic Highway Program*, Caltrans web site, http: //www.dot.ca.gov/hq/LandArch/scenic/scpr.htm.

12 *California Outdoor Lighting Standards Synopsis*, Eley Associates, February 1, 2002.

Visual Resources – Significance Criteria

According to the *State CEQA Guidelines* and the existing *General Plan*, the project would have a significant visual resources impact if it would:

- Be in conflict with a designated Community Separator, Scenic Landscape Unit, or Scenic Corridor;
- Have a substantial adverse effect on a scenic vista;
- Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings and historic buildings within a State scenic highway;
- Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area;

Visual Resources – Impacts and Mitigation Measures

INTRODUCTION

The *Draft GP 2020* recognizes the need to protect Sonoma County's visual resources and would do so through the use of designations for some of the most scenic lands as Community Separators, Scenic Landscape Units, or Scenic Corridors. In addition, the County recognizes the need to protect the scenic quality of its rural and urban communities.

While land designated as a Community Separator, Scenic Landscape Unit, or Scenic Corridor (and appropriately zoned under the Scenic Resources overlay district) would be afforded greater protection from visual impacts by policies of the *Draft GP 2020*, it is important to note that such designation does not preclude development on these lands. Designated parcels would continue to have an underlying land use designation that would allow the development of certain land uses that could adversely affect visual resources.

For instance, much of the land within Community Separators is designated for agricultural or rural residential uses. As discussed in ***Section 4.8 Agricultural and Timber Resources***, an agricultural designation of LEA, LIA, or DA would permit other land uses to occur in addition to agricultural production. These uses include: agricultural processing; support services (e.g., sales of farm supplies); visitor-serving uses (e.g., tasting rooms); agricultural employee housing; surface mining operations (if consistent with the Aggregate Resources Management Plan); recreational uses (e.g., campgrounds); and community services facilities (e.g., churches, schools, and granges).

In addition, the County is limited in the extent to which it can protect visual resources. First, the designated scenic areas do not include all of the rural parts of Sonoma County. Second, limits to the County's authority to regulate development on existing rural lots means that some structures are going to continue to be built regardless of adopted scenic protection policies.

Impact 4.11-1 Community Separators, Scenic Landscape Units, Scenic Corridors, and Scenic Highways

*Land uses and development consistent with the Draft GP 2020 could impact the visual quality of Community Separators, Scenic Landscape Units, Scenic Corridors, and Scenic Highways. However, policies contained in the Draft GP 2020 and the Sonoma County Code would continue to strictly limit the intensity, density, and location of development within these areas and reduce the visual impact on such lands to a less-than-significant level. (**LTS**)*

Community Separators

There are eight Community Separators as described in the environmental setting to which changes have occurred since adoption of the existing *General Plan*. The proposed Community Separators are illustrated in Figures OSRC 5a through OSRC 5i in the Open Space and Resources Conservation Element. The *Draft GP 2020* proposes reductions in acreage to some Community Separators in order to reflect previously approved city annexations. Otherwise, the *Draft GP 2020* does not include any land use amendments that would directly change either the land use designation and / or allow an increase in development potential at higher residential or commercial densities within Community Separators. [13]

Development pressure within Community Separators would be mostly due to the expansion of Sonoma County's cities. Additional development pressure could result from the location of this land along major arterial roads and the US 101 corridor, and from the potential for great financial gain through conversion of this land to residential or commercial uses. This pressure would reasonably be expected to continue and could result in the loss of vacant land to development and annexation, an increase in allowed density above the maximum permitted one dwelling unit per ten acres, and corridor style urbanization along US 101. Cumulative impacts to visual resources resulting from such pressures are discussed in ***Section 6.2 Cumulative Impacts***. Development within Community Separators could also occur as a result of voter approved projects or through permitted uses of the underlying land use designation. Examples of permitted land use activities for agricultural designations which comprise the majority of lands within the Community Separators are discussed in *Impact 4.8-1 Conversion of Agricultural Lands to Non-Agricultural Uses.*

As Community Separators provide visual relief between urban areas, the development of these lands could result in corridor style urbanization and adverse changes to the visual quality of Sonoma County. Corridor style urbanization, so prevalent in many of California's urban areas, is characterized by uninterrupted residential subdivisions and commercial development. This type of development within Community Separators would result in a loss of community identity and uniqueness.

One goal of the SCAPOSD is to preserve agricultural land and natural resource areas, thereby protecting the visual quality of the unincorporated area, through open space acquisitions and conservation easements. As described in ***Section 4.8 Agricultural and Timber Resources***, the SCAOSPD has no powers of eminent domain but has funding to purchase interests in real property from willing sellers. The SCAPOSD adopted *Acquisition Plan 2000* in July 2000 to direct land conservation efforts and set land acquisition priorities.

In addition, the *Draft GP 2020* contains policies that would also reduce adverse changes to the scenic quality of Community Separators. Policy **OSRC-1a** would continue to maintain the integrity of Community Separators by avoiding the approval of land use amendments that increased residential

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[13] See **Exhibit 4.1-2** for a list of the proposed land use amendments.

densities in Community Separators above one dwelling unit per ten acres. In addition, Policy **OSRC-1b** would continue to avoid the development of visually incompatible commercial and industrial uses in Community Separators (except for uses permitted by agricultural or resource land use categories) as well as limit recreational uses to locations along the US 101 corridor.

Policy **OSRC-1c** would continue to provide guidelines to permit some development providing certain criteria are met that would reduce both adverse changes to the scenic quality as well as result in long-term open space preservation and additional substantial public benefit. These would include, as conditions of approval, the dedication of a portion of the parcel(s) as permanent open space, the clustering of structures, and requiring that the project be of substantial public benefit which would outweigh the impacts of placing the development within the Community Separator. Additionally proof of adequate public services and infrastructure to serve the project would be required prior to approval. Special consideration would be given to projects containing financing mechanisms that would preserve dedicated open space or park land and project design that would visually enhance the separator or provide public access. As a result, this policy would reduce the cost to the County of maintaining acquired open space land and would allow the public to enjoy the visual relief and scenic quality that these lands provide.

Policies **OSRC-1d** through **OSRC-1f** would apply the Scenic Resources Combining District (SR) zoning overlay and establish design standards for development and land uses within Community Separators. The SR zoning overlay would reduce visual impacts to Community Separators by applying design standards which include regulating building envelopes and structure height limits, requiring the clustering of structures, and minimizing both the removal of tree stands cuts and fills on hills and ridges.

Policies **OSRC-1g** through **OSRC-1h** would implement financial and political mechanisms necessary to maintain Community Separators. Policy **OSRC-1g** would continue the work of the SCAPOSD in acquiring lands within Community Separators and elsewhere by supporting a measure on the ballot to extend the SCAPOSD and the sales tax (scheduled to expire in 2010) for another 20 years. Policy **OSRC-1h** would reduce visual impacts and maintain the integrity of Community Separators by considering creative financial and development options like voluntary transfer development rights (TDR) and purchase development rights (PDR). Policy **OSRC-1i** would specifically prohibit any change to a land use designation that would increase residential or commercial development potential in the Novato – Petaluma Community Separator without prior voter approval. This policy would likely discourage land use amendments and development proposals within this area due to the prohibitive cost of obtaining voter approval and the presumed public support for preservation of Community Separators.

In addition to the *Draft GP 2020* policies discussed above, Sonoma County has two existing ordinances that would continue to regulate development within Community Separators. Ordinance 5003R requires voter approval for the revision of or amendment to the boundaries or land use designations and densities of Community Separators as designated in the Open Space and Resources Conservation Element of the existing *General Plan*.[14] This ordinance would give a higher level of assurance that Community Separators would not be reduced in size or have their land use regulations relaxed during the foreseeable future and encourages the county's nine incorporated cities to adopt voter-approved companion ordinances establishing urban growth boundaries.

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[14] Ordinance 5003 R was approved by Sonoma County voters on November 5, 1996.

In a similar fashion, Ordinance 5145R expanded the Petaluma – Novato Community Separator and requires voter approval of any increase in the allowed intensity or density of land uses in this area. [15] This ordinance would ensure that certain Caltrans proposed US 101 improvements would not lead to development within this Community Separator at densities above those outlined in the existing *General Plan*. [16]

Scenic Landscape Units

Scenic Landscape Units face many of the same potential impacts as do Community Separators because such designation does not preclude development of these lands. Policies contained in the Land Use and Agricultural Resources Elements that would permit certain land use activities consistent with the underlying land use designation (e.g., agricultural processing and visitor-serving development) could degrade the visual quality of Scenic Landscape Units.

The *Draft GP 2020* proposes modifications in several Scenic Landscape Units throughout the nine Planning Areas, primarily to adjust the boundaries to extend up to and over ridgelines. The proposed Scenic Landscape Units are illustrated in Figures OSRC 5a through OSRC 5i in the Open Space and Resources Conservation Element of the *Draft GP 2020*

The *Draft GP 2020* does not propose any land use amendments that would directly change either the land use designation and / or allow an increase in development potential at higher residential or commercial densities within Scenic Landscape Units.

Potential adverse changes to the scenic quality of Scenic Landscape Units could occur as a result of the development of vacant lands and permitted land use activities. However, policies contained in the *Draft GP 2020* and the County Zoning Code would reduce many of the visual impacts in these areas.

Policy **OSRC-2a** would continue to avoid amendments which would increase residential density in excess of unit per ten acres. Development at or below this density would preserve open space, maintain the visual character of rural Sonoma County, and provide visual relief from urban areas. Policy **OSRC-2b** would prevent the development of visually incompatible commercial and industrial uses from degrading the scenic quality of Scenic Landscape Units.

Policy **OSRC-2c** would continue to apply the Scenic Resources Combining District (SR) to lands designated Scenic Landscape Units. The SR zoning overlay contains provisions for reducing visual impacts similar to those described in Policies **OSRC-2d** and **ORSC-2e.** These would include, but are not limited to, requiring the use of vegetation and existing topography to screen development; requiring additional landscaping in open areas not screened by existing vegetation and topography; discouraging cuts and fills on hillsides; locating structures so as to minimize tree removal; the underground placement of utilities; architectural design review of structures to promote compatibility with surrounding uses and existing visual character; and the use of height limitations, building envelopes, clustering, and tree preservation for residential subdivisions within the Scenic Landscape Unit. The incorporation of these standards into the zoning code would ensure that adverse changes to

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15 Ordinance 5145 R was approved by Sonoma County voters on November 3, 1998.

16 *Open Space Element – Community Separators and Scenic Landscape Units*, Lisa Posternak, Sonoma County PRMD, September 19, 2002.

the scenic quality of these lands would be reduced during the design review phase for both ministerial and discretionary projects.

Policy **OSRC-2f** would continue to identify critical scenic areas within Scenic Landscape Units and, to the extent allowed by law, require the dedication of a permanent scenic or agricultural easement before the approval of subdivision of property. Additionally, Policy **OSRC-2g** would continue to consider transfer of development rights (TDR) and purchase of development rights (PDR) programs within Scenic Landscape Units. These programs would add protection and thereby reduce visual impacts through the permanent preservation of open space.

Ridges and hillsides within Scenic Landscape Units, such as the Sonoma and Mayacamas Mountains, or those within view from the Scenic Corridors, are some of the county's principal scenic resources and contribute substantially to Sonoma County's unique visual and rural character. Despite constraints to development from natural hazards and topographical features, hillsides and ridgelines are attractive places to live because of their views and proximity to nature. But, excessive or poorly located hillside development can diminish these views, idyllic surroundings, and wildlife habitats and permanently change the character of the community. Ridges and hillsides within Scenic Landscape Units along Scenic Corridors would be particularly sensitive to development.

Policy **OSRC-2d** would reduce visual impacts along designated hillsides and ridgelines by avoiding the placement of structures in locations that would exceed the silhouette of the ridgeline against the sky or in highly visible open areas. Furthermore, projects would be required to minimize cuts and fills on hills and ridges and screen driveways from view. Additional provisions applicable to hillside and skyline protection are included in the SR zoning overlay. Adverse changes to the scenic quality of Scenic Landscape Units would be reduced by these policies, particularly on hillsides and ridgelines.

Scenic Corridors

Similar to Community Separators, and Scenic Landscape Units, Scenic Corridors could be affected by land use activities. Depending on the type of land use and development allowed along designated scenic corridors, rural and /or urban uses could be located or designed in ways that are visually obtrusive to travelers. In urban communities, projects could alter the character of communities. In rural areas, land uses could adversely affect the natural scenic environment. Billboards and similar outdoor advertising structures could detract from scenic views. Scenic corridors are identified on Figures OSRC 5a through OSRC 5i of the Open Space and Resources Conservation Element.

The *Draft GP 2020* contains policies that would reduce the potential impacts on the visual quality of Scenic Corridors. Policy **OSRC-3a** would continue to apply the Scenic Resources Combining District (SR) zoning overlay to portions of property within a scenic corridor setback. [17] Policy **OSRC-3c** would continue to define this setback as 30 percent of the lot depth up to a maximum depth of 200 feet from the road's centerline. Application of the SR overlay would reduce adverse visual changes to Scenic Corridors by promoting uses consistent with the rural character of Sonoma County. Development would be limited within this setback to agricultural and other support structures associated with existing facilities. Furthermore, for those portions of Scenic Corridors located within urban areas, Policy **OSRC-3e** would continue to require and incorporate urban design criteria such as the use of applicable lighting, and the shielding of parking lots from public view.

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[17] *Article 64 Scenic Resources Combining District*, Sonoma County Zoning Code, accessed online at http://www.sonoma-county.org/prmd/Zoning/index.htm.

Policy **OSRC-3g** would reduce the visual impact from outdoor advertising by continuing to avoid freeway oriented billboards along Scenic Corridors and by establishing design criteria for advertising structures and signs. The policy would also consider phasing out existing signs through amortization. Many courts have determined that amortization does not constitute a taking, and is therefore used as a method for removing billboards nationwide.

Policy **OSRC-3h** would continue to require public works projects to minimize tree damage and removal within Scenic Corridors, design appropriate replanting programs, and revegetate after grading and road cuts. In addition to this policy, the Sonoma County Code contains two ordinances that would reduce potential impacts to trees. The Sonoma County Tree Ordinance (No. 4044) would continue to regulate the removal of certain designated trees, including oaks, madrone, redwood, and California bay. *Protected trees* are defined as those designated trees having a minimum trunk diameter of nine inches measured at 4.5 feet above grade. According to the ordinance, protected trees would be replaced at a 1:1 ratio. In addition, the proposed removal could not exceed 50 percent of the protected trees on the site. The Sonoma County Heritage Tree Ordinance No. 3651 would continue to provide for the identification and protection of designated heritage trees.

Additional policies applicable to Scenic Corridors in coastal areas are contained in the Sonoma County Local Coastal Plan (LCP). Policies in the LCP are more restrictive in terms of height limitations new structures and rely on vegetation to screen the project from view. Vegetative screening alone is not always effective because climate factors, plant diseases, and pests result in low survivorship of new landscaping in coastal areas. [18]

Scenic Highways

As previously noted, portions of Highways 12 and 116 are designated as State Scenic Highways. Similar to Scenic Corridors, Scenic Highways can be adversely affected by land uses and development that may be sited near the roadway. These land uses, whether urban or rural, could be developed in ways that are not in keeping with the character of the communities through which travelers pass along these routes.

In 1988, Caltrans, in consultation with Sonoma County staff and the County Scenic Highway Advisory Committee, designated Highway 116 as a Scenic Corridor. These agencies delineated the Highway 116 viewshed and established applicable policies to protect the Scenic Corridor's visual quality. [19] However, during public workshops pertaining to the scope of the *Draft GP 2020* update, comments were received suggesting that scenic protection policies for Highway 116 were not being adequately implemented by the County into the existing *General Plan* or the County Code. [20]

In 2001, Caltrans conducted a staff review of the County's Corridor Protection Programs for Highways 12 and 116. The report concluded these programs were adequate to protect the scenic values of these Scenic Highways.

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[18] *Sonoma County LCP Amendment #1-00*, Peter Douglas, California Coastal Commission, June 29, 2001, accessed online at http://www.coastal.ca.gov/nca/lcpa-sc-1-00.pdf.

[19] *The Final Report of the Sonoma 116 Scenic Highway Corridor Study*, Caltrans, September 1988.

[20] *Highway 116 Scenic Highway Study*, Denise Peter, Sonoma County PRMD, August 15, 2002.

Policy **OSRC-3i** and **OSRC Program 8** (Scenic Highway 116 Program) would continue to recognize Highway 116 as an official State Scenic Highway. If adopted, the program would prepare Local Development Guidelines to be incorporated into the Zoning Code that were identified in the 116 Scenic Highway Corridor Study.

The *Draft GP 2020* contains policies and programs that, if adopted and implemented, would reduce the visual impacts and maintain the visual quality of scenic highways. These include the policies and programs previously discussed under Scenic Corridors. In addition, both highways are protected by zoning standards. The SD and SR districts, cited earlier, protect Highway 12 by requiring that structures be screened from view along the route. Highway 116 is protected, not only by standards in the SR district, but also by Highway 116 Scenic Highway Study, that establishes protective policies for development within the mapped viewshed of the highway. The *Draft GP 2020* would also call for improved implementation of this study's policies and standards. State Scenic Highways are also subject to restrictive State regulations pertaining to outdoor advertising structures, thereby adding protection to the County's billboard policy discussed earlier.

In summary, land uses and development that would be allowed within Community Separators, Scenic Landscape Units, Scenic Corridors, and Scenic Highways could adversely affect the visual quality of these areas. However, the *Draft GP 2020* includes both existing and new policies and programs that would reduce this impact to a less-than-significant level.

Mitigation Measure 4.11-1 None required.

Impact 4.11-2 Visual Impacts in Other Urban and Rural Areas

*Land uses and development consistent with the Draft GP 2020 could impact the visual quality of urban and rural areas that are not designated as scenic resource areas. However, policies contained in the Draft GP 2020 and existing regulations would reduce these impacts to a less-than-significant level. (**LTS**)*

In the preceding discussion regarding designated scenic resources in the *Draft GP 2020*, the impact identification focused on the most important scenic resources in the unincorporated area. This section addresses the visual impacts of land uses and development on the remaining unincorporated area. While these lands, both urban and rural, are not designated scenic resources, they contribute nonetheless to the overall visual quality and character of the county.

Land uses and development in the urban areas could result in the loss of visual quality if the design of structures associated with urban development is not consistent with the style and character of the surrounding uses. Each urban community has a character that was initiated early in its history and has evolved over time. If new development is not consistent with that character it could detract from the visual impression and attractiveness of that community. Building architecture, landscaping, lighting, color, materials, and other design features are all important aspects of this character.

Similarly, rural land uses and development consistent with the *Draft GP 2020* could degrade the visual quality of rural areas and rural communities. Each rural area whether valley floor, rolling hills, mountains, or other topographic feature, has a rural character that identifies it and often makes it unique and different from other rural areas. In these areas, building architecture and structural style may not be as important as the blending of the design and layout of uses with the natural visual environment.

The *Draft GP 2020* includes policies and programs that would address these visual impacts, primarily through the use of urban and rural design guidelines. Policy **OSRC-5b** would establish a set of general design guidelines applicable to land uses and development within Urban Service Areas. These urban design standards would focus on maintaining and enhancing the established character of each community. **OSRC Program 9 Urban Design Standards** would promote the development of additional design standards tailored to the character of each community, as has been done for the communities of Glen Ellen and Occidental.

Policy **OSRC-6a** would establish a set of general design guidelines applicable to projects in rural areas. **OSRC Program 10 Rural Character Design Guidelines** would promote the establishment of more specific guidelines that focus on maintenance of the rural character of agricultural and rural commercial development, not only to protect visual quality, but also to avoid the urban industrial appearance of rural uses. The *Draft GP 2020* would also provide for visual resource protection in areas where Local Area Development Guidelines have been adopted such as the Sonoma Mountains and Taylor Mountain, or areas where new Local Area Development Guidelines are supported such as the Mayacamas Mountains.

These policies and programs would combine with existing regulations discussed in the setting to reduce the impact of future land uses and development outside of designated scenic resource areas to a less-than-significant level.

Mitigation Measure 4.11-2 None required.

Impact 4.11-3 Light Pollution and Nighttime Sky

*Land uses and development consistent with the Draft GP 2020 would create additional sources of lighting which could result in sky glow, light trespass, and glare. This would be a significant impact. (**S**)*

Outdoor lighting used in both the public and private sectors contributes to adverse visual effects on the nighttime sky. Excessive night time lighting resulting from implementation of the *Draft GP 2020* could result in light trespass, light pollution, and glare.

Light trespass is unwanted light from a neighboring property or roadway. The most common form of light trespass is spill light, illuminating objects beyond the property boundaries. Light trespass may be more obtrusive during the late night hours. [21] Light trespass would continue to be an issue as sources of outdoor lighting have and may continue to be more intense than in the past. Additionally, disputes related to light trespass are difficult to resolve due to the need for light during night time activities, particularly for safety and security. Light trespass can be both a nuisance and a health and safety risk if it adversely affects visibility for tasks like driving.

Light pollution has a broader and more cumulative impact than light trespass to Sonoma County residents. Excessive night time lighting could result in sky glow, the haze of light that surrounds highly populated areas and reduces the ability to see the stars. This would be of particular concern near observatories (e.g., the Robert Fergusson Observatory) and could change the appearance of the night time sky for future generations.

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21 *White Paper on Outdoor Lighting Code Issues*, National Electrical Manufacturers Association, August 2000.

Excessive lighting could also have an adverse impact on wildlife. Increased night lighting from development may disrupt important behaviors and physiological processes of animals. Insects, amphibians, and birds are highly sensitive. Lights at night are especially disruptive to wetland birds and land animals, which use light reflected off of water to orient them. Migratory songbirds are also vulnerable, and are killed in large numbers when night-lit buildings attract them off their course. Some animals cannot forage or find mates because they cannot hide from their predators. Owls, foxes, and other predators who hunt by sight may thrive where night lights are strong. [22]

Implementation of the *Draft GP 2020* could also result in glare. Glare is light of such brightness that it continually draws the eye toward the lamp image and / or prevents the viewer from adequately viewing the intended target. Glare commonly occurs when a spot in the field of view is significantly brighter in contrast to the rest of the field of view, such as when a direct lamp image is visible, or when the difference in light levels between adjacent areas is significant enough to cause the eyes to take several minutes to adapt to the change.

The *Draft GP 2020* contains policies and programs to reduce the adverse affects of excessive lighting. Policy **OSRC-4a** would require all lighting to be cast downward and to be at no more than both the minimum height required and the power necessary for the proposed use. This policy would therefore limit excessive lighting, and reduce the amount of wasted light unnecessarily directed upwards, minimizing sky glow. Policy **OSRC-4b** would prohibit continuous all night lighting except for security and operational purposes. This policy would maintain dark skies in rural areas during nighttime hours and result in aesthetic and biotic benefits. Policy **OSRC-4c** would discourage light levels in excess of industry and State standards. This policy would reduce lighting impacts to visual resources by incorporating progressive State and industrial standards into the project design and review process.

An additional program to develop and incorporate standards and procedures into the County Development Code and design review process was included in the *Draft GP 2020*. [23] The development and adoption of **OSRC Program 7**, **Outdoor Lighting Standards** would replace the current method of evaluating lighting impacts on a project by project basis with comprehensive procedures and standards. The consistent application of lighting standards would reduce impacts from lighting to visual resources by addressing the issue in the design review process.

Due to the cumulative nature of lighting impacts, the success of **OSRC Program 7 Outdoor Lighting Standards** in reducing impacts from implementation of the *Draft GP 2020* depends upon a voluntary education and incentive program that encourages progressive methods to retrofit existing light sources to compliant ones. Reducing lighting impacts would also depend upon the degree to which ridgelines, hilltops, scenic resources, and other rural areas would be protected from development consistent with policies contained in the Open Space and Resources Conservation, Agriculture Resources, and Land Use elements of the *Draft GP 2020*.

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22 *Preliminary Evaluation of the Environmental Impacts of a Resort Casino Proposed by the Federated Indians of the Graton Rancheria at Lakeville Highway and State Highway 37 in Southern Sonoma County, California,* The Bay Institute, Sonoma Land Trust, and Sonoma Ecology Center, July 2003.

23 *Light and Glare Policies – Report to GP 2020 Citizen's Advisory Committee*, Denise Peter, Sonoma County PRMD, August 15, 2002.

Although these policies and programs would reduce some of the impacts associated with light pollution, future lighting impacts would still occur, particularly from light sources associated with development that is not subject to discretionary review under the proposed lighting standards. Therefore, this would be a significant impact.

Mitigation Measure 4.11-3 No mitigation available beyond the *Draft GP 2020* policies discussed in the impact analysis above.

Significance After Mitigation This would be a significant unavoidable impact. (**SU**)

4.12 ENERGY

4.12 ENERGY

Energy – Environmental Setting

This section addresses the energy sources and amounts produced in Sonoma County, as well as the local efforts to use energy more efficiently and conserve energy. Renewable energy sources in the county include solar, waste-to-energy, wind, hydroelectric, and geothermal. Some of these sources are used by the private sector to produce localized power. Information on non-renewable energy sources is also presented, though these facilities are located outside of the county at present. Methods of energy conservation are presented in relation to land use patterns; transportation; building construction and retrofit; County facilities and programs; agriculture, industry and water / wastewater; and solid waste reduction, reuse, and recycling. County, State, and federal regulatory oversight is explained.

OVERVIEW

CEQA requires that EIRs discuss the potential energy impacts of projects, including avoiding or reducing inefficient, wasteful, and unnecessary consumption of energy. [1] Energy conservation and efficiency goals can be achieved by:

- Decreasing overall per capita consumption;
- Decreasing reliance on fossil fuels such as natural gas and oil; and
- Increasing reliance on renewable energy sources.

The production and use of energy is closely tied to development. Patterns of land use and types of transportation systems strongly influence the need for and use of energy. By adopting general and other land use plans that establish land use patterns and circulation systems, the County can influence the amount of energy that will be used at the local level. The County regulates smaller, often renewable sources of power and can promote local energy independence by eliminating regulatory barriers to these types of technologies. The County can adopt energy conservation and efficiency standards that reduce the demand for energy. [2]

County residential, commercial, industrial, and agricultural uses in the unincorporated and incorporated areas of the County consume about 2,601,179 MWh/y. [3] [4] The County produces some of

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1 *Guidelines for Implementation of the California Environmental Quality Act, Energy Conservation*, California Code of Regulations, Title 14, Division 6, Chapter 3, Appendix F.

2 *Draft General Plan Guidelines,* State of California Governor's Office of Planning and Research, 2002.

3 *MWh/y* means megawatt hours per year. A *megawatt* hour or *MWh* is 1,000 watt-hours, or 1 kilowatt-hour. A *watt*, *kilowatt*, and *megawatt* are measurements of power. A kilowatt-hour of energy is used if you turn on a 100-watt light bulb for ten hours.

its own power through the Central Landfill Power Plant (50,000 MWh/y), the hydroelectric facility at Warm Springs Dam (13,000 MWh/y), and a solar photovoltaic system on the roof of a County building (130 MWh/y).

The majority of the county's electricity is provided by Pacific Gas and Electric Company (PG&E). PG&E draws on a variety of energy sources to feed its regional power grids. The Geysers Geothermal Power Plants generate significant energy that supports the PG&E power supply. As a result, electricity sources in Sonoma County generate about twice as much electricity as is consumed in the county. However, since the county has no petroleum or natural gas production facilities, it is a net consumer of those energy sources.

It is useful to differentiate between energy efficiency and energy conservation. Energy efficiency means using less energy / electricity to perform the same function. Conservation connotes "doing without" in order to save energy rather than using less energy to do the same thing. For example, turning off lights, turning down the air conditioner, and making fewer vehicle trips are all conservation measures. Installing lighting that uses less electricity, installing additional insulation, and switching to a vehicle with better gas mileage are energy efficiency measures. [5]

ENERGY SUPPLY

California State Energy Sources

California's major sources of energy are petroleum (i.e., gasoline and oil), electricity, and natural gas. The California Energy Commission (CEC) indicates that California petroleum resources in 2001 came from in-state (49.4 percent), foreign sources (29.3 percent), and Alaska (21.3 percent). In 1999 natural gas resources in California came from the Southwest (46 percent), Canada (28 percent), in-state (16 percent), and the Rocky Mountains (ten percent). The gross electricity production by resource type in California in 2000 included natural gas at 38.10 percent, nuclear at 15.52 percent, and hydroelectric at 14.99 percent. Imports from the northwest and southwest added 6.69 percent and 2.85 percent, respectively, while geothermal was 4.8 percent, and biomass and waste accounted for 2.17 percent.

Sonoma County Energy Sources

A study of the consumption of petroleum, natural gas, and electricity in Sonoma County between 1983 and 1994 revealed that mainstream average energy uses in the county during this period were petroleum (54 percent), natural gas (28.5 percent), and electricity (17.5 percent). [6] Use of these energy forms in the county climbed moderately over the ten year period; mainstream energy use increased by 30 percent as the population increased by 31 percent. Total petroleum consumption increased by 25 percent while per capita consumption fell, in part reflecting increased fuel efficiency in motor vehicles. Total natural gas consumption increased by 32.6 percent while per capita consumption remained steady. Total electricity use increased by 47.6 percent, reflecting increased per

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4 *Resource Conservation Element – Energy Resources,* CAC memo, Lisa Posternak, Sonoma County PRMD, November 21, 2002.

5 *Draft General Plan Guidelines 2002,* Governor's Office of Planning and Research, State of California, 2002.

6 *Energy Use in Sonoma County, California,* Ilka M. Jerabek, Sonoma State University, 1996.

capita consumption. Sonoma County's main provider of electricity, PG&E, draws on a variety of state and local energy sources to feed its regional power grids, including geothermal, natural gas, hydroelectric, nuclear, oil, and coal.

The County General Services Department manages and maintains 1.5 million square feet of owned space and 350,000 square feet of leased space. The County-owned facilities use approximately 18.5 million kilowatt-hours per year (kWh/y) of electricity. Natural gas-fired boilers heat most complexes.

Constructed in 1993, expanded in 1996, and operated by the County Department of Transportation and Public Works, the power plant at the Central Landfill off Meacham Road generates six megawatts (MW) of electricity through combustion of methane gas from the landfill. The County uses a small fraction of the energy for on-site uses and sells the remainder to PG&E.

The Sonoma County Water Agency (Water Agency) uses large amounts of electricity, primarily to operate its water extraction pumps at its Wohler diversion facility along the Russian River; they use approximately 60,660 MWh of electricity annually. The Water Agency also operates a hydroelectric facility at Warm Springs Dam rated 2.6 MW. The annual electricity production of the facility is about 13,000 MWh. The Water Agency sells electricity from the hydroelectric facility to PG&E.

The use of fossil fuels such as gasoline, oil, natural gas, and coal generates emissions of greenhouse gases such as carbon dioxide, methane, oxides of nitrogen, and carbon monoxide that pollute and alter the composition of the atmosphere. This may contribute significantly to climate change (i.e., global warming). A 2002 study of the greenhouse gas emissions from Sonoma County governmental operations by Pacific Technology Associates revealed that the percent of greenhouse gas emissions are distributed as follows: building use (40.9 percent), employee commute (38.3 percent), fleet vehicles (20.3 percent), and water and sewer use (0.5 percent). Sonoma County has joined the Climate Protection Campaign sponsored by the International Conference on Local Environmental Initiatives (ICLEI) and will be setting targets for reducing these emissions, creating a plan for how to meet these targets, implementing the plan, and monitoring and adjusting as appropriate. [7]

Private Energy Generation Facilities

The main private energy generator in the county is the Geysers Geothermal Power Plants that total 1,122 MW and generate approximately five million MWh/y. Other private energy generation facilities at this time include small-scale solar photovoltaic (PV), hydroelectric, and wind systems used to generate power for some residences, agricultural operations, and commercial uses, particularly in the rural areas of the county.

ENERGY CONSERVATION AND EFFICIENCY

There are many opportunities for County government, residents, and businesses to use energy wisely through conservation and efficiency programs. These opportunities include:

- Land use – following compact development and land use patterns;

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7 Resource Conservation Element – Energy Resources, Lisa Posternak, Sonoma County PRMD, November 21, 2002.

- Transportation – decreasing reliance on cars and encouraging more walking, bicycling, and riding the bus;

- Building construction and retrofit – constructing more energy efficient homes and buildings;

- County facilities and operations – ensuring that County facilities and operations are as energy efficient as possible;

- Reduction of energy use in agricultural operations – continuing to take advantage of energy saving opportunities in agricultural operations;

- Reduction in solid waste – promoting solid waste reduction, recycling, and reuse programs; and

- Energy education.

Land Use

The existing *General Plan* Land Use Element contains goals and objectives that encourage city and community centered growth, compact city and community boundaries, and the phasing of rural and urban growth with the availability of adequate services. The county's number of small communities and history of rural residential development allows many current residents to live in rural areas, however, not necessarily in compact land use patterns.

Transportation

In California, 48 percent of all the energy used is for transportation; personal vehicles account for over 50 percent of all energy used in transportation statewide. The *Sonoma County Bikeways Plan* identifies goals, objectives, and policies for a county bikeways network, encouraging and facilitating commuting by bicycle, and increasing awareness of the benefits of bicycling and the rights and responsibilities of bicyclists.

Sonoma County Transit (SCT) celebrated 20 years of service in 2000. It provides intercity bus service in Sonoma County and local bus service in Rohnert Park, Cotati, Guerneville, Sebastopol, and Windsor. SCT operates nine local routes, three express routes, and ten intercity routes with a fleet of 58 buses, 40 of which are powered by natural gas from a natural gas fueling facility. In 2001 SCT provided bus service to 1.53 million riders.

Reducing fuel consumption by a government vehicle fleet will result in less air pollution and direct economic savings through decreased fuel purchases. Sonoma County Fleet Operations has four hybrid electric vehicles, three neighborhood electric vehicles, and compressed natural gas vehicles (currently not in operation) in its fleet.

Building Construction and Retrofit

Design and retrofit measures can make a building more energy efficient. The County Waste Management Agency has prepared *New Home Construction Green Building Guidelines* an educational guide for local builders, in addition to the Sonoma County Green Products Showcase. [8]

County Facilities and Programs

Government operations consume a large amount of energy. Government agencies tend to have long term occupancy, creating a positive opportunity for returns from long-term energy investments; and have the opportunity to set an example regarding the application of energy conservation and efficiency practices.

The County has contracted with Brown, Vance & Associates (BVA) to provide strategic planning and consulting to assist the County in a wide variety of energy related areas. The scope of work includes preparing a County Strategic Energy Plan for County operations that would contain an energy profile; energy goals and objectives; strategies for energy policies, energy projects, power contracts, inter-agency cooperation, formation of a municipal utility district, facility operations and maintenance changes, changes to design guidelines, and employee education; evaluation of these strategies; and a schedule for implementation. [9]

Sonoma County has several existing programs and projects related to energy conservation and efficiency: Under the *Sustainable Policies and Practices Project*, the County develops indicators to monitor energy use in County internal operations and implements energy conserving design guidelines for new County buildings. The County has goals to increase the use of renewable energy sources and increase recycling opportunities at the County Center Complex, and to certify Fleet Operations and Reprographics as *Sonoma Green Businesses.* The County has goals to decrease the use of City water by using campus on-site wells for irrigation.

Some of the specific projects include:

- An Energy Conservation Campaign that includes an Energy Conservation Employee Suggestion Award Program and an Energy website for County employees;
- Installation of a more energy efficient system for chilling water at the Central Mechanical Plant;
- Insulation of the roof of the existing Juvenile Hall and installation of R30 rated roofs in all new and retrofitted County buildings;
- Addition of electric and hybrid electric vehicles to the County's vehicle fleet; and
- Energy efficiency improvements at the Geyserville, Russian River, Airport-Larkfield-Wikiup, and Sonoma Valley wastewater treatment plants.

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8 *Sonoma Waste Management Agency*, Sonoma Waste Management Agency, [online] available http://www.recyclenow.org, August 2003.

9 Resource Conservation Element – Energy Resources, Lisa Posternak, Sonoma County PRMD, November 21, 2002.

Agriculture, Industry, Water Supply, and Wastewater Treatment

Agriculture, industry, and water supply and wastewater treatment operations consume approximately one-third of the electricity used in California. Energy represents the largest controllable cost of providing water or wastewater services to the public. Similar to other energy users, agriculture faces the challenge of enhancing productivity while sustaining its resource base and protecting the environment. In Sonoma County, agriculture is a key component of the economy and environment. Because energy costs affect profits directly, farmers are often highly aware of the energy costs associated with their operations in general and with individual pieces of machinery in particular. Public and private funding is available to leverage the costs of farm productivity improvements. [10]

Solid Waste Reduction, Reuse, and Recycling

Energy is used to manufacture the products that eventually become waste. Recovery of recyclable material from municipal solid waste can both save energy and extend the life of landfills. The Sonoma County Waste Management Agency is a joint powers authority of the nine cities and the County of Sonoma. The focus of the Agency's efforts is the implementation of regional waste diversion programs as required by State law. The Agency's responsibilities include administration of a regional composting program, household hazardous waste program, waste reduction education and information services, and business recycling programs. The *Countywide Integrated Waste Management Plan* includes the objective of achieving a 50 percent diversion of wastes being disposed of in county landfills by the year 2003, and a 70 percent diversion rate by 2015, based on 1990 rates. [11]

Energy Education

A 1988 California Energy Commission (CEC) study of the effectiveness of educational programs in conserving energy showed that information campaigns, audits of energy use or direct feedback on energy consumption, and financial incentives generate about 15 to 29 percent energy savings. The CEC offers cash rebates on eligible renewable energy electric-generating systems, including photovoltaics, small wind turbines, fuel cells, and solar thermal electricity systems. [12]

The Sonoma County Economic Development Board (EDB) has formed the Business Environmental Alliance (BEA), a public-private partnership working to promote the voluntary adoption of good environmental practices by local businesses and farms. A focus group of the BEA has looked at energy and water supplies in the County as well as opportunities for encouraging conservation measures. Their recommendations include educating Sonoma County business owners and their employees about the current energy and water supply situations and reducing their resource consumption, creating easily accessible information for businesses to learn more about conservation measures, and taking steps to streamline the process of participating in resource conservation programs.

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10 California Energy Commission, [online] http://www.energy.ca.gov/process/agriculture/, December 2002.

11 *Countywide Integrated Waste Management Plan,* Sonoma County Waste Management Agency, October, 2003.

12 *Renewable Energy Buydown Program,* California Energy Commission website, [online] http://www.consumerenergycenter.com/buydown/, December 2002.

The Sonoma County Department of Emergency Services administers the *Sonoma County Green Business Program*, which recognizes businesses that have taken steps to reduce their energy and water consumption. [13] The County's North County Detention Facility and heavy equipment Fleet Operations have been certified as *Sonoma Green Businesses*. The County is working to certify the County Administration Complex as a green business.

Sonoma County set a national precedent in August, 2002 when all of its cities and the County pledged to reduce greenhouse gas emissions. [14] Each jurisdiction will measure the amount of greenhouse gas it produces, set a target for reducing it, develop and implement a local action plan, and monitor its progress. Measurements reveal that the County's governmental operations now produce about 37,000 tons of greenhouse gas per year. The County has set a goal of reducing greenhouse gas emissions by 20 percent from 2000 to 2010. [15]

RENEWABLE ENERGY SOURCES

Solar Energy

Solar energy technology directly converts sunlight into usable energy, either electricity or direct heating of water or space. Photovoltaic (PV) solar facilities absorb sunlight and convert it directly to electricity through the reaction of electrons in PV cells. Solar PV and other passive solar systems are relatively small and extremely reliable and have a number of other desirable characteristics. Building and electrical permits are required to install such systems, and PRMD has established a procedure and required documents for processing permits for solar photovoltaic systems. [16] In 2002, a solar PV system was installed on the roof of the Sonoma County Information Systems Department building. The PV system produces about 130,000 kilowatt-hours per year (kWh/y).

Waste-to-Energy

Some waste materials can be used as a fuel in power plants to create electricity or other forms of energy. These power plants are defined by the type of fuel source they use: biomass, digester gas, industrial waste, landfill gas, and municipal solid waste.

Wood is a biomass source. In the more rural parts of the county that rely on propane as the primary heating fuel, individual homeowners often rely on wood burning stoves and fireplaces as a significant source of home heat. The EPA-certified wood stoves are cleaner burning, producing less air pollution. Refer to ***Section 4.3 Air Quality*** for discussion on the air quality issues related to wood burning.

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13 Nichols • Berman communication with Andy Parsons, Sonoma County Department of Emergency Services, May 2005.

14 *2002 A Year of Accomplishment for Community and Climate Protection,* Sonoma County Climate Protection Campaign, press release, accessed online at http://ci.santa-rosa.ca.us/City_Hall/City_Manager/CPC_121702-1.pdf, December 19, 2002.

15 *2002 A Year of Accomplishment for Community and Climate Protection,* Sonoma County Climate Protection Campaign, press release, accessed online at http://ci.santa-rosa.ca.us/City_Hall/City_Manager/CPC_121702-1.pdf, December 19, 2002.

16 Nichols • Berman communication with Cindy Rader, Sonoma County PRMD, May 2003.

The anaerobic digestion of municipal and household waste that occurs naturally in a landfill produces significant amounts of landfill gas that is composed of about 50 percent methane. Sonoma County has one landfill gas power plant- the Central Landfill Power Plant. Constructed in 1993, and expanded in 1996, the power plant at the County's Central Landfill generates 6,000 kW of electricity through the combustion of gas from the landfill. Garbage in the landfill decomposes through the activity of bacteria that release a gas that consists primarily of methane and carbon dioxide. The gas is collected through a series of wells hooked-up by pipelines that lead to a main pipeline that extends to a flare and the power plant, which consists of eight 800kW engine / generator sets. The electricity generated in the power plant is sent to transformers at the adjacent substation owned by the County, where it is converted to high voltage electricity and sold to PG&E. The County expanded the power plant to 7,500 kW in 2003 by adding two engine / generator sets. The County also plans to construct a landfill gas filtration system to remove contaminants and compress the remaining methane to become compressed natural gas (CNG), which would be used to fuel Sonoma County Transit buses.

Wind Energy

Wind power plants or farms are turbines which use the energy in the motion of the wind to make mechanical energy, which is then converted to electrical energy. In the year 2000, wind energy in California produced about 1.27 percent of the state's total electricity. Wind farms are generally located in areas with average annual wind speeds of at least 13 miles per hour. Sonoma County does not have any wind farms at this time.

Distributed wind systems, smaller wind turbines which provide on-site power in either a stand-along or grid-connected configuration, are another application of wind energy. Distributed wind systems can be used by industry, water districts, rural residences, agriculture, and other isolated uses located in windy areas, such as along the coast. Small-scale wind systems are used to generate power for some residences, agricultural operations, and commercial uses, particularly in the rural areas of the County. The County has adopted an ordinance to permit small wind energy systems.

Hydroelectric Energy

Hydroelectric power is a significant source of California's electricity. In 1999, hydroelectric power plants produced about 15 percent of the total electricity generated in California. Hydroelectric energy is generated by hydraulic turbines that rotate due to the force of moving water as it flows from a higher to a lower elevation. The water can be flowing in natural streams and rivers or contained in manmade facilities such as reservoirs, pipelines, and canals.

The Sonoma County Water Agency operates a hydroelectric facility at Warm Springs Dam rated at 2.6 MW. The annual electricity production of the facility is about 13,000 MWh. The agency sells electricity from the facility to PG&E.

Geothermal Energy

Geothermal energy is produced by the heat contained below the earth's crust. This heat is brought to the surface as steam or hot water created when water flows through heated, permeable rock. Added together, California's geothermal power plants produce about five percent of California's total electricity.

Geothermal resources in Sonoma County consist of steam, hot water, and heat concentrated below the earth's surface. The Geysers Geothermal Power Plants (The Geysers) in northeast Sonoma County is the most developed of the high-temperature geothermal resource areas in California and the location of

the world's largest steam-dominated geothermal power plant. The Geysers consists of 12 power plants, ranging from about ten to 122 MW, totaling 1,122 MW, and owned and operated by Calpine Corporation.

The Geysers currently generates about seven percent of the total electricity that PG&E supplies to California. The Geysers Recharge Project, completed in 2003, will transport about 11 million gallons per day of reclaimed water through a pipeline from the Laguna Wastewater Treatment Plant of the Santa Rosa Subregional Reclamation System to the Geysers steam field for the generation of electricity. The project would provide enough reclaimed water to generate about 745,000 MWh/y of electricity, about a 15 percent increase in the current Geysers electricity generation rate of about five million MWh/y.

Hot water resources may exist in other areas of the County, including Dry Creek Valley, Alexander Valley, and Sonoma Valley. Hot water resources can be used for space heating, food drying, aquaculture, greenhouses, and other uses that require heat.

NON-RENEWABLE ENERGY SOURCES

Thermal Power Plants

Thermal power plants convert fossil fuels (e.g., natural gas, petroleum, and coal) or nuclear fuels into electricity by burning the fuel (in most cases) to create heat which is then used to create steam, which in turn is used to turn a turbine that spins a generator that creates electricity. Natural gas and petroleum are also burned in gas turbine generators where the hot gases produced from combustion are used to turn the turbine. Sonoma County does not have any thermal power plants at this time.

Fuel Cells

Fuel cells operate much like a battery by transforming chemical energy into electrical energy directly without combustion. They require a continuous supply of hydrogen and oxygen, and produce direct current which must be passed through an inverter to create alternating current. Sonoma County does not have any public facilities that run on fuel cells. Information on the use of fuel cells by Sonoma County businesses is not available.

Oil and Gas Facilities

Sonoma County currently does not have any onshore or offshore fossil fuel (e.g., oil or gas) production facilities. A natural gas field with two wells between Sebastopol and Cotati was developed in the early 1980s and later shut down due to neighborhood complaints. The *Sonoma County Local Coastal Plan* (*LCP*), amended as of December 2001, addresses Outer Continental Shelf (OCS) oil and gas development in the Coastal Zone. The *LCP* does not contain land use recommendations that encourage industrial or energy development in the coastal area.

The *Offshore Oil Development: Onshore Support Facilities Feasibility Study* was completed in January 1991. One of the primary findings of the study is that no suitable sites exist in the Coastal Zone for industrial onshore oil and gas support facilities.

PRIVATE ENERGY FACILITIES

Small-scale solar photovoltaic (PV), hydroelectric, and wind systems are used to generate power for some residences, agricultural operations, and commercial uses in Sonoma County, reducing demand on the electricity grid. Solar electric installations provide a source of electricity for many private uses, and solar thermal installations provide electricity for active space and water heating at numerous businesses and residences throughout the county, particularly in rural areas. It is estimated that less than ten percent of the hydroelectric and about 50 percent of the wind systems are connected to the electricity grid. [17] Information on the number of small-scale, private power generation systems in the county is not available.

Energy – Regulatory Setting

COUNTY REGULATIONS

Sonoma County government's role in energy involves oversight of the County's own municipal energy expenditures and enforcement of the *Zoning Code*, which addresses the siting and operation of the types of energy facilities listed below. These facilities are permitted, permitted with a use permit, or not permitted in the various zoning districts:

- Facilities for the production or generation of electrical energy by a special district;
- Special district electrical substation facilities receiving less than one hundred thousand volts;
- Special district electrical transmission and distribution lines;
- Gas and electrical generation and transmission facilities, including necessary structures;
- Electrical substations receiving more than one hundred thousand volts;
- Transformer stations and small power stations;
- Development and use of natural resources with appurtenant structures;
- Exploration and development of geothermal resources;
- Exploration and development of low temperature geothermal resources for other than power development purposes;
- Geothermal energy wells, pipelines, and transmission facilities within the primary Known Geothermal Resource Area;
- Oil and gas wells;

[17] Nichols • Berman communication with Amy Lear, Sonoma County General Services Department, May 2003.

- Biomass energy projects; and

- Small wind energy systems.

The California Department of Conservation, Division of Oil, Gas, and Geothermal Resources, regulates the exploration and development of oil and gas resources. Under the Sonoma County Zoning Ordinance, the exploration and development of oil and gas wells are permitted with a Use Permit in the Resources and Rural Development (RRD) and Resources and Rural Development (Agricultural Preserve; RRDWA) Zoning Districts.

The Local Coastal Plan recommends the following relative to Outer Continental Shelf oil and gas exploration or development:

> *Require a Coastal Plan Amendment for any proposed onshore facility to support offshore oil and gas exploration or development. Any such amendment shall not be effective until a majority of the electors in Sonoma County, in a general or special election, approve the proposed amendment, unless such amendment is approved by the Commission pursuant to Section 30515 of the Coastal Act.*

The County has permitting authority over "decentralized generation" facilities, including small (i.e., less than 50 megawatt) thermal power plants, as well as non-thermal sources such as wind and solar energy. The County exerts regulatory control over the geothermal energy exploration, recovery, and power production at The Geysers.

STATE AND FEDERAL REGULATIONS

Siting Energy Facilities

The 1974 *Warren-Alquist Act* (Public Resources Code Section 25000 et seq.) created the State Energy Resources Conservation and Development Commission, more commonly known as the California Energy Commission (CEC). The CEC has five major areas of responsibility: forecasting future electricity and energy needs, licensing energy facilities to meet those needs, promoting energy efficiency, developing renewable energy sources and alternative energy generating technologies, and planning for and directing state response to energy emergencies.

In terms of electrical generating facilities, there are two project types that trigger preemption of local authority regardless of the project applicant. First, non-federal hydroelectric facilities (i.e., those not built by the federal government) are normally under the licensing authority of the Federal Energy Regulatory Commission (FERC). Exemptions from FERC's license are granted only if a project meets specific criteria. Second, thermal power plants rated 50 megawatts (MW) or greater are normally under the authority of the CEC pursuant to the *Warren-Alquist Act*. Nuclear thermal power plants are under the authority of the U.S. Nuclear Regulatory Commission (NRC). A thermal power plant is any stationary or floating electrical generating facility using any source of thermal energy, such as oil, coal, natural gas, nuclear, and solar thermal power plants. It does not include wind, hydroelectric, or solar photovoltaic power plants. However, the statute which created the CEC's jurisdiction also directs the CEC to consider whether a proposed project will conform to local laws, ordinances, regulations, and standards.

Electricity Generation and Transmission- Deregulation

A significant shift in the U.S. regulatory system began with the Energy Policy Act of 1992, which required interstate transmission line owners to allow all electrical generators to access their lines. Today many states are at various stages of electric utility deregulation.

Utility deregulation is one of the many reasons for the high level of interest in distributed energy resources (DER), small-scale power generation technologies (i.e., typically in the range of three to 10,000 kW) located close to where the electricity is used (e.g., a home, business, or government facility). The purpose is to provide an alternative to or an enhancement of the traditional electrical power system. Under the DER scenario, a variety of energy facilities and sources are used rather than relying on one energy technology. Related factors that have led to a growing national interest in on-site power generation include: inadequacy of the existing electrical power infrastructure to keep pace with soaring demand for high-quality, reliable power; reduced investment in large electrical generating plants; reduced incentives for utilities to invest in new generating facilities; and technological advancements in small-scale power generating equipment with greater efficiencies, environmental advantages, and lower costs. These facilities are referred to as *distributed generation* (DG).

The CEC's June 2002 *Distributed Generation Strategic Plan* emphasizes the role of local government in distributed generation:

- The role of local governments is critical to the future of DG in California. Permitting of DG is most likely to be performed by local governments. As such, local governments will need access to information that will assist them in making these permitting decisions.

- Local government facilities offer ideal settings for demonstrating DG technology, because public institutions can tolerate longer payback periods than private businesses, and their demonstration sites are visible to local residents and businesses.

- Local governments have land-use authority that can be used to express preferences toward local, small-scale electric generators for meeting their future energy needs.

Energy – Significance Criteria

This energy analysis uses criteria developed from the *State CEQA Guidelines, Appendix F*. According to these criteria, the project would have a significant energy resources impact if it would result in:

- Land use locations and patterns causing wasteful, inefficient, and unnecessary consumption of energy;

- The construction of new or retrofitted buildings that would have excessive energy requirements for daily operation; and

- Increased energy demand and the need for additional energy resources.

Energy – Impacts and Mitigation Measures

Impact 4.12-1 Energy Consumption from Land Use Locations and Patterns
*The Draft GP 2020 land use plan could affect energy usage by creating a land use pattern that could increase the dependence on single occupancy vehicles. The proposed land use pattern would be compact and focus future development within or adjacent to existing developed areas. Agricultural production and related uses would continue to be located in agricultural areas. This land use pattern would reduce the future reliance upon single occupancy vehicles, a major user of energy. As a result, this would be a less-than-significant impact. (**LTS**)*

Land use patterns can significantly affect energy consumption in either a positive or negative manner. For example, compact and multi-use development can greatly reduce transportation energy demands by allowing residential development in proximity to shop and work centers.

The land use patterns proposed in the *Draft GP 2020* would not be substantially different than those in the existing *General Plan.* While the historic land use pattern has resulted in scattered communities, the land use map would continue to focus most residential and commercial development within existing developed communities and limit future growth in rural areas except where needed to support agricultural production. By encouraging denser residential, commercial, and industrial development within urban areas the concentration of population, employment, and services allows for less frequent use of and reliance upon single-occupancy vehicles as a primary mode of transportation. Because automobile travel is a major user of energy, a reduction in reliance upon such travel would result in reduced levels of energy consumption.

While overall energy consumption would continue to increase as growth occurs, the *Draft GP 2020* would reduce the reliance upon single-occupancy vehicles by encouraging the establishment of alternative modes of transportation. For example, Policy **CT-4a** would implement commuter rail service between Cloverdale and Marin County by developing the Sonoma Marin Area Rail Transit (SMART) project. Policy **CT-1d** would call for cooperation with cities to provide jobs, housing, and shopping along the SMART corridor in order to reduce the need for automobile travel. Policies **CT-2a** through **CT-2aa** would increase the opportunities for use of transit systems, as well as other alternative modes to the single occupancy vehicle.

Goal **LU-2** would direct the County to accommodate the majority of future growth within the existing cities and their urban growth areas. Objective **LU-1.2** would encourage compact development by focusing the majority of commercial and industrial growth in the cities. Objective **LU-2.2** and **2.3** would direct most of the future population growth in unincorporated areas to occur in communities with adequate public services, thereby reducing energy demands for extended services. Objective **LU-2.5** would encourage higher density housing as well as the development of affordable housing units within Urban Service Areas and thereby support compact development patterns. Policies **LU-2a** through **LU-2d** would support Objectives **LU-2.2**, **2.3**, and **2.5** by managing residential holding capacity, continuously evaluating proposed projects in unincorporated areas for consistency with these goals, objectives, and policies, and providing for affordable housing opportunities in existing communities.

Goal **LU-3** and its supporting objectives and policies would further support compact city and community development. To reach this goal, these policies would rely on expansion area boundaries, cooperation with the Local Agency Formation Commission (LAFCO), limit service expansions outside of existing urban service areas, and maintain lower density areas outside of urban service boundaries.

Policy **OSRC-14c** would encourage County operations as well as residents and businesses to use alternative fuel vehicles.

The above goals, objectives, and policies would assure that implementation of the *Draft GP 2020* would not result in increased energy demands due to wasteful land use planning. This would be a less-than-significant impact.

Mitigation Measure 4.12-1 None required.

Impact 4.12-2 Energy Consumption from Building Construction and Retrofit

Land uses and development consistent with the Draft GP 2020 could result in inefficient and excessive use of energy resources. However, the Draft GP 2020 includes goals, objectives, and policies that would support energy efficiency in new construction and retrofit. As a result, this would be a less-than-significant impact. ***(LTS)***

Building design and retrofit measures can make a building more energy efficient. Because the design and retrofit of commercial and industrial buildings is different than that of residential buildings, there is a greater potential for energy savings in commercial and industrial facilities. This is particularly true due to the large amounts of energy that commercial and industrial facilities typically use for the manufacturing process, space heating and cooling, refrigeration, and lighting. Furthermore, because commercial and industrial buildings are typically much larger than residential structures, there are more opportunities for the reduction of energy demands.

Passive heating, cooling, and lighting techniques can be used to not only reduce energy demands, but also significantly reduce operating costs. Techniques include high levels of insulation, interior massing, careful placement of windows, skylights, and doors, natural ventilation, deliberate design of lighting, use of energy efficient appliances, windows, and doors, and appropriate landscaping. While new construction provides the simplest opportunity for implementation of such techniques, older buildings can also benefit from retrofitting for energy efficiency that includes passive heating, cooling, or lighting. New construction also provides the opportunity for optimal solar access through building siting and orientation, and thus further reduces energy demands for heating and cooling.

Existing codes as well as several objectives and policies in the *Draft GP 2020* would support energy efficiency in new and retrofit construction. Policies **OSRC-14b** and **OSRC-14c** would support energy efficiency in County operations and facilities by continuing the efforts underway in building retrofit and alternative fuel vehicle use. Policy **OSRC-14d** would reduce energy use in new construction by encouraging new projects to exceed the Energy Efficiency Standards of Title 24 of the California Building Code. Policy **OSRC-14e** would further reduce energy use in new construction by incorporating energy conservation and efficiency requirements into design guidelines for new development.

Although energy usage would continue to increase overall, these policies would reduce the level of energy consumption related to future building construction and retrofit. Therefore, this would be a less-than-significant impact.

Mitigation Measure 4.12-2 None required.

Impact 4.12-3 Increased Energy Demand and Need for Additional Energy Resources
Future land uses and transportation systems could substantially increase the demand for energy resources and the need for additional energy resources to meet this demand. This would be a significant impact. ***(S)***

Increased demand for energy is a byproduct of all future land uses and development consistent with the *Draft GP 2020*. As growth in the county increases, energy demand would also increase. Energy is consumed for heating and electricity in homes and businesses, for public infrastructure and service operations, and for agriculture, resource extraction, and rural uses. However, the primary user of energy resources is the motor vehicle.

Future growth in Sonoma County would be focused in the cities and unincorporated communities. Although effort is being made to increase modes of travel that would not be as dependent upon the automobile, energy consumption for vehicle travel will continue to rise.

This increased usage of energy will require additional sources of energy to supply the demand. These sources will likely continue to be the same sources that supply energy needs today. The Geysers Steamfield, energy production at the Central Landfill, and the Warm Springs Dam are local sources. Statewide energy demand will continue to be supplied by a combination of fossil fuels, hydroelectric, wind, cogeneration, and other sources. In the near future, the primary energy resource will continue to be oil and gas that is either produced domestically or imported from oil-producing countries worldwide.

The *Draft GP 2020* contains goals, objectives, and policies that address this increased demand in several ways. First, the Circulation and Transportation Element contains goals, objectives and policies (e.g., Goal **CT-2**, Policies **CT-2a** through **CT-2aa,** Goal **CT-4,** Policies **CT-4a** through **CT-4c)** which would contribute to reduction in fuel consumption by promoting and supporting opportunities for non-automobile travel and reduction in automobile use.

In addition, Goal **OSRC-15** and Objectives **OSRC-15.2** and **OSRC-15.5** would support the development of renewable energy sources and decentralized power generation. For example, the Geysers Geothermal Steamfield, augmented by re-used water from the regional wastewater system would be expected to continue to generate electricity. In addition, Policies **OSRC-15b** and **OSRC-15c** would promote the use of distributed energy systems, such as solar power and water heating or small wind energy systems, in County facilities and integrated into existing and new development. Policy **OSRC-15d** would add energy facility siting policies to the Sonoma County Integrated Development Code to allow for small-scale renewable energy generating systems could be sited close to energy users in all zoning districts. Policy **OSRC-15h** would also allow the use of hot water geothermal resources for energy generation in all land use districts.

Finally, the *Draft GP 2020* promotes energy education programs that would assist in reducing the demand for energy resources. Energy conservation and efficiency measures sometimes do not work simply because people either do not know about them or are not aware of their potential to save energy. As a result, education is a key tool in changing our behaviors and values relative to energy. Policy **OSRC-14a** would encourage energy conservation and efficiency through education. This policy would continue support for existing education programs that reduce waste, promote energy conservation, and encourage recycling programs for county residents, businesses, and County operations.

Sonoma County currently has a number of programs and projects that will continue to reduce future energy demand and increase efficiency. These are discussed in the environmental setting.

These policies and programs would contribute to reducing the increase in energy demand as well as promoting opportunities for increased production in ways that may be sustainable. However, because energy usage and demand would continue to increase as a consequence of future growth, however efficient, and because automobile travel would continue for some time to be the travel mode of choice, this would remain a significant impact.

Mitigation Measure 4.12-3 No mitigation available beyond *Draft GP 2020* policies discussed in the impact analysis above.

Significance After Mitigation This would remain a significant unavoidable impact. (**SU**)

4.13 HAZARDOUS MATERIALS

4.13 HAZARDOUS MATERIALS

Hazardous Materials – Environmental Setting

This section describes the county's hazardous waste generation sites; treatment, storage, and disposal facilities; transportation routes; and contaminated sites. Hazardous waste sources include gasoline and other leaking tanks, accidental spills, and some common agricultural, commercial, industrial, and household chemicals. The County's emergency response capability and educational efforts are outlined. Efforts by the County and others to reduce the use of hazardous materials are described.

The Sonoma County Department of Emergency Services (DES) defines a hazardous material as a:

> *Substance or combination of substances which because of quantity, concentration, physical, chemical, radiological, explosive, or infectious characteristics, poses a potential danger to humans or their environment. Generally such materials are classed as explosives and blasting agents, flammable and nonflammable gasses, combustible liquids and solids, oxidizers, poisons, disease-causing agents, radioactive materials, corrosive materials and other materials including hazardous wastes.*

Hazardous materials are used throughout Sonoma County in various agricultural, industrial, commercial, medical, research, and household settings. Numerous federal and State laws, as well as local policies and plans, control the production, transportation, storage, and use of these hazardous materials and their waste products.

HAZARDOUS WASTE GENERATING SITES

Numerous hazardous materials are found in Sonoma County. Business and industry generators include the automotive and transportation industries, which store and use petroleum fuels and use chlorinated solvents and paints for repairs; manufacturing industries that use solvents, paints, metals, compressed gases, and cleaning agents; and the agricultural industry, which uses pesticides, fungicides, herbicides, and fertilizers. In 2000, Sonoma County uses generated 13,434 tons of hazardous waste, not counting waste oil. The number of large and small generators increased over the past decade from 31 large and 240 small generators in 1991, to 69 large and 862 small generators in 2000. [1]

The Geysers produce a significant amount of electricity from the Geysers Known Geothermal Resource Area and, in turn, generates hazardous wastes. The main wastes generated are ammonia in the steam condensate and small quantities of heavy metals in the waste sludge. In the air stream, hydrogen sulfide gas is the primary waste of regulatory concern.

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1 *Hazardous Waste/Tanner Planning Report, 2000 San Francisco Bay Area Waste Generators and Treatment Facilities* Association of Bay Area Governments, September, 2001.

Hazardous waste sites include businesses that store, generate, or dispose of hazardous waste. Such businesses are required to prepare and submit a Hazardous Materials Business Plan to the County. Approximately 1,000 businesses participate in this or related programs designed to regulate the ongoing business and industrial use of hazardous materials in the county.

The primary hazardous waste site is the County's Household Toxic Waste Facility that is expected to open in 2005 at the Central Disposal Site located between Cotati and Petaluma. Residents will be able to drop off household toxics for free, while qualifying small businesses will be charged disposal fees based on the type and quantity of hazardous material. There are limitations on the amount of waste that can be legally transported to the facility. [2]

TREATMENT, STORAGE, AND DISPOSAL FACILITIES (TSDFS)

Treatment, Storage, and Disposal Facilities (TSDFs) collect, store, recycle, and treat hazardous wastes from industrial and commercial sites. Also, numerous industrial and commercial facilities are required to treat and temporarily store their own hazardous materials and waste. Hazardous materials and waste are also collected at periodic mobile "drop-off" events held in various parts of the county throughout the year, which provide a heavily used opportunity for households to conveniently dispose of leftover paints, oils, and other wastes. Hazardous waste haulers transport all hazardous waste, both one-time and recurring, to TSDFs outside of the county. [3] Since there are no TSDFs within Sonoma County, the county had a net capacity deficit of 13,434 tons in 2000, according to the region wide Capacity Allocation Formula. This is not considered a problem, as outside county TSDFs are not at capacity. [4]

TRANSPORTATION ROUTES

Hazardous wastes are transported through the county by truck, primarily along the major arterials and highways, for disposal at TSDFs in other counties or outside of California. **Exhibit 4.13-1** shows the several hazardous waste haulers located within the county that collect different types of waste from local generators; other haulers from outside the county may also provide local service. County roads and city streets may be used to transport hazardous wastes from their sources to major highways. Haulers are required to use the most direct, safe route. Aside from low level nuclear sources used in some detection devices, no nuclear material of substance is transported through Sonoma County. [5]

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2 Hazardous Materials Division, Sonoma County Department of Emergency Services, [online] http://www.sonoma-county.org/esservice/hazard.htm, February 2003.

3 For a current list of TSDFs, refer to the *California Commercial Offsite Hazardous Waste Management Facilities* list, Department of Toxic Substance Control, Hazardous Waste Management Program, [online] http://www.dtsc.ca.gov/HazardousWaste/index.html, October, 2003.

4 *Hazardous Waste/Tanner Planning Report, 2000 San Francisco Bay Area Waste Generators and Treatment Facilities, pg 7,* Association of Bay Area Governments, September, 2001.

5 Nichols • Berman communication with Lisa Posternak, Sonoma County PRMD, July 2003.

Safety-Kleen, an industrial waste management company, operates a hazardous materials transfer station in Rohnert Park. The total amount of hazardous materials stored at any given time is 2,000 gallons. These materials are shipped to the company's facility in Reedley, California, for treatment. The primary hazardous materials include mineral spirit solvent, perk (a cleaning solvent used in the dry cleaning business), and lacquer thinner. These materials are obtained from an area extending from San Francisco to Eureka. [6]

Exhibit 4.13-1
Sonoma County Hazardous Waste Haulers

Hauler	*Location*	*Hazardous Waste*	*Motor Oil / Antifreeze*	*Contaminated Soil*	*Paint*	*Fluorescent Lamps*
Safety Kleen	Rohnert Park	Yes	Yes	Yes	Yes	Yes
SR Chain Environmental	Healdsburg	Yes	Yes	Yes	Yes	No
Don Beste	Windsor	Yes	No	Yes	No	No
Fuel Oil Polishing Program	Rohnert Park	No	No	Yes	No	No
Sunshine West Lighting	Santa Rosa	No	No	No	No	Yes
Eco-Tech Systems	Sonoma	No	Yes	No	No	No

Source: Nichols • Berman and the Integrated Waste Division, Department of Public Works and Transportation, and County of Sonoma.

CONTAMINATED SITES AND BROWNFIELDS

Brownfields are properties that lie fallow due to actual or suspected contamination but have a potential for redevelopment or reuse. Former auto-wrecking yards, gas stations, computer-electronics industry sites with chlorinated solvent discharges, and lumber mills are examples of brownfields found in Sonoma County. Redevelopment of brownfield properties can be a cost effective alternative for land to meet local development needs. Brownfield projects result in environmental remediation of the land to make it suitable for development.

Within the North Coast Regional Water Quality Control Board (Region 1) jurisdiction, there are 1,140 sites which have been contaminated with hazardous waste. Of these, 520 sites have been remediated and are considered closed. The remaining 620 sites are considered open (i.e., still active) and in need

6 *Revised Draft EIR for the Rohnert Park General Plan,* City of Rohnert Park, 2000.

of remediation. [7] Within the Bay Area Water Quality Control Board's district (Region 2) there are 26 sites which have been contaminated with hazardous waste. [8] [9] Of these, 13 sites have been remediated. The remaining 13 sites are still active and in need of remediation. [10]

UNDERGROUND STORAGE TANKS AND OTHER HAZARDOUS SPILLS

Underground storage tanks (USTs) are common throughout Sonoma County. They are most often used for the storage of gasoline and diesel fuels, while also used for the storage of new and used motor oil, solvents, chemicals, etc. Leaking underground fuel tanks (LUFTs), mainly those containing petroleum, are the leading cause of soil and groundwater contamination in the county. LUFTs occur in the urbanized areas of the county, along the Highway 101 corridor and other county highways. [11] In one study, *Methyl tertiary-butyl ether* (MTBE), a gasoline additive, has been found in 78 percent of the groundwater monitoring wells examined statewide, including wells located in the Sebastopol area. MTBE is considered a possible human carcinogen by the U.S. Environmental Protection Agency. MTBE is a frequent and widespread contaminant in shallow groundwater throughout California. The potential long-term accumulation resulting from the dispersion of MTBE plumes may be a key consideration for management of specific regional groundwater basins. Preventing leaks is a critical requirement for protecting drinking water resources. [12]

It is difficult to pinpoint the exact number of LUFT sites at any one point in time. The number of MBTE cases is increasing as some older closed petroleum hydrocarbon sites are re-examined and re-opened for investigation. [13]

The RWQCBs investigate and coordinate the clean up of other types of hazardous spills through the program *Spills, Leaks, Investigations, and Cleanups* (SLIC), in conjunction with the County Environmental Health Department. The SLIC program is designed to clean up the impacts of current

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7 A *closed* site is a site on which hazardous waste remediation has already occurred. An *open* site is one on which the remediation is not yet complete or has not started.

8 As discussed in ***Section 4.5 Hydrology and Water Quality*** there are two RWQCB districts in Sonoma County.

9 Nichols • Berman communication with Chuck Headlee, Bay Area Regional Water Quality Control Board, February, 2005.

10 Nichols • Berman communication with Chuck Headlee, Bay Area Regional Water Quality Control Board, February, 2005.

11 GeoTracker database, State Water Resources Control Board, accessed online at http://www.geotracker.swrcb.ca.gov/about.htm, October 2003.

12 *An Evaluation of MTBE Impacts to California Groundwater Resources*, A. M. Happel, E. H. Beckenbach, and R. U. Halden, Lawrence Livermore National Laboratory, 1998.

13 Since the number of active cases is increasing, please refer to the State Geo Tracker database system for the present status and approximate locations of LUST sites. This can be accessed on the internet at http://geotracker.swrcb.ca.gov.

or historic unauthorized discharges to groundwater, but in some cases also to surface waters or sediments. [14]

COMMERCIALLY APPLIED CHEMICALS

Pesticides, herbicides, insecticides, fungicides, etc are applied for both commercial and household purposes. Pesticides that are applied commercially are regulated and monitored by the State Department of Pesticide Regulation. The Agricultural Commissioner monitors commercial applications of agricultural pesticides, a major component of commercially applied chemicals in Sonoma County. The use of pesticides in households is regulated by the instructions on the container and is not independently monitored. As a result, the extent of household applied chemicals is not known.

From 1991-95, California pesticide use increased, as did the acreage of planted land. Six pesticides accounted for 73 percent of the increase, with most of the increased use on a handful of crops. One pesticide that increased in use, sulfur, is considered to be naturally occurring and is used as part of *Integrated Pest Management* (IPM). Soil fumigants such as methyl bromide and metam-sodium are regarded among the most toxic and probable carcinogens; their application has increased statewide with the addition of newly-planted areas, including wine grapes. The State Department of Pesticide Regulation (DPR) states that there currently are few economically feasible, non-pesticide alternatives for most of the pest problems for which these particular pesticides are used. Furthermore, many pests have developed resistance to pesticides that were previously effective. In conclusion, DPR states that burgeoning pest problems and a shortage of alternatives, chemical and non-chemical, sometimes present farmers with situations where they see no choice but to increase their use of pesticides. [15]

Sonoma County ranked 18th out of the 58 California counties in total pounds of commercial [16] pesticide active ingredients as reported to the State in 2000 and 2001. [17] In 2000, the Sonoma County wine grape commodity accounted for 2,904,922 pounds, or 94 percent of gross pounds commercial chemicals applied, compared to the total Sonoma County commercial chemical use, including all other types of agriculture, landscape maintenance, right-of-way, and structural pest control in the county. In 2001, that total amount applied to vineyards was 2,451,380 pounds, or 96 percent of the county's total commercial chemical use. [18]

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14 Regional Water Quality Control Board, San Francisco Region 2, accessed online at http://www.swrcb.ca.gov, August 2003.

15 *An Analysis of Pesticide Use in California, 1991 -1995,* Larry Wilhoit, David Supkoff, John Steggall, Adolf Braun, Charlie Goodman, Bob Hobza, Barbara Todd, and Marshall Lee, California Department of Pesticide Regulation, Environmental Monitoring and Pest Management Branch and California Department of Food and Agriculture, Office of PesticideConsultation and Analysis, 1998.

16 This discussion does not include household pesticides used, only commercially applied pesticides.

17 State Department of Pesticide Regulation data.

18 *PAN Pesticide Database,* Pesticide Action Network North America, [online] http://www.pesticideinfo.org, August 2003.

Exhibit 4.13-2 presents a summary of the grape pesticide use in Sonoma County from 1990 through 2001. It shows that the gross total pounds applied peaked in 1994, at 4,162,821; with each subsequent year a reduced amount of chemicals were applied. This occurred even though the acreage planted in vineyards has increased. Each separate category of pesticide also peaked in that year. Sulfur has decreased the least, as it is used more as part of IPM efforts. The carcinogen methy bromide applications have decreased the most, from 632,000 pounds in 1994 to 31,650 pounds in 2001. The third category of chemicals, called non-sulfur, has decreased in the same time period from 882,721 pounds approximately by 50 percent to 438,580 pounds. The Sonoma County Grape Growers Association (SCGGA) has been implementing a program to promote the use of IPM to monitor vineyard pests and disease and use lower risk pest management practices. The goal is to reduce the use of certain insecticides, fungicides, herbicides, and miticides targeted by the federal Food Quality Protection Act (FQPA). **Exhibit 4.13-3** shows a decline in the usage of some FQPA targeted chemicals in Sonoma County grape production from 1999 to 2000. The SCGGA IPM project is continuing. [19]

Exhibit 4.13-2
Summary of Grape Pesticide Use in Sonoma County

Year	*Total Applied (Lbs)*	*Sulfur (Lbs)*	*Methyl Bromide (Lbs)*	*Non-Sulfur (Lbs)*	*Acres*	*Percent Sulfur*
1991	1,750,215	1,573,600	---	176,615	*34,000*	*89.9*
1992	2,032,400	1,523,600	---	508,800	*34,500*	*75.0*
1993	3,059,291	2,492,000	225,700	567,291	*35,000*	*81.5*
1994	4,162,821	3,280,100	632,000	882,721	*35,700*	*78.8*
1995	3,747,800	2,997,400	454,900	750,400	*36,330*	*80.0*
1996	3,355,000	2,705,200	428,300	649,800	*38,399*	*80.6*
1997	3,614,800	2,904,200	461,240	710,600	*40,001*	*80.3*
1998	3,512,900	3,031,300	193,700	481,600	*44,681*	*86.3*
1999	3,275,500	2,541,200	449,900	734,300	*51,465*	*77.6*
2000	2,904,900	2,321,500	132,159	583,400	*55,877*	*79.9*
2001	2,451,380	2,012,890	31,650	438,580	*58,667*	*82.1*

Source: Sonoma County Grape Growers Association

19 Nichols • Berman communication Nicholas Frey, Executive Director, Sonoma County Grape Growers Association, July, 2003; and *Pest Management Grants Final Report – Promotion of Vineyard Pest and Disease Monitoring and Reduced-Risk Pest Management Practices in Sonoma County,* Nicholas M. Frey, Sonoma County Grape Growers Association, California Department of Pesticide Regulation, February 27, 2002.

Exhibit 4.13-3
Food Quality Protection Act – Targeted Pesticide Usage in Sonoma County Grape Production

Pesticide	*FQPA Class*	*Pounds Used 1999*	*Acres Treated 1999*	*Pounds Used 2000*	*Acres Treated 2000*
Insecticides					
Dimethoate	Organophosphate	969	3,021	361	1,997
Diazinon	Organophosphate	635	1,143	55	143
Fenamiphos	Organophosphate	5,214	2,331	4,230	1,364
Carbaryl	Carbamate	897	504	613	584
Fungicides					
Mancozeb	Carcinogen	31,555	23,240	33,000	21,431
Iprodione	Carcinogen	4,024	4,923	1,499	1,892
Herbicides					
Simazine	Carcinogen	24,177	10,832	21,064	13,064
Oxyflurofen	Carcinogen	14,455	19,857	17,664	24,940
Miticide					
Propargite	Carcinogen	5,055	3,478	1,503	1,091
Totals		**86,981**	**69,329**	**79,989**	**66,506**

Source: Sonoma County Grape Growers Association; *Pesticide Use Reports,* State Department of Pesticide Regulation; and Federal Food Quality Protection Act (FQPA).

HOUSEHOLD HAZARDOUS MATERIALS

There are no data available to show how many county households contribute to pesticide pollution through the use of home landscaping products and other home activities and chemicals. There are a number of common household toxics found in the garage (antifreeze, motor oil, gasoline, waxes, auto batteries, brake fluid); in the workshop (paint, paint thinner, wood preservatives, glues, solvents, photo chemicals); in the house (ammonia and bleach cleaners, polishes, medications, syringes, batteries); and in the yard (pesticides, fungicides, weed killers, pool chemicals, pool backwash). Household hazardous materials also include an increasing amount of electronic waste, including computers and cell phones. Improper disposal of these wastes can result in potential toxic leachate at sanitary landfills, in storm drains, and in creeks and rivers. The Household Toxics Waste Facility at the County's Central Disposal Site is expected to open in 2005. The County has relied on Household Toxics Roundups and curbside oil pickups, among other programs, to keep toxics out of the regular landfill.

There is little known about how much household hazardous waste is generated annually. The County has estimated that, in 1990, 1,095 tons of household hazardous waste was disposed of, while in 1996, the amount was 1,797 tons. Over the five year period from 1998 to 2003, 91 percent of county households did not participate in the hazardous waste program. At the same time, the amount of household hazardous waste collected increased from 1,192, 578 pounds collected in 1998, to

2,260,660 pounds in 2003. A large number of new chemicals enter the waste stream, with no synergistic testing to indicate how chemicals react together. More materials not previously considered hazardous waste are now so characterized. The County is developing the infrastructure to allow the proper disposal of hazardous waste, though its effectiveness is not assured. [20]

HAZARDOUS MATERIALS EMERGENCY RESPONSE

Hazardous materials emergency response is the responsibility of Sonoma County Department of Emergency Services (DES), Hazardous Materials Division. The Sonoma County Hazardous Materials Response Team, formed in 1994, is both paid and volunteer. This team is trained to respond to any level of hazardous materials incident in the county, including overturned tank trucks, fires involving hazardous materials and chemicals, incidents involving radioactive materials, downed electrical lines and ruptured natural gas lines, chlorine and toxic gas releases, fuel spills, and explosives and bombs. The DES Hazardous Materials Response Team maintains a response vehicle and trailer; both equipped with specialized equipment.

The County DES Hazardous Materials Division responds to hazardous materials incidents throughout the county and maintains contracts with some of the cities for hazardous materials releases within those cities. They maintain lists of large quantity hazardous waste generators (i.e., those that generate more than five tons per year.) There are two other hazardous emergency teams in the county: the City of Santa Rosa Fire Department and the City of Rohnert Park Department of Public Safety. The three teams in the county will respond to assist each other under the County's Mutual Aid agreement. The County DES coordinates with each of these city response teams when purchasing specialized equipment, upgrading equipment, and training. The County DES Hazardous Materials Division also maintains a contract with the Valley of the Moon Fire Protection District for decontamination services.

Hazardous Materials – Regulatory Setting

Hazardous materials are subject to numerous laws and regulations at all levels of government. Most hazardous materials regulation and enforcement in Sonoma County is managed by DES, as well as the Environmental Health Division of the County Department of Health. However, large cases of hazardous materials contamination or violations in Sonoma County are handled by the two California Regional Water Quality Control Boards (RWQCBs) and the California Department of Toxic Substances Control (DTSC). [21]

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[20] Nichols • Berman communication with Lesli Daniel, Household Hazardous Waste Program Manager, Sonoma County Waste Management Agency, November, 2003; and *Countywide Integrated Waste Management Plan*, Sonoma County Waste Management Agency, October, 2003.

[21] As with most regulations but especially true with hazardous materials the regulations are not easily distinguished as local, State or federal since various agencies will implement other agencies policies.

COUNTY REGULATIONS

Certified Uniform Program Agencies (CUPA)

The Unified Hazardous Waste and Hazardous Management Regulatory Program (SB 1082, 1993) is a State and local efforts to consolidate, coordinate, and make consistent existing programs regulating hazardous waste and hazardous materials management. Cal EPA adopted implementing regulations for the Unified Program [22] in January 1996. The Unified Program is implemented at the local level by Certified Unified Program Agencies (CUPAs).

The Hazardous Materials Division of the DES is the CUPA for cities and unincorporated areas within Sonoma County. Through the division, the County regulates the use, storage, and disposal of commercial hazardous materials by issuing permits, inspecting facilities, and investigating complaints. The County issues permits for the installation and removal of underground storage tanks. It inspects businesses for compliance with the Hazardous Waste Control Act and also requires that businesses that handle hazardous materials and hazardous wastes submit a Hazardous Materials Business Plan (HMBP). The HMBP includes an inventory of hazardous materials and hazardous wastes, as well as a prepared emergency response to incidents involving applicable hazardous materials and wastes.

The County, along with the cities of Santa Rosa, Sebastopol, Petaluma, and Healdsburg, and the North Coast RWQCB and the San Francisco Bay RWQCB maintain files on existing dry cleaners and known dry cleaner sites where there are confirmed or suspected solvent discharges. If groundwater is impacted, the lead regulatory agency is the State of California through the local RWQCB. In this capacity, the RWQCBs are responsible for investigating and remediating the contaminated sites. The County Department of Health Services, Environmental Health Division, and DES are kept informed of actions and progress but otherwise are not involved. The cities of Santa Rosa, Sebastopol, Petaluma, and Healdsburg maintain this oversight responsibility within their jurisdictions under the CUPA requirements.

For the county unincorporated areas, the DES is the CUPA, except the Environmental Health Division implements the Local Oversight Program (LOP). The LOP oversees the investigation and cleanup of fuel releases from underground storage tanks in all areas of the county with the exception of the cities of Santa Rosa and Healdsburg. Sites are entered into the LOP when a release from an underground tank is reported. The site must be investigated and cleaned up in accordance with the State Underground Storage Tank Regulations, Sonoma County Program Guidelines for Site Investigation, and RWQCB water quality objectives. The LOP is authorized to regulate underground storage tank releases by the State Water Resources Control Board.

Sonoma County Hazardous Waste Management Plan

Assembly Bill 2948 established procedures for the preparation of county Hazardous Waste Management Plans (HWMP). The plan must be prepared in accordance with *California Health and Safety Code Section* 24135 et seq. Sonoma County prepared a *Hazardous Waste Management Plan*, adopted in 1989. The HWMP is intended to serve as the primary planning document for hazardous waste management within a County, and contains goals, policies, and recommended programs for the management, recycling, and disposal of hazardous wastes. The HWMP principally governs the coordination and planning of hazardous waste disposal capacity between the County and State. The

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22 California Code of Regulations, Title 27, Division 1, Subdivision 4, Chapter 1.

California Department of Health Services must give its approval to the plan before the document becomes effective. The Sonoma County HWMP serves as the implementation program for management of hazardous waste in order to protect the health, safety, and property of residents.

Pesticides

The regulation of pesticide storage, application, and waste disposal is under the jurisdiction of the County Agricultural Commissioner; the Commissioner implements the Cal EPA Department of Pesticide Regulation (DPR) program. Since 1990 the Commissioner's office has compiled reports required of farmers and other users of agricultural pesticides which provide complete, site-specific documentation of every pesticide application. These requirements include pesticides used on parks, golf courses, cemeteries, rangeland and pastures, and along roadside and railroad rights-of-way. The reports are transferred to the DPR and entered into a statewide database.

Approximately 40 pesticide complaints are received annually by the Agricultural Commissioner's Office, half from nearby residents affected by agricultural spraying and the other half by those driving by on roadways where there is spraying. The Commissioner attempts to mediate complaints, as the office has no official jurisdiction. [23] Official jurisdiction with respect to pesticide complaints lies with the California Department of Pesticide Regulation.

Emergency Response

California has developed an Emergency Response Plan to coordinate emergency services provided by federal, State, and local government and private agencies. Response to hazardous materials incidents is one part of this plan. The plan is administered by the State Office of Emergency Services (OES), which coordinates the responses of other agencies including Cal EPA, the California Highway Patrol, California Department of Fish and Game (CDFG), the RWQCB, and the County Hazardous Materials Response Team of the DES.

The DES provides services in three areas that relate to hazardous materials. DES Emergency Management provides the primary level of coordination for emergency response, recovery, and mitigation activities following an emergency such as a hazardous materials release. DES Fire Services conducts hazardous materials inspections for businesses in Sonoma County and responds to "Haz Mat" incidents as part of the County Hazardous Materials Response Team. The DES Haz Mat Division is responsible for: the Hazardous Materials Business Management Plan Program, the Hazardous Waste Program, the Underground Tank Program, the Accidental Release Program, and parts of the Uniform Fire Code which address hazardous materials. A *Sonoma County Operational Area Hazardous Materials Incident Response Plan* addresses County and other agency response to releases of hazardous materials. The division also prepares the *Offshore Oil Spill Plan*.

County, Business, and Household Educational Programs

Educational and incentive programs encourage the use of source reduction and recycling, as well as reduced-risk pest management. The DES encourages County activities that reduce the use of hazardous materials and increase the use of safe alternatives. DES encourages County Fleet Operations to use water-based instead of petroleum-based cleaners, as well as using best management

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[23] Nichols • Berman communication with Lisa Correia, Chief Deputy Agricultural Commissioner, Sonoma County Agricultural Commission, January 2003.

practices to reduce accidental spills and separate oil from water in vehicles wash-down areas. DES encourages the Sonoma County Water Agency to use alternatives to chlorine and sulphur dioxide at water treatment plants. [24]

Other educational and incentive programs in Sonoma County include the Integrated Waste Management Agency's Household Hazardous Waste Program for residents and the DES Sonoma Green Business Program that targets businesses, including the automotive industry, graphics arts industry, and wineries. [25]

STATE REGULATIONS

The State classifies hazardous materials and hazardous wastes according to four properties: toxicity, ignitability, corrosivity, and reactivity. [26] Toxicity, ignitability, corrosivity, and reactivity are defined in the California Code of Regulations (CCR), Title 22, Sections 66261.20 through 66261.24.

The CCR defines a hazardous material as a substance that, because of physical or chemical properties, quantity, concentration, or other characteristics, may either (1) cause an increase in mortality or an increase in serious, irreversible, or incapacitating, illness; or (2) pose a substantial present or potential hazard to human health or environment when improperly treated, stored, transported or disposed of, or otherwise managed. [27]

The Cal EPA unified the State's environmental authority under a single accountable, cabinet-level agency in 1991. The Secretary for Environmental Protection oversees the following State agencies: Air Resources Board, Integrated Waste Management Board, Department of Pesticide Regulation, State Water Resources Control Board (SWRCB), Department of Toxic Substances Control (DTSC), and Office of Emergency Services (OES). The Cal EPA and the OES of the State of California establish rules governing the use of hazardous materials. The SWRCB has the primary responsibility to protect water quality and supply.

Hazardous Substances Handling Requirements

Within Cal EPA, the DTSC has primary regulatory responsibility, with delegation of enforcement to local jurisdictions that enter into agreements with the State agency, for the generation, transport, and disposal of hazardous materials under the authority of the Hazardous Waste Control Law (HWCL). Regulations implementing the HWCL list approximately 791 hazardous chemicals and 20 to 30 more common substances that may be hazardous; establish criteria for identifying, packaging and labeling hazardous substances; prescribe management of hazardous substances; establish permit requirements

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[24] *Public Safety Element- Hazardous Materials (Revision)*, CAC memo, List Posternak, Sonoma County PRMD, June 20, 2002.

[25] *Public Safety Element- Hazardous Materials (Revision)*, CAC memo, List Posternak, Sonoma County PRMD, June 20, 2002.

[26] California Code of Regulations, Title 22, Chapter 11, Article 3.

[27] California Code of Regulations, Title 22, Division 4.5, Chapter 10, Article 2, Section 66260.10

for hazardous substances treatment, storage, disposal, and transportation; and identify hazardous substances that cannot be deposited in landfills.

Under both the Resource Conservation and Recovery Act and the HWCL, the generator of a hazardous substance must complete a manifest that accompanies the waste from the point of generation to the ultimate treatment, storage or disposal location.[28] The manifest describes the waste, its intended destination, and other regulatory information about the waste. Copies must be filed with the DTSC. Generators must also match copies of waste manifests with receipts from the treatment, storage, or disposal facility to which it sends waste.

Groundwater Contamination

Acting through the RWQCBs, the SWRCB regulates surface and groundwater quality pursuant to the Porter-Cologne Water Quality Act, the federal Clean Water Act, and the Underground Tank Law. Under these laws, RWQCB is authorized to supervise the cleanup of hazardous wastes sites referred to it by local agencies in those situations where water quality may be affected.

Depending on the nature of the contamination, the lead agency responsible for the regulation of hazardous materials at the site can be the DTSC, RWQCB, or both. DTSC evaluates contaminated sites to ascertain risks to human health and the environment. Sites can be ranked by DTSC or referred for evaluation by the RWQCB. Cal EPA (DTSC) and the State Department of Occupational Health and Safety are the agencies that are responsible for overseeing that appropriate measures are taken to protect workers from exposure to potential groundwater contaminants.

Because of the potential to impact groundwater, State laws govern the design, construction, and management of USTs and their related piping and dispensing systems. CCR Title 22 governs protection of the groundwater within the State of California. Owners of USTs must obtain permits from DES for new tanks, pulling old tanks, repairing tank systems, or testing tank systems. Leaking fuel tank systems that have been found to impact groundwater resources in Sonoma County come under the enforcement jurisdiction of the State of California (i.e., either the North Coast RWQCB or the San Francisco Bay RWQCB). If leaks are detected through the County's oversight, Regional Board staff requires that investigations be done, pollutant sources be removed, necessary cleanup be done, and that groundwater be monitored. In addition, where underground tanks leak chlorinated solvents (e.g., PCE, TCE, etc) which are associated with dry cleaners, industrial sites and automotive repair facilities) or the groundwater is otherwise impacted by such hazardous materials, the RWQCB staff are the lead enforcers.

The North Coast RWQCB recently adopted more stringent waste discharge requirements for winery wastewater treatment and disposal systems applicable both to surface and subsurface systems. This responds to changes in State law and the increasing acreage devoted to vineyard production in the north coast region.

Hazardous Materials Transportation

To protect the public and the environment during the transportation of hazardous waste, stringent State and federal regulations about container packaging and labeling, vehicle identification and manifesting have been established. California law requires that hazardous waste (as defined in California Health

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[28] See *Federal Regulations* for a description of the Resource Conservation and Recovery Act (RCRA).

and Safety Code Division 20, Chapter 6.5) be transported by a California registered hazardous waste transporter that meets specific registration requirements. The requirements include possession of a valid Hazardous Waste Transporter Registration, proof of public liability insurance which includes coverage for environmental restoration, and compliance with California Vehicle Code registration regulations required for vehicle and driver licensing. A complete list of requirements can be found in Title 22 CCR, Chapter 13.

State agencies with primary responsibility for enforcing federal and State regulations and responding to hazardous materials transportation emergencies are the California Highway Patrol and Caltrans. Together, these agencies determine container types used and license hazardous waste haulers for hazardous waste transportation on public roads. On State highways, Sonoma County can request a restriction on the hours of transport of nuclear wastes, but these restrictions must be approved by the California Highway Patrol. [29]

Databases

There are numerous databases maintained by various federal, State, and local agencies that list and track hazardous waste sites, releases or spills, or shipments of hazardous materials. Databases are searched as part of Phase I / II Environmental Site Assessments. [30]

FEDERAL REGULATIONS

Federal regulatory agencies include the US Environmental Protection Act (U.S. EPA), Occupation Health and Safety Administration (OSHA), the Nuclear Regulatory Commission (NRC), the Department of Transportation (DOT), and the National Institute of Health (NIH). The following represent federal laws and guidelines governing hazardous substances:

- Federal Water Pollution Control Act
- Clean Air Act
- Occupational Safety and Health Act
- Federal Insecticide, Fungicide, and Rodenticide Act
- Comprehensive Environmental Response Compensation and Liability Act
- Guidelines for Carcinogens and Biohazards
- Superfund Amendments and Reauthorization Act Title III
- Resource Conservation and Recovery Act
- Safe Drinking Water Act
- Toxic Substances Control Act

At the federal level, the principal agency regulating the generation, transport, and disposal of hazardous substances is the US EPA, under the authority of Resource Conservation and Recovery Act (RCRA). The US EPA regulates hazardous substance sites under the Comprehensive Environmental

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29 *Public Safety Element- Hazardous Materials- Transport of Nuclear Waste*, CAC memo, Lisa Posternak, Sonoma County PRMD, July 14, 2002.

30 These assessments are to identify potential environmental liabilities on project sites resulting from existing or historic environmental hazards. Such Phase I / II assessments are done as part of Environmental Impact Reports in California.

Response Compensation and Liability Act (CERCLA). Applicable federal regulations are contained primarily in Titles 29, 40, and 49 of the Code of Federal Regulations (CFR).

Hazardous Substances Handling Requirements

The RCRA established a federal hazardous substance "cradle-to-grave" regulatory program that is administered by the U.S. EPA. Under RCRA, the U.S. EPA regulates the generation, transportation, treatment, storage, and disposal of hazardous substances. The RCRA was amended in 1984 by the Hazardous and Solid Waste Act (HSWA), which affirmed and extended the "cradle-to-grave" system of regulating hazardous substances. The HSWA specifically prohibits the use of certain techniques for the disposal of some hazardous substances. Under the RCRA, individual states may implement their own hazardous substance management programs as long as they are consistent with, and at least as strict as, RCRA. The U.S. EPA must approve State programs intended to implement the RCRA requirements.

Superfund Hazardous Waste Sites

The CERCLA, commonly referred to as Superfund, was enacted on December 11, 1980. The purpose of CERCLA was to provide authorities the ability to respond to uncontrolled releases of hazardous substances from inactive hazardous waste sites that endanger public health and the environment. CERCLA established prohibitions and requirements concerning closed and abandoned hazardous waste sites, provided for liability of persons responsible for releases of hazardous waste at such sites, and established a trust fund to provide for cleanup when no responsible party could be identified. In addition, CERCLA provided for the revision and republishing of the National Contingency Plan (NCP) that provides the guidelines and procedures needed to respond to releases and threatened releases of hazardous substances, pollutants, or contaminants. The NCP also provides for the National Priorities List, a list of national priorities among releases or threatened releases throughout the United States for the purpose of taking remedial action.

The Superfund Amendments and Reauthorization Act (SARA) amended CERCLA on October 17, 1986. This amendment increased the size of the Hazardous Response Trust Fund, expanded U.S. EPA's response authority, strengthened enforcement activities at Superfund sites; and broadened the application of the law to include federal facilities. Two superfund sites in Sonoma County have been cleaned up. [31] In addition, new provisions were added to the law that dealt with emergency planning and community right to know. SARA also required U.S. EPA to revise the Hazard Ranking System to ensure that the HRS accurately assesses the relative degree of risk to human health and the environment posed by sites and facilities subject to review for listing on the NPL.

Hazardous Materials Transportation

Two federal agencies regulate the transport of radioactive materials. The Nuclear Regulatory Commission (NRC) regulates the transport of spent nuclear fuel. The U.S. Department of Transportation (DOT) regulates the transport of radioactive materials through the Federal Motor Carrier Safety Administration. In addition, the DOT regulates the interstate transport of hazardous materials and wastes through implementation of the Hazardous Materials Transportation Act. This act specifies driver training requirements, load labeling procedures, and container design and safety

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31 *Cleanup Sites in California,* US Environmental Protection Agency, accessed online at http://www.epa.gov/region9/cleanup/california.html, May 27, 2005.

specifications. Transporters of hazardous wastes must also meet the requirements of additional statutes such as RCRA. Transportation regulations on the federal level are implemented on the state level. [32]

Hazardous Materials – Significance Criteria

According to the *State CEQA Guidelines*, the project would have a significant hazardous materials impact if it would:

- Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials;
- Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment;
- Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school;
- Be located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, resulting in a safety hazard for people residing or working in the project area;
- Be located within the vicinity of a private airstrip, resulting in a safety hazard for people residing or working in the project area; or
- Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment. **No significant impact, see *Appendix 7.4 Initial Study*.**

Hazardous Materials – Impacts and Mitigation Measures

Impact 4.13-1 Release of Hazardous Materials

Land uses and development consistent with the Draft GP 2020 could result in the transport, use, and / or disposal of hazardous materials, which could result in exposure of such materials to the public either through routine use or due to accidental release. The Draft GP 2020 includes policies that would address the hazards associated with new land uses and development. This would be a less-than-significant impact. ***(LTS)***

Land uses and development consistent with the *Draft GP 2020* would allow new agriculture, residential, commercial, and industrial uses. As a result, more hazardous materials would be

[32] *Public Safety Element – Hazardous Materials – Transport of Nuclear Waste*, memo to CAC, Lisa Posternak, Sonoma County PRMD, July 18, 2002.

transported, used, and disposed of within the county. Transport of hazardous materials, while heavily regulated, involves the risk of spills or leaks due to accidents or improper use or handling.

Increased residential development would result in an increased use, storage, and disposal of household hazardous materials within the county. In residential settings hazardous materials are typically used by individuals without extensive training in the use, storage, and disposal of those materials which could result in accidental releases into the water or sewer system.

Increased commercial and industrial development would also result in increased use, storage, and / or disposal of hazardous materials as part of their operations. Of particular concern are facilities with underground storage tanks or other methods or storage that could be impaired during a seismic event or could otherwise accidentally leak into the soil, water, or air. Such facilities include gas stations, automotive repair shops, and dry cleaners. Groundwater could become contaminated from these impairments.

New agricultural operations would also increase the usage, storage, and disposal of hazardous materials. Although the viticulture industry is taking steps to curb its usage of these materials, it would likely remain dependent upon such materials throughout the foreseeable future.

The *Draft GP 2020* includes several policies, which if adopted and implemented could be used to reduce the potential for a hazardous materials release. Goal **PS-4** and its associated objectives (**PS-4.1** and **PS-4.2**) and policies (**PS-4a** through **PS-4o**) would continue to reduce the exposure of people to hazardous substances. In particular, the associated policies would do so by implementing State and County requirements that relate to the storage, transport, use, and disposal of hazardous materials; maintaining an inventory of hazardous materials sites; requiring permits for commercial and industrial uses that could involve hazardous materials, thus allowing oversight of such materials as noted above; regulating the transportation of hazardous materials to the extent allowed by law; establishing a hazardous materials advisory group and management plan, thus providing for public information and emergency response preparedness; keeping hazardous waste processing facilities out of areas known to be subject to natural hazards and residential areas, thus protecting persons from accidental releases due to natural hazards and protecting residences from any accidental releases; siting hazardous waste processing facilities in proximity to hazardous waste producers and users, thus reducing the risk of exposure during transportation; promoting the Sonoma County Waste Management Authority's Household Hazardous Waste Program, thus reducing the possibility of improper disposal of household hazardous wastes; promoting educational programs that could reduce the use and exposure of hazardous materials in residences, businesses, and County operations; and reducing the use of toxic pesticides in County operations and encouraging others to do so as well.

These policies, in addition to the current programs and regulations discussed in the environmental setting, would continue to reduce the potential for hazardous materials release as well as reduce the potential for damage or loss from a hazardous materials release. As a result, this would be a less-than-significant impact.

Mitigation Measure 4.13-1 None required.

Impact 4.13-2 Hazardous Materials, Substances, or Waste near School Sites
Land uses and development consistent with the Draft GP 2020 could result in the increased exposure to hazardous materials in the vicinity of schools. This would be a significant impact. ***(S)***

As described in the environmental setting section, above, there are a large number of hazardous waste generating sites and treatment, storage, and disposal facilities in the county. The number of such sites and facilities has increased in the past decade and could reasonably be expected to continue to increase. Land uses and development consistent with the *Draft GP 2020* could result in the use of hazardous materials within one-quarter mile of existing schools, either at the location of an industrial use that relies upon hazardous materials or at a hazardous waste site. In addition, commercial and industrial expansion could increase the volume of hazardous materials and hazardous wastes used and generated in the county, potentially adjacent to school sites. Furthermore, new schools could be located in the vicinity of existing sites where significant quantities of hazardous materials may be present.

The *Draft GP 2020* policies discussed in *Impact 4.13-1 Release of Hazardous Materials* would reduce the potential for a hazardous materials release in the vicinity of a school site. However, these policies would not restrict the siting of facilities that may use substantial quantities of hazardous materials or facilities in which the primary purpose would be the handling of hazardous waste. Furthermore, there are no policies in the *Draft GP 2020* that would reduce the possibility that new schools would be located near existing hazardous materials sites. The siting of new schools is the responsibility of the applicable district and / or the State. Therefore, this would be a significant impact.

Mitigation Measure 4.13-2(a) Add a new policy to the Public Safety Element as follows:

> **Policy PS-4p:** Avoid siting of hazardous waste repositories, incinerators, facilities that use a substantial quantity of hazardous materials, or other similar facilities intended primarily for hazardous waste disposal within one-quarter mile of an existing or proposed school facility.

Mitigation Measure 4.13-2(b) Add a new policy to the Public Safety Element as follows:

> **Policy PS-4q:** Work with School Districts to avoid siting of schools within one-quarter mile of hazardous waste repositories, incinerators, facilities that use a substantial quantity of hazardous materials, or other similar facilities intended primarily for hazardous waste disposal.

Significance after Mitigation Adoption and implementation of the policies as outlined in Mitigation Measure 4.13-2(a) and 4.13-2(b) would assure that no new facilities involving significant quantities of hazardous substances would be developed within one-quarter mile of a school facility. This would reduce the impact to a less-than-significant level. **(LTS)**

Responsibility and Monitoring The Board of Supervisors would be responsible for adopting the policies proposed in Mitigation Measures 4.13-2(a) and 4.4-13-2(b) as part of the *GP 2020*. The PRMD and the DES would be responsible for monitoring implementation.

Impact 4.13-3 Hazardous Materials near Airports

Land uses and development consistent with the Draft GP 2020 in the vicinity of public use airports or private airstrips could expose people to accidents involving hazardous materials. Current policies and plans, carried forward in the Draft GP 2020 would address these hazards. This would be a less-than-significant impact. ***(LTS)***

Implementation of the *Draft GP 2020* could result in land uses and development located near the six public use airport located within Sonoma County that involve the use of hazardous materials. In addition, there is a possibility, although unlikely, that these uses could be located near private airstrips. The latter would be unlikely due to the remote location and rural nature of the environs of these airstrips and is not therefore considered significant. However, some of the public use airports are located near industrial or commercial lands that could include businesses that utilize hazardous materials. The location of land uses utilizing significant quantities of hazardous materials near airports raises the possibility that aircraft accidents could result in explosions, fire, or other occurrences that could cause the release of these materials and subsequent exposure of employees and other people to harm.

Development in the vicinity of these airports would be subject to discretionary review as well as review by the Sonoma County Airport Land Use Commission. Projects would be required to comply with the Commission's adopted *Comprehensive Airport Land Use Plan* (CALUP). The CALUP provides safety, noise, and compatibility standards that reduce the likelihood of accidents affecting land uses on the ground. As a result, this would be a less-than-significant impact.

Mitigation Measure 4.13-3 None required.

5.0 ALTERNATIVES

5.0 ALTERNATIVES

This chapter provides an analysis of a reasonable range of alternatives to the Proposed Project (i.e., the *Draft GP 2020*). The intent of the alternatives analysis in an EIR, as stated in the *CEQA Guidelines (Section 15126(d))*, is to describe a range of reasonable alternatives to the project, or to the location of the project, which would feasibly attain most of the basic objectives of the project but would avoid or substantially lessen any of the significant effects of the project, and evaluate the comparative merits of the alternatives. The *CEQA Guidelines (Section 15126(d(1))* state that the discussion of alternatives shall focus on alternatives to the project or its location which are capable of avoiding or substantially lessening any significant effects of the project, even if these alternatives would impede to some degree the attainment of the project objectives, or would be more costly. The feasibility of an alternative may be determined based on a variety of factors including, but not limited to, site suitability, economic viability, availability of infrastructure, general plan consistency, other plans or regulatory limitations, jurisdictional boundaries, and site accessibility and control (*CEQA Guidelines (Section 15126(d)(5)(A)))*. This chapter also identifies the environmentally superior alternative. As required by CEQA, if the environmentally superior alternative is the No Project Alternative, this chapter identifies an environmentally superior alternative among the other alternatives *(CEQA Guidelines (Section 15126.6(e)(2)))*.

5.1 DESCRIPTION OF ALTERNATIVES

This EIR examines three alternatives to the *Draft GP 2020* as presently proposed:

- Alternative 1 – The No Project Alternative
- Alternative 2 – The Buildout Alternative
- Alternative 3 – The Mitigated Alternative

The principal criterion for selecting the alternatives studied in the EIR was to comply with CEQA and ensure that the impact analysis would provide sufficient information to the public and public officials to make informed decisions about the proposed plan. An EIR conceivably could analyze an infinite number of alternatives or variations on alternatives. However, CEQA directs EIRs to analyze a reasonable range of alternatives to the project or project location which could feasibly attain basic project objectives, including at least one that would avoid or substantially lessen any of the significant effects of the proposed project. In order for the analyses to be meaningful, the alternatives also must be distinctly different and readily discernible in order to distinguish between their effects and determine the environmentally superior alternative.

Since the primary objective of the *GP 2020* is a policy review, the alternatives that are considered focus on policy alternatives. The No Project Alternative (NPA) assumes that the existing *General Plan* policies remain unchanged. [1] The other two alternatives, the Buildout Alternative (BOA) and the Mitigated Alternative (MA), have been formulated to provide environmental impact analyses of a range of policy choices. For example, the policy choices for protection of riparian corridors range

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1 *Sonoma County General Plan*, adopted by the Sonoma County Board of Supervisors on March 23, 1989, as amended.

significantly from relatively small conservation areas on just a few streams to larger conservation areas on many streams. Therefore, for this example, the purpose of the Buildout Alternative is to evaluate the impacts of less restrictive riparian protection policies than the *Draft GP 2020*. Similarly, the purpose of the Mitigated Alternative is to identify the impacts of policies that are more restrictive than the proposed project.

Exhibit 5.0-1 compares population, household, and employment for each of the three alternatives, as well as the proposed project.

Exhibit 5.0-1
Total County Population, Households, and Employment – GP 2020 EIR Alternatives

Category	*Existing Conditions (2000)*	*Draft General Plan 2020 (Proposed Project)*	*No Project Alternative*	*Buildout Alternative*	*Mitigated Alternative*
Population [a]					
City USA Total	330,018	398,370	398,370	398,370	398,370
Unincorporated	128,596	147,660	147,660	175,992	147,660
Total	458,614	546,030	546,030	574,362	546,030
Households					
City USA Total	123,127	154,265	154,265	154,265	154,265
Unincorporated	49,276	56,620	56,620	67,489	56,620
Total	172,403	210,885	210,885	221,754	210,885
Total Employment [b]					
City USA Total	177,910	252,060	252,060	252,060	252,060
Unincorporated	27,310	37,200	37,200	126,619	33,480
Total	205,220	289,260	289,260	378,679	285,540
Employed Residents [b]					
City USA Total	164,389	227,700	227,700	227,700	227,700
Unincorporated	64,918	82,000	82,000	97,735	82,000
Total	229,307	309,700	309,700	325,435	309,700
Vineyards Planted (acres)	59,000	75,000	75,000	97,500	67,000

Note: The difference between the No Project Alternative and the *Draft GP 2020* is the difference made by the policies in the *Draft GP 2020*.

[a] Existing population is from the 2000 Census. Projected population for the *Draft GP 2020* and each of the alternatives is derived from ABAG *Projection 2002* and the General Plan land use maps.

[b] Total employment and employed residents is derived from ABAG *Projections 2002* employment projections.

Source: Sonoma County PRMD, 2004; *Sonoma County 1989 General Plan;* and Association of Bay Area Governments (ABAG) Projections.

Description of Project Alternatives

The discussion of project alternatives focuses on a range of policy changes for each alternative that would have a bearing on the environmental analysis of the proposed project and would assist the decision makers in identifying policy options that avoid or substantially lessen the significant impacts identified for the proposed project. Thus, the description of each alternative is focused on the differences in the extent of future land uses and development allowed and in the range of policy choices described in each alternative. The following discussion describes the policy choices for each of the three alternatives and identifies the key differences among them.

LAND USE, POPULATION AND HOUSING

The Draft GP 2020

The current land use map designations would be revised in a very limited way, primarily for map corrections and corresponding changes resulting from new policies such as the designation of affordable housing sites. Urban Service Boundaries would be adjusted slightly, mostly to reflect annexations since 1989. Church and school siting policies would be modified to reduce, compared to the existing *General Plan*, the potential for these uses to be located in rural areas. Additional proposed policies restricting resorts and hotels in the rural areas would make them more difficult to be approved than under the existing *General Plan*. Certificates of Compliance would be harder to obtain resulting in less development. Policies would make it possible to accommodate permanent residency at recreational vehicle (RV) parks and campgrounds and streamline the process for public uses throughout the unincorporated area.

No Project Alternative (NPA)

The current land use map designations would be unchanged, including the Urban Service Boundaries. Additional affordable housing sites would not be included. Church and school siting policies would continue to allow these uses in rural areas, but subject to criteria restricting the location and size. Policies related to Certificates of Compliance would remain restrictive, but not as much so as under the *Draft GP 2020*. Resort and hotel uses would not be allowed unless the site was designated RVSC on the land use map. Permanent residency would not be allowed in either RVs or campgrounds. Public uses would be allowed, but the process would not be as streamlined as under the *Draft GP 2020*.

Buildout Alternative (BOA)

Land use map designations would be revised to accommodate all of the land use requests listed in ***Appendix 7.5 Land Use Amendment Requests***, including the proposed affordable housing sites. Compared to the *Draft GP 2020*, Urban Service Boundaries would be expanded slightly and churches and schools would be allowed more readily in rural areas. Similar to the *Draft GP 2020*, permanent residency in RVs and campgrounds would be allowed. Unlike the *Draft GP 2020*, resorts and hotels would more readily be allowed under certain criteria in rural areas. Certificates of Compliance and public use policies would be the same as under the No Project Alternative.

Mitigated Alternative (MA)

The land use map designations would remain the same as in the No Project Alternative as would the policies pertaining to public uses. Additional affordable housing sites would not be included. Churches and schools would be prohibited in rural areas. Urban Service Boundaries would be the same as those under the *Draft GP 2020*. Community Separator boundaries would be expanded as described in the Scenic Resources section below. Permanent occupancy of RVs and campgrounds would not be allowed. Policies related to resorts and hotels and to Certificates of Compliance would be the same as under the *Draft GP 2020*.

TRANSPORTATION

The Draft GP 2020

The existing *General Plan* policies related to transit and alternative modes of travel would be enhanced to better support non-vehicular travel. Development of the SMART passenger rail would be supported. Planned road and highway improvements would be updated and constructed, including projects that would be funded in part by recently approved Measure M. Level of Service (LOS) objectives and standards and road classifications would be updated to reflect projected growth and planned improvements. Traffic calming improvements would be added in some communities. In the Penngrove community, improvements would include traffic calming, widening Petaluma Hill Road and Railroad Avenue to three lanes where necessary to provide driveway access, a realignment of the Petaluma Hill/Railroad Avenue intersection to influence traffic to flow east-west on Railroad Avenue, and a southbound interchange at Railroad Ave and US 101.

No Project Alternative

Existing policies would continue to promote transit use, but would not include development of the SMART passenger rail system. Alternative modes of travel would continue to be promoted. Road and highway improvements would include only those that are currently funded and would not include Measure M projects in the unincorporated area since these are not fully funded at this time. Road classifications would not be updated and LOS standards would be outdated after 2005. Traffic calming improvements would not be included. In the Penngrove Community, the existing road system would remain relatively unchanged.

Buildout Alternative

The policies in this alternative are the same as those under the No Project Alternative.

Mitigated Alternative

Policies and improvements would include those under the *Draft GP 2020*. Additional improvements would be included from the "Wish List" scenario that was prepared for the *Draft GP 2020* and reviewed and considered by the Citizen's Advisory Committee, which includes the projects that would be funded in part by recently approved Measure M. This list also includes many improvements which are considered to be unlikely to be funded or supported by the public and which were not included in the CAC's recommended improvements. In the Penngrove community, improvements would include widening Petaluma Hill Road, Adobe Road, and Railroad Avenue to four lanes, an eastern bypass, and widening Main Street to three lanes. Although not included in the traffic modeling for this alternative, the southerly extension of Bodway from Railroad Avenue to Old Redwood Highway and traffic

calming improvements designed to restrict traffic movement through Penngrove could be included under this alternative.

AIR QUALITY

All three alternatives, similar to *Draft GP 2020*, assume that air quality policies would be the same as those in the existing *General Plan*.

NOISE

The Draft GP 2020

The noise standards would be more restrictive for new noise generating uses and for noise sensitive uses in noisy areas than under the existing *General Plan*. However, more flexibility would be provided in the application of standards to projects in rural areas. Overall, even with the flexibility, the noise policies and standards would be slightly more protective of noise sensitive uses than under the existing *General Plan*.

No Project Alternative

Existing noise policies establish standards for new noise generating uses in noise sensitive or rural areas and for noise sensitive uses in noise impacted areas. These standards would continue to be relatively inflexible in cases where land uses generate infrequent loud noises or when adjacent uses are far from the noise source, making it unnecessarily difficult to site projects that do not result in an actual noise impact.

Buildout Alternative

With some exceptions, the policies in this alternative are the same as those under the *Draft GP 2020*. The exceptions would allow new development projects to exceed the maximum noise levels for short periods of time during each hour, would allow certain types of housing and mixed use projects to be exposed to slightly higher noise levels in urban communities, and would provide for flexibility in meeting noise standards in cases where ambient noise exceeds the standard.

Mitigated Alternative

The noise standards would be the same as under the *Draft GP 2020*. However, the flexibility provisions under the *Draft GP 2020* would not be available, restricting against some new noise generating uses and against some new noise sensitive uses in noisy areas.

HYDROLOGY AND WATER RESOURCES

The Draft GP 2020

The new Water Resources Element would substantially increase the County's focus on water resource issues compared to the existing *General Plan*. Protection of groundwater resources would increase substantially over time with policies that expand well permitting requirements and call for more comprehensive monitoring of groundwater conditions countywide compared to the existing *General Plan*. Annual reporting and appropriate management actions tailored to areas with identified problems

would be supported. Additional policies related to protection of surface water supplies would be included as well as policies supporting coordination among the suppliers and planning entities to assure adequate supplies for planned growth in keeping with the principle of sustainable yield. Water quality policies would increase protection for municipal wells, increase assurance of the quality of re-used water, increase protection for groundwater recharge, and increase coordination with Water Quality Control Boards to address water quality problems associated with runoff from uses with significant impervious surfaces. New policies addressing flood hazards would include long-term plans to address repetitive losses and expansion of the zero net-fill regulations to all flood areas.

No Project Alternative

The No Project Alternative would include many policies addressing water resources in general, but policies would not be as comprehensive or as aggressive in terms of water resource management as under the *Draft GP 2020*. Policies would continue to focus on reducing development in recharge areas, monitoring groundwater for commercial uses on wells, addressing groundwater supply for projects in water scarce areas, encouraging research and monitoring of groundwater conditions, avoiding obstructions to stream flows from grading and construction, and encouraging proper wastewater management. Similar to the *Draft GP 2020,* existing regulations also address storm water pollution from most new development and redevelopment. Flooding is addressed through siting and standards for development in flood hazard areas, flood plain management and master drainage planning.

Buildout Alternative

The policies in this alternative are the same as those under the No Project Alternative.

Mitigated Alternative

The same policies would be in effect as those under the *Draft GP 2020*. In addition, water quality policies would expand storm water pollution controls to all new uses. More substantial funding would be made available to establish public wastewater systems in areas with chronic problems from failing septic systems and to upgrade existing public wastewater systems where necessary. New fresh water exports outside of the county would be prohibited. Well permit requirements would be stricter than under the *Draft GP 2020* and additional funding and support would be committed to groundwater studies and monitoring. A countywide groundwater management plan would be initiated consistent with State law.

BIOLOGICAL RESOURCES

The Draft GP 2020

Riparian corridor protection would be expanded to about 3,500 miles of county streams with expanded conservation zones varying from 100-200 feet from the top of bank. Use standards within the zones would be more restrictive than under the No Project Alternative. Biotic habitat protection would be significantly expanded from the No Project Alternative to include all CNDDB mapped habitats. Use standards in designated habitat areas would be more restrictive and County permit requirements would be similar to and coordinated with State and federal requirements, making permits more difficult to obtain. A program would be included to consider increased oak habitat protection through adoption of an ordinance. Policies would call for the County to initiate a comprehensive habitat mapping program for the unincorporated area.

No Project Alternative

Riparian corridor protection would continue to apply to about 500 miles of county streams with conservation zones varying from 50-200 feet from top of bank. Existing use standards would continue to allow some uses in the conservation zone subject to specified criteria. Biotic habitat protection would apply to wetlands and rare and endangered habitats known and designated in 1989. Valley oaks protection would continue. State and federal regulation would continue to govern habitats for listed species or other species of concern. There would be no general plan support for a habitat mapping program.

Buildout Alternative

Riparian corridor protection would apply to the same streams and conservation zones as under the No Project Alternative. However, the use standards would be less restrictive than under the No Project Alternative, allowing more reductions, waivers, and exemptions for some situations. Biotic habitat protection would be the same as under the No Project Alternative, with no support for a habitat mapping program.

Mitigated Alternative

Similar to the *Draft GP 2020*, riparian corridor protection would apply to some 3,500 miles of county streams with conservation zones varying from 100-200 feet. Use standards would be more restrictive than under the *Draft GP 2020*, virtually eliminating exemptions, waivers, and reductions from the standards. Ephemeral streams would also be protected by conservation zones where they feed directly into a perennial or intermittent stream. Biotic habitat protection would be similar to the *Draft GP 2020*, but where County permit procedures are coordinated with federal and State agency requirements under the *Draft GP 2020*, this alternative would require prior approval of State and federal agencies, making many permits much more difficult to obtain than under the *Draft GP 2020*. A countywide habitat conservation plan would be initiated.

GEOLOGY AND SOILS

The Draft GP 2020

In addition to existing policies avoiding residences near fault zones and requiring structures be designed to withstand seismic events, policies would be added requiring that structures be sited and designed to avoid damage from severe ground shaking. A new ordinance requiring that Unreinforced Masonry Buildings (UMBs) be strengthened and / or reinforced would be considered.

No Project Alternative

Policies protecting the public from geologic hazards include avoidance of structures near fault zones and structural requirements in seismic zones throughout the county. No policies would specifically address ground shaking, although existing policies and regulations would often provide similar results. There would be no new policy regarding UMBs.

Buildout Alternative

The policies in this alternative are the same as under the No Project Alternative.

Mitigated Alternative

The same policies would be in effect as those under the *Draft GP 2020*. However, strengthening and / or reinforcement of UMBs would be required rather than considered.

AGRICULTURAL AND TIMBER RESOURCES

The Draft GP 2020

Agricultural tourism would be strongly promoted as necessary for support of agricultural production. Limits would be placed upon tourism to assure that agricultural production remains the primary use by requiring a demonstration of the linkage of tourism to production and by avoiding over-concentration. Special events would be controlled over time through coordinated scheduling.

Agricultural processing and other support uses would also be promoted as necessary for agricultural production, but would be regulated to avoid over-concentration. Processing operations would be required to include at least 50 percent of crops from the site or local area. Other support uses, including storage, bottling, canning, and support services would be allowed but limited to a level which is incidental or secondary to agricultural production. Rural Residential lands would not be redesignated as agricultural lands, thereby avoiding the extension of agricultural tourism and support uses to these areas.

Timber harvest operations would remain the purview of State regulation. However, County policies would be added to the General Plan that would limit timber conversions to very restrictive circumstances and would establish timber resource conservation as a priority over other non-timber uses on timberlands.

No Project Alternative

Agricultural tourism would continue to be supported, but not as strongly as in the *Draft GP 2020*. Tourism activities would continue to be allowed, but limited to certain types of facilities such as bed and breakfast inns, tasting, campgrounds, and sales stands. Special events would continue to be allowed, but would be determined on a case by case basis without the benefit of the event coordination effort that is included under the *Draft GP 2020*.

Agricultural processing and other support uses would be strongly supported as long as they are demonstrated to be related to and supportive of local agricultural production as in the *Draft GP 2020*. Over-concentration policies would not be included. Rural Residential lands would not be redesignated to agricultural lands and would continue to restrict against most tourism and agricultural support uses.

Timber harvest operations and timber conversions would continue to be regulated only by the State. No policies would be included in the General Plan that would affect timber conversions.

Buildout Alternative

Similar to the other alternatives, both agricultural tourism and agricultural processing and support uses would be strongly supported as necessary for agricultural production. However, the requirements for demonstration of the linkage of these uses to agricultural production would be slightly less, thereby allowing for these uses to be broader in scope. As in the No Project Alternative, there would be no policies pertaining to event coordination or over-concentration. Unlike the *Draft GP 2020*, Rural Residential lands that are currently zoned Agriculture and Residential (AR) would be redesignated as

agricultural lands, allowing agricultural tourism and agricultural support uses under the same policies and standards as under the *Draft GP 2020*.

As in the No Project Alternative, timber harvest operations and timber conversions would be regulated only by the State.

Mitigated Alternative

Agricultural tourism and processing and support uses would be supported with the same policies as under the *Draft GP 2020*. Agricultural processing operations would be required to include at least 75 percent of crops from the site or local area. Other agricultural support uses would be limited as in the *Draft GP 2020*. Rural Residential lands would not be redesignated to agricultural lands.

Policies would be added that would restrict against timber harvest operations outside of the Timber Production zoning district in the vicinity of residential uses. Policies would also be added that would, to the extent allowed by State law, establish timber resource conservation priority over non-timber uses on timberlands and prohibit timber conversions on timberland.

PUBLIC SERVICES

The Draft GP 2020

Policies of the existing *General Plan* would be included and supplemented by policies calling for improved coordination with special districts providing water and sewer services. Future water and sewer capacity assumptions would be the same as under the existing *General Plan*. Existing policy limitations on extension of sewer services would remain in effect, with continued emphasis on avoiding sprawl, but more flexibility would be allowed to extend public water to parcels with water quality or water availability problems. Package Treatment Plants would be more strictly regulated compared to the existing *General Plan* and would be limited only to public and agricultural support uses.

Regarding fire services, policies under the existing *General Plan* would be supplemented by policies calling for upgrading of the County's street addressing system and education of residences and businesses on fire safe practices. Additional regulations would be considered for sprinkler systems in new structures. A development fee or other funding mechanism would also be considered to pay for the additional fire services impact of new development.

No Project Alternative

Policies would continue to support master facility planning for and by the public water and sewer providers. Future water and sewer capacity would be expanded to accommodate planned growth, although expansion in some districts may be difficult to achieve. Policies would continue to limit provision of these services outside of Urban Service Boundaries in order to avoid sprawl, as under the *Draft GP 2020*. Package Treatment Plants would continue to be allowed for all uses unless the use is for multiple parcels under separate ownership.

New development would continue to be subject to review and mitigation for fire hazards under the fire codes and fire safe standards. Policies would also continue to support coordinated fire services among all providers.

Buildout Alternative

The policies in this alternative would be the same as under the No Project Alternative except that Package Treatment Plants would be allowed for all uses without limitation on multiple parcels under separate ownership.

Mitigated Alternative

Policies would be the same as under the *Draft GP 2020*, except that the policies regarding extension of sewer and water services would remain the same as under the No Project Alternative. Water and sewer capacity would not be expanded to accommodate new growth.

The policies of the *Draft GP 2020* regarding fire services would be included, but the fire service impact funding and the sprinkler system regulations would be required rather than considered.

CULTURAL RESOURCES

All three alternatives, similar to the *Draft GP 2020*, assume that cultural resource policies would be the same as those in the existing *General Plan*.

SCENIC RESOURCES

The Draft GP 2020

The Community Separators and Scenic Landscape Unit siting and design standards would be more restrictive, generally providing for better visual quality than under the existing *General Plan*. Community Separator boundaries would not necessarily change, but a program to evaluate new or expanded Community Separators around urban areas would be included. New general design guidelines for lighting and glare, urban design, and rural character would be included as well as a more aggressive program to develop detailed guidelines for each community than under existing policy.

No Project Alternative

Policies would continue to protect designated Community Separators, Scenic Landscape Units, and Scenic Corridors with standards that would provide for siting and screening of structures from public roads. Community Separator boundaries, which provide visual separation between and containment around urban areas, are specifically designated on the Open Space maps and would not change. Siting and design guidelines for areas not designated above would continue to be addressed through Local Area Development Guidelines in some communities and rural areas such as Glen Ellen, Occidental, and Sonoma Mountain. There would be no design guidelines addressing urban design or rural character or lighting and glare issues.

Buildout Alternative

The policies in this alternative would be the same as under the No Project Alternative.

Mitigated Alternative

Policies would be the same as under the *Draft GP 2020*, but the siting standards in Community Separators and Scenic Landscape Units would generally require greater screening of structures and

thereby would be more protective of scenic resources. Community Separator boundaries would be expanded to include additional lands around Cloverdale, Rohnert Park, Sonoma Mountain, and other "Priority Greenbelt" areas designated in the Sonoma County Agricultural Protection and Open Space District's *Acquisition Plan 2000*.

ENERGY RESOURCES

The Draft GP 2020

Policies of the existing *General Plan* would be replaced with new policies that promote energy conservation and demand reduction as well as policies that guide energy production and supply. Energy demand reduction would occur through public education and through energy conservation efforts for County government operations. Energy supply and production policies would focus on energy facility siting policies and promotion of renewable energy and distributed energy generation systems in County operations and private development.

No Project Alternative

Policies would continue to promote development of alternative energy sources, such as wind, biomass, gas, and solar subject to guidelines protecting visual resources, but would not be as aggressive in promoting energy conservation and alternative sources as under the *Draft GP 2020*. Policies would continue to oppose offshore oil drilling and related onshore support facilities. Telecommunication facilities would continue to be subject to visual protection policies.

Buildout Alternative

The policies in this alternative would be the same as under the No Project Alternative.

Mitigated Alternative

The policies in this alternative would be the same as under the *Draft GP 2020*.

HAZARDOUS MATERIALS

The Draft GP 2020

Policies of the existing *General Plan* would be supplemented by educational programs related to the Household Hazardous Waste Program, Green Business Program, and alternatives to pesticides. County operations would be required to reduce the use of toxic pesticides and work with the cities to the same purpose.

No Project Alternative

Existing policies would continue to minimize exposure of the public to hazardous materials from stationary and mobile sources, primarily through the review of discretionary projects, but also through management of the waste system, siting of hazardous waste repositories, and health regulations regarding transport, storage, disposal, and use. No policies would directly address pesticide use, although State and federal law regulate these materials.

Buildout Alternative

The policies in this alternative would be the same as under the No Project Alternative.

Mitigated Alternative

The policies in this alternative would be the same as under the *Draft GP 2020*.

COMPARISON OF ALTERNATIVES

Based on the discussion below, the impacts and comparison of the alternatives with the *Draft GP 2020* are summarized in **Exhibit 5.0-2**. In this exhibit, NPA Impact, BOA Impact, and MA Impact refer to the level of impact that would occur with implementation of the No Project Alternative (NPA), the Buildout Alternative (BOA), and the Mitigated Alternative (MA), respectively. In addition, NPA Comp., BOA Comp., and MA Comp. compare the level of impact that would occur under the alternative with what would occur under the *Draft GP 2020.* For example, *Impact 4.1-1 Growth and Concentration of Population* would be a less-than-significant impact under the Mitigated Alternative. In comparison, the level of impact that would occur under the Mitigated Alternative would be less than what would occur under the *Draft GP 2020*. Reasons used to determine the comparative level of impact between each alternative are provided for each impact under the analysis of the three alternatives.

Exhibit 5.0-2
Comparison of Alternatives

Impact of the Draft GP 2020		*Draft GP 2020 Impact*	*NPA Impact*	*NPA Comp.*	*BOA Impact*	*BOA Comp.*	*MA Impact*	*MA Comp.*
4.1-1	Growth and Concentration of Population	LTS	LTS	>	S	>	LTS	<
4.1-2	Land Use Conflicts between Agricultural and Residential /Urban Uses	S	S	>	S	>	S	<
4.1-3	Incompatible Land Uses in the Rural Area	S	S	>	S	>	S	<
4.1-4	Affordable Housing	LTS	LTS	<	LTS	-	LTS	<
4.2-1	Congestion on County and City Roadway Segments	S	S	>	S	>	S	<
4.2-2	Congestion on State Highways	S	S	>	S	>	S	<
4.2-3	Congestion on portions of US 101 in several areas between Cotati to north of Windsor	S	S	>	S	>	S	<
4.2-4	Congestion at Key Intersections throughout the County	S	S	>	S	>	S	<

Impact of the Draft GP 2020		*Draft GP 2020 Impact*	*NPA Impact*	*NPA Comp.*	*BOA Impact*	*BOA Comp.*	*MA Impact*	*MA Comp.*
4.2-5	Increased Demand for Transit Services	LTS	S	>	S	>	LTS	<
4.2-6	Air Traffic Safety	LTS	LTS	-	LTS	-	LTS	-
4.2-7	Conflict with Alternative Transportation	LTS	LTS	>	LTS	>	LTS	-
4.2-8	Lack of Parking Capacity or Emergency Access	LTS	LTS	-	LTS	-	LTS	-
4.2-9	Safety Risk from Transportation System Design	LTS	LTS	-	LTS	-	LTS	-
4.3-1	Increased Emissions of Ozone Precursors	S	S	>	S	>	S	<
4.3-2	Increased Particulate Emissions	LTS	LTS	>	LTS	>	LTS	-
4.3-3	Exposure to Odors/Toxic Air Contaminants	S	S	-	S	-	S	-
4.3-4	Exposure to Industrial Diesel Truck Emissions	S	S	>	S	>	S	<
4.3-5	Aircraft Emissions	LTS	LTS	-	LTS	-	LTS	-
4.4-1	Increased Traffic Noise	S	S	>	S	>	S	-
4.4-2	Impact to Noise Sensitive Development From Roadway Noise	LTS	LTS	>	LTS	>	LTS	-
4.4-3	Increased Rail Noise	S	LTS	<	LTS	<	S	-
4.4-4	Impact to Noise Sensitive Developments from Stationary Noise Sources	LTS	LTS	>	LTS	>	LTS	<
4.4-5	Airport Noise	LTS	LTS	-	LTS	-	LTS	-
4.5-1	Water Quality – Residential, Commercial, Industrial and Public Uses	LTS	LTS	>	S	>	LTS	<
4.5-2	Water Quality – Soil Erosion and Sedimentation Related to Construction	LTS	LTS	>	LTS	>	LTS	<
4.5-3	Water Quality – Agricultural and Resource Uses	S	S	>	S	>	S	<
4.5-4	Water Quality – Wastewater Disposal	LTS	LTS	>	LTS	>	LTS	<
4.5-5	Groundwater Level Decline	S	S	>	S	>	S	<

Impact of the Draft GP 2020		*Draft GP 2020 Impact*	*NPA Impact*	*NPA Comp.*	*BOA Impact*	*BOA Comp.*	*MA Impact*	*MA Comp.*
4.5-6	Saltwater Intrusion	LTS	S	>	S	>	S	<
4.5-7	Well Competition and Adverse Well Interference	S	S	>	S	>	S	<
4.5-8	Changes to Drainage Patterns Leading to Streambank Erosion	S	S	>	S	>	S	<
4.5-9	Increased Flood Risk from Drainage System Alteration	LTS	LTS	>	LTS	>	LTS	<
4.5-10	Place Housing or Structures in 100-Year Flood Hazard Areas	LTS	LTS	>	LTS	>	LTS	-
4.5-11	Impede or Redirect Flows in Flood Hazard Areas	S	S	>	S	>	S	-
4.5-12	Failure of Levee or Dam	S	S	-	S	-	S	-
4.6-1	Special Status Species	S	S	>	S	>	S	<
4.6-2	Sensitive Natural Communities	S	S	>	S	>	S	<
4.6-3	Wetlands	LTS	S	>	S	>	LTS	<
4.6-4	Wildlife Habitat and Movement Opportunities	S	S	>	S	>	S	<
4.6-5	Conflict with Local Policies or Ordinances	LTS	LTS	-	LTS	-	LTS	-
4.6-6	Conflict with Adopted Habitat or Natural Community Conservation Plans	LTS	LTS	-	LTS	-	LTS	-
4.7-1	Seismic Ground Shaking	S	S	>	S	>	S	<
4.7-2	Seismic Related Ground Failure	S	S	>	S	>	S	<
4.7-3	Landsliding	S	S	>	S	>	S	<
4.7-4	Subsidence and Settlement	S	S	>	S	>	S	<
4.7-5	Tsunamis and Seiches	S	S	>	S	>	S	<
4.7-6	Soil Erosion	S	S	-	S	>	S	<
4.7-7	Expansive Soils	LTS	LTS	>	LTS	>	LTS	<
4.7-8	Septic Suitability of Soils	LTS	LTS	-	LTS	-	LTS	-
4.7-9	Mineral Resources	LTS	LTS	-	LTS	-	LTS	-
4.8-1	Conversion of Agricultural Lands to Non-Agricultural Uses	LTS	LTS	<	LTS	<	LTS	>
4.8-2	Agricultural Processing	LTS	LTS	>	LTS	>	LTS	<
4.8-3	Agricultural Tourism	LTS	LTS	>	LTS	>	LTS	-

Impact of the Draft GP 2020		*Draft GP 2020 Impact*	*NPA Impact*	*NPA Comp.*	*BOA Impact*	*BOA Comp.*	*MA Impact*	*MA Comp.*
4.8-4	Timberland Conversion	LTS	LTS	>	LTS	>	LTS	<
4.9-1	Insufficient Water Supplies to Meet Future Water Demand of the Urban Service Areas	S	S	<	S	>	S	<
4.9-2	Insufficient Water Supplies to Meet the Future Water Demand of Rural Private Domestic, Small Municipal, and Agricultural Wells	S	S	>	S	>	S	-
4.9-3	New or Expanded Water Supply Facilities	S	S	>	S	>	LTS	<
4.9-4	Increased Wastewater Treatment Demand	S	S	<	S	>	S	<
4.9-5	New or Expanded Wastewater Facilities	S	S	-	S	>	LTS	<
4.9-6	Increased Solid Waste Disposal Demand	S	S	-	S	>	S	-
4.9-7	Increased Demand for Parks and Recreation Services and Facilities	S	S	-	S	>	S	-
4.9-8	Demand for Public Education Services and Facilities	LTS	LTS	-	S	>	LTS	<
4.9.9	Increased Demand for Fire Protection and Emergency Services Facilities	S	S	>	S	>	S	<
4.9-10	Wildland Fire Hazards	S	S	>	S	>	S	<
4.9-11	Demand for Additional Criminal Justice Facilities	S	S	-	S	>	S	<
4.9-12	Increased Demand for Library Facilities	S	S	-	S	>	S	<
4.9-13	Increased Demand for Human Service Facilities	S	S	-	S	>	S	<
4.10-1	Historic Resources	S	S	>	S	>	S	<
4.10-2	Archaeological and Paleontological Resources	S	S	>	S	>	S	<
4.11-1	Community Separators, Scenic Landscape Units, Scenic Corridors, and Scenic Highways	LTS	LTS	>	S	>	LTS	<
4.11-2	Visual Impacts in Other Urban and Rural Areas	LTS	S	>	S	>	LTS	<

Impact of the Draft GP 2020		*Draft GP 2020 Impact*	*NPA Impact*	*NPA Comp.*	*BOA Impact*	*BOA Comp.*	*MA Impact*	*MA Comp.*
4.11-3	Light Pollution and Nighttime Sky	S	S	>	S	>	S	<
4.12-1	Energy Consumption from Land Use Locations and Patterns	LTS	LTS	-	LTS	-	LTS	-
4.12-2	Energy Consumption from Building Construction and Retrofit	LTS	LTS	>	S	>	LTS	<
4.12-3	Increased Energy Demand and Need for Additional Energy Resources	S	S	>	S	>	S	<
4.13-1	Release of Hazardous Materials	LTS	LTS	>	LTS	>	LTS	-
4.13-2	Hazardous Materials, Substances, or Waste near School Sites	S	S	>	S	>	S	-
4.13-3	Hazardous Materials Near Airports	LTS	LTS	>	LTS	>	LTS	-

> Means the impact under this alternative would be greater than that of the *Draft GP 2020.*
< Means the impact under this alternative would be less than that of the *Draft GP 2020.*
- Means the impact under this alternative would be similar or equal to that of the *Draft GP 2020.*

5.2 ALTERNATIVE 1 NO PROJECT ALTERNATIVE

CEQA requires the evaluation of the comparative impacts of the No Project Alternative.[2] The No Project Alternative refers to the consequences of declining to adopt the proposed project or project alternatives. The *CEQA Guidelines* state that the No Project Alternative analysis should discuss existing conditions as well as what would be reasonably expected to occur in the foreseeable future based on current plans and consistent with available infrastructure and community services.

Because the proposed project is an update of the County's existing *General Plan*, there are entitlements and ministerial actions that would allow further land uses and development under the existing *General Plan* that would make it difficult to halt further development. Even if the County were to cease approving new projects in the unincorporated area, new development would continue in the nine cities within the county. The *No Action* alternative is a more realistic forecast of the consequences of not acting on the proposed project, compared to a *No Development* alternative.

Thus, the No Project Alternative considers the impacts that would occur if the County did not approve the General Plan update but development continued under the existing *General Plan* and current zoning designations and code. Future growth would continue. There would be buildout on vacant

2 *CEQA Guidelines* Section 15126.6(e)(1).

lots, future subdivisions as currently allowed, development in accord with existing policies, and continued city infill and annexation as allowed by the general plans of the nine cities.

In this alternative, the existing policies and regulations would continue to guide existing patterns of land use. As shown in **Exhibit 5.0-1**, above, this alternative would result in the same level of population growth as the *Draft GP 2020*, as well as the same number of households, employment, and employed residents. The difference between the No Project Alternative and the *Draft GP 2020* is the effect that the new and revised policies in the *Draft GP 2020* would have in a number of areas, such as designating affordable housing sites, protecting the environment, improving water quality, and addressing traffic congestion in areas such as Penngrove. The new and revised policies proposed in the *Draft GP 2020* would not come to fruition if the *Draft GP 2020* were not approved.

The key policy choices that are assumed to be in place under this alternative are identified in ***Section 5.1 Description of Alternatives***.

Analysis of No Project Alternative

LAND USE, POPULATION, AND HOUSING

Impact 4.1-1 Growth and Concentration of Population

The No Project Alternative would result in a less-than-significant impact related to growth and concentration of population. Under this alternative, the Urban Service Boundaries (USBs) and land use designations in the existing *General Plan* would continue to apply. Existing land use designations and land use patterns would be similar to those of the *Draft GP 2020.* Population and housing growth in the unincorporated area would be the same as the *Draft GP 2020* as well as consistent with Association of Bay Area Government (ABAG) projections. Goals objectives and policies of the existing *General Plan* related to city and community centered growth and the stabilization of agricultural use at the urban fringe would remain largely unchanged by the *Draft GP 2020*. Although existing policies regulating water supply and sewer services are less comprehensive than those in the *Draft GP 2020,* they would avoid the extension of services beyond the USBs. Therefore, similar to the proposed project, this alternative would avoid urban sprawl and unplanned development in the unincorporated area. However, this alternative could result in more churches in rural areas and greater use of package wastewater treatment plants. As a result, the impact could be greater than under the *Draft GP 2020*.

Impact 4.1-2 Land Use Conflicts between Agricultural and Residential / Urban Uses

The No Project Alternative would result in a significant impact related to land use conflicts between agricultural and residential urban uses. Policies in the existing *General Plan* designed to reduce agricultural and urban land use conflicts by limiting the intrusion of new residential uses into agricultural areas as well as mitigating conflicts between such uses in designated agricultural production areas, would apply and be the same as those of the *Draft GP 2020*. In addition, the Sonoma County Right to Farm Ordinance would continue to support existing *General Plan* policies, educate the public about agricultural operations and their importance, as well as reduce land use conflicts between agricultural and urban neighbors. However, as with the *Draft GP 2020*, these policies would not reduce the conflict between agriculture and urban uses to a less-than-significant level. Moreover, under this alternative, noise policies and standards may allow more noise sensitive

uses in noise impacted areas than under the *Draft GP 2020*. If this were to occur, land use conflicts could be slightly greater under the No Project Alternative.

Impact 4.1-3 Incompatible Land Uses in the Rural Area

The No Project Alternative would result in a significant impact related to incompatible land uses in rural areas. The development of agricultural processing and agricultural tourism uses as well as the use of package wastewater treatment plants would be less strictly regulated under this alternative and could result in impacts that would greater than that of the proposed project. Therefore, land use conflicts resulting from these uses on rural agrarian lands would represent a significant impact under this alternative that would be greater than under the *Draft GP 2020*.

Impact 4.1-4 Affordable Housing

The No Project Alternative would result in a less-than-significant impact resulting from the development of affordable housing projects. The No Project Alternative would not provide additional sites for Affordable Housing projects as proposed in the *Draft GP 2020*. Therefore, the No Project Alternative would have a lesser impact than the *Draft GP 2020* in this area. However, a major implementation program of the Housing Element would not be fulfilled.

TRANSPORTATION

As discussed in ***Section 4.2 Transportation,*** to identify potential levels of traffic impacts, a traffic analysis for the No Project Alternative was performed using a computer-based traffic model. **Exhibit 5.0-3** shows those roadways that would have a significant impact in 2020 based on adoption and implementation of the No Project Alternative. This analysis uses the same thresholds of significance as used in ***Section 4.2 Transportation***.

Analysis of the alternatives focuses on the PM peak hour level of service. The PM peak (also referred to as the afternoon peak) typically occurs between 4:30 PM and 5:30 PM, at least on commuter-oriented routes. In most locations in Sonoma County, the PM peak traffic volume is greater than the AM peak. This is because the AM peak includes commute and school trips, while the PM peak includes commute trips, but also more shopping, personal errand, social, and recreational trips than the AM peak. As a result, if sufficient traffic capacity is provided to accommodate the PM peak hour, there would be sufficient capacity in the AM peak hour.

In **Exhibit 5.0-3** a directional orientation (e.g., "south or west") means in the southbound or westbound direction, depending on whether the roadway runs north-south or east-west. "Both" means "in both directions".

For purposes of this analysis, it was assumed that the No Project Alternative would not include those roadway improvements included in the *Draft GP 2020* beyond those that are committed, funded, and substantially underway. As a result there would be many more deficient roadway segments than with the *Draft GP 2020*.

In November 2004 voters in Sonoma County approved a one-quarter center sales tax for 20 years to partially fund specific highway and transportation improvements. The No Project Alternative does not assume that these projects would be constructed. However, if additional improvements identified in the No Project Alternative were funded and constructed, congestion would not likely be as significant as described below.

Exhibit 5.0-3
Roadways Experiencing Significant Impact in the PM Peak Hour with No Project Alternative

Roadway	*Direction*	*Baseline LOS*	*2020 LOS*
Adobe Rd west of Corona Rd	W	C	E
Airport Blvd East / Regional Parkway	Both	F/C	F/F
Arnold Drive			
north of Watmaugh Rd	N	B	D
north of Verano Ave	Both	C/B	F/E
Fulton Rd			
south of River Rd	Both	B/C	F/F
north of River Rd	Both	B/B	D/F
Lakeville Rd north of Highway 37	N	D	E
Main Street south of Adobe Rd (Penngrove)	S	B	D
Mark West Springs Rd east of Highway 101	Both	B/A	F/E
Old Redwood Highway			
south of Ursuline Rd	Both	E/A	F/F
north of Fulton Rd	N	B	F
north of Ely Rd	N	F	F
Petaluma Blvd N. north of Skillman Ln	N	C	E
Petaluma Hill Rd			
north of Roberts Rd	N	D	F
north of Snyder Ln	Both	D/B	F/F
Rohnert Park Expwy east of Stony Point Rd	W	D	F
Santa Rosa Ave north of Mountain View Ave	Both	F/B	F/F
Stony Point Rd			
north of Roblar Rd	N	C	E
north of Hwy 116	Both	A/A	D/D

Roadway	***Direction***	***Baseline LOS***	***2020 LOS***
north of Scenic Ave	Both	D/A	E/D
Highway 12			
north of Agua Caliente	S	B	E
north of Boyes Blvd	Both	D/C	F/F
Highway 12 (cont.) *east of Llano Rd*	Both	F/C	F/D
south of Verano Rd	Both	F/F	F/F
Highway 37			
west of Lakeville Hwy	E	E	F
between Lakeville Hwy and Hwy 121	E	B	D
east of Hwy 121	E	C	E
Highway 116			
east of Adobe Rd	E	D	F
west of Stony Point Rd	W	D	E
Highway 121 south of Hwy 116	N	C	D
US 101 [a]			
at Marin County Line	N	F/B	F
Cotati Grade north of ORH	Both	E/C	F/E
between Hwy 116 and Rohnert Park Expwy	Both	D/D	F/F
north of Wilfred Ave	Both	D/F	F/F
south of Hwy 12	Both	F/F	F/F
south of River Rd	Both	C/C	F/F
north of Airport Blvd	Both	C/B	F/F
north of Windsor River Rd	W	A/B	E

a US 101 Baseline (2000-2001) PM Peak Level of Service based on counts (Northbound/Southbound). This pre-dates the widening from Wilfred Avenue to Highway 12 that opened in November 2002.

Source: Dowling Associates, Inc., 2004

Impact 4.2-1 Congestion on Local County and City Roadway Segments

The No Project Alternative would result in significant impacts to local county and city roadway segments. A total of 20 county roadway segments would be deficient in the PM peak hour as compared to nine roadway segments for the *Draft GP 2020*. Several Sonoma Valley roadways, including Arnold Drive and Lakeville Road, would operate with deficient traffic service levels. Airport Boulevard would remain two lanes and would operate at a deficient traffic service level. Old Redwood Highway, Petaluma Hill Road, Adobe Road, Main Street and the Rohnert Park Expressway in the Penngrove area would be significantly congested. The primary reason for this increased congestion would be the relative lack of roadway and transit improvements compared to the *Draft GP 2020*. Also affecting this congestion would be the increased number of rural uses, such as churches, agricultural processing and agricultural tourism, and older lots resulting from Certificates of Compliance.

Impact 4.2-2 Congestion on State Highways

The No Project Alternative would result in a significant impact to State Highways. Under this alternative, ten State highway segments would be deficient in the PM peak hour compared to six highway segments for the *Draft GP 2020*. Sections of State Highway 12 (four segments), State Highway 37 (three segments), State Highway 116 (two segments) and one segment of State Highway 121 would be deficient in the PM peak hour. The reasons for this additional congestion under the No Project Alternative are the same as those described under *Impact 4.2-1 Congestion on Local County and City Roadway Segments*.

Impact 4.2-3 Congestion on Portions of US 101 in Several Areas between Cotati to North of Windsor

The No Project Alternative would result in a significant impact to portions of US 101 between Cotati and Windsor. Under this alternative, eight segments of US 101 would be deficient in the PM peak hour compared to five segments for the *Draft GP 2020*. The reasons for this additional congestion under the No Project Alternative are the same as those described under *Impact 4.2-1 Congestion on Local County and City Roadway Segments*.

Impact 4.2-4 Congestion at Key Intersections throughout the County

The No Project Alternative would result in a significant impact to key intersections throughout the county. As fewer transportation improvement projects would occur and projected growth in population would be the same as that of the *Draft GP 2020*, congestion at key intersections would be worse under the No Project Alternative than under the *Draft GP 2020*. The reasons for this additional congestion under the No Project Alternative are the same as those described under *Impact 4.2-1 Congestion on Local County and City Roadway Segments*.

Impact 4.2-5 Increased Demand for Transit Services

Unlike the *Draft GP 2020*, the increased demand for transit services would represent a significant impact under the No Project Alternative. This alternative assumes that there would be no initiation of the SMART passenger rail service. Therefore, the benefits associated with the SMART project would not occur. Bus transit ridership would be similar in the No Project Alternative as in the *Draft GP 2020*. Although traffic congestion would make buses slightly more attractive, buses would also experience delays similar to other motor vehicles. The primary reason for the increased transit demand is the relative lack of transit service compared to the *Draft GP 2020*.

Impact 4.2-6 Air Traffic Safety

Similar to the *Draft GP 2020*, the No Project Alternative would result in a less-than-significant impact related to air traffic safety. Air operations at Sonoma County airports would be subject to existing policies of the Airport Land Use Commission's *Comprehensive Airport Land Use Plan* as well as policies of the current Air Transportation Element which are the same as those of the *Draft GP 2020*. As a result, the impacts of the No Project Alternative with respect to air traffic safety would be the same as under the *Draft GP 2020*.

Impact 4.2-7 Conflict with Alternative Transportation

The No Project Alternative would result in a less-than-significant impact. Policies of the existing *General Plan* that would result in trip reduction through the promotion of alternative transportation methods (e.g., carpools, jobs – housing balance, consistency with local plans) would reduce conflicts with alternative transportation plans under the No Project Alternative. However, the *Draft GP 2020* includes additional policies that would be more effective in promoting non-vehicular modes of travel. As a result, the No Project Alternative would have a greater impact than *Draft GP 2020*, albeit it less-than-significant.

Impact 4.2-8 Lack of Parking Capacity or Emergency Access

Similar to the *Draft GP 2020* the No Project Alternative would result in a less-than-significant impact related to insufficient parking and emergency access. Applicable policies in the existing *General Plan* would be the same as those of the *Draft GP 2020.* Proposed projects would be subject to the Parking Standards in the Zoning Code and project review by County staff and local fire and emergency districts to assure adequate emergency access is provided. As a result, the impacts of this alternative would be the same as those under the *Draft GP 2020*.

Impact 4.2-9 Safety Risk from Transportation System Design

Similar to the *Draft GP 2020,* the No Project Alternative would result in a less-than-significant impact. Design of improvements to existing or new road and transit systems would be subject to County and State standards as well as the American Association of State Highway Transportation Officials (AASHTO) road classification system. As a result, the impacts of this alternative would be the same as those under the *Draft GP 2020*

AIR QUALITY

Exhibit 5.0-4 compares the relative levels of vehicle miles traveled (VMT) for the PM peak hour for the *Draft GP 2020* and each of the alternatives. [3]

Exhibit 5.0-4
Population and Vehicle Miles Traveled for Alternatives

General Plan Alternative	*Population*	*Percent Growth 2000 - 2020*	*Vehicle Miles Traveled (PM peak hour)*[a]	*Percent Growth 2000 - 2020*
Existing Conditions	128,596	–	1,078,000	–
Draft GP 2020	147,660	14.8	1,540,000	42.8
No Project Alternative	147,660	14.8	1,489,000	38.1
Buildout Alternative	175,992	36.8	2,048,000	90.0
Mitigated Alternative	147,660	14.8	1,545,000	43.3

a This is the number of vehicle miles traveled in the PM peak hour.

Source: Dowling Associates, Inc., 2004

Impact 4.3-1 Increased Emissions of Ozone Precursors

The No Project Alternative would result in a significant air quality impact from increased emissions of ozone precursors. As shown in **Exhibit 5.0-4** and explained in ***Section 4.2 Transportation***, VMT within Sonoma County would increase at a rate greater than population. With the No Project Alternative total VMT during the PM peak hour in Sonoma County would increase by 38 percent between 2000 and 2020, while population within the unincorporated portions of the county would increase 15 percent. Therefore, the No Project Alternative would result in emissions that are inconsistent with the Clean Air Plan for the BAAQMD and would also substantially increase the emission of ozone precursors in the remaining county area. While the existing *General Plan* includes some policies and programs that would support the Clean Air Plan Transportation Control Measures (TCMs), this alternative would not benefit from the new policies and programs proposed in the *Draft GP 2020*. Therefore, emissions of ozone precursors would be greater under the No Project Alternative than under the *Draft GP 2020.*

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[3] The VMT for the *Draft GP 2020* and Mitigated Alternative are effectively the same; the difference of 5,000 VMT/day is insignificant. The Mitigated Alternative used the "wish list" (Modeling Scenario #7), which has more roadway capacity than the *Draft GP 2020*. Adding roadway capacity has the potential to increase, or decrease, VMT, depending on the characteristics of the improvement. The traffic model assumes that motorists' objective in selecting a particular routes is to minimize time, not distance traveled. Thus, adding new road capacity can reduce VMT if people are able to use more direct, shorter distance routes between their origin and destination. On the other hand, VMT can be increased if motorists are attracted to a facility than now has higher speeds (usually a freeway), and are willing to travel not by the shortest distance route, but the shortest time. One of the strengths of a network-type model, like the one used in this study, is that the model can analyze both effects. This is important to correctly assess the air quality and energy impacts of road projects.

Impact 4.3-2 Increased Particulate Emissions

The No Project Alternative would result in a less-than-significant increase in particulate emissions. Wood burning stoves and construction activities would be subject to existing regulations which would ensure that these would be less-than-significant air quality impacts. However, since this alternative would result in more construction activities related to rural uses, it would result in a slightly greater level of particulates than would occur under the *Draft GP 2020*.

Impact 4.3-3 Exposure to Odors / Toxic Air Contaminants

The No Project Alternative would result in a significant impact with respect to these pollutants. Land uses and development consistent with this alternative could emit odors and toxic air contaminants that could affect nearby land uses. These land uses are likely to occur in both the No Project Alternative and the *Draft GP 2020*. As a result, the impact would be the same.

Impact 4.3-4 Exposure to Industrial Diesel Truck Emissions

Similar to the *Draft GP 2020* the No Project Alternative would result in a significant impact related to exposure to industrial diesel truck emissions. For the most part, land uses that would generate diesel truck emissions would be similar under the No Project Alternative and the *Draft GP 2020*. However, this alternative would experience more timber conversions and rural use and less roadway improvements. As a result, diesel truck emissions would be greater than under the *Draft GP 2020*.

Impact 4.3-5 Aircraft Emissions

As described in ***Section 4.3 Air Quality***, the No Project Alternative would result in a less-than-significant impact related to aircraft emissions. Since aircraft operations would be at the same levels as under the *Draft GP 2020*, the impacts would be the same as under the *Draft GP 2020*.

NOISE

Impact 4.4-1 Increased Traffic Noise

The No Project Alternative would result in a significant impact from increased traffic noise. Under this alternative, the projected increase in traffic over existing conditions would result in a significant increase in noise along certain roadway segments. Furthermore, due to the relative lack of transit improvement, the noise policies, and increased agricultural and other rural uses, traffic noise would be greater than under the *Draft GP 2020*.

Impact 4.4-2 Impact to Noise Sensitive Development from Roadway Noise

The No Project Alternative would result in a less-than-significant impact to new noise sensitive development from roadway noise. Under this alternative, increased traffic over existing conditions would result in increased noise along certain roadway segment thus exposing new sensitive receptors to roadway noise levels greater than those considered normally acceptable. However, Noise Element policies of the existing General Plan would reduce this impact to a less-than-significant level. Nonetheless, due to the reduced transit improvements, less stringent noise policies, and increased rural uses, the impact would be greater than under the *Draft GP 2020*.

Impact 4.4-3 Increased Rail Noise

The No Project Alternative assumes that there would be no initiation of the SMART passenger train service. Without SMART increased rail noise would be less than under the *Draft GP 2020* and result in a less-than-significant impact.

Impact 4.4-4 Impact to Noise Sensitive Development from Stationary Noise Sources

The No Project Alternative would result in a less-than-significant impact to noise sensitive development from stationary noise sources. Application of the noise standards in the existing *General Plan* would mitigate noise from stationary sources to acceptable levels, but the current standards of Table NE-2 are less stringent than the proposed standards in the *Draft GP 2020*. The current noise standards include a maximum noise level limit, and would, therefore, be more restrictive for very short noise events (less than one minute in an hour). With that exception, the No Project Alternative would allow noise levels from stationary sources to be slightly higher than those allowed by the *Draft GP 2020*. Therefore, this impact would be slightly greater than under the *Draft GP 2020*, albeit less-than-significant.

Impact 4.4-5 Airport Noise

There are no applicable policy differences between the No Project Alternative and the *Draft GP 2020*. Airport noise would continue to be mitigated by policies in the Air Transportation Element and compliance with the Airport Land Use Plan (see discussed in ***Section 4.4 Noise***). Therefore, the No Project Alternative would result in less-than-significant impact with respect to airport noise and this impact would be the same as under the *Draft GP 2020*.

HYDROLOGY AND WATER RESOURCES

Impact 4.5-1 Water Quality – Residential, Commercial, Industrial, and Public Uses

The No Project Alternative would result in a less-than-significant water quality impact from residential, commercial, industrial and public uses. Policies of the existing *General Plan* and current local stormwater and water quality control regulations (e.g., the application of Best Management Practices) would adequately mitigate construction-related water quality impacts, (for parameters other than soil erosion and sedimentation, discussed below) and post-construction impacts. However, the No Project Alternative would not result in the implementation of additional policies to protect water quality as would the *Draft GP 2020*. Such policies would emphasize an increased coordination between the Regional Water Quality Control Boards (RWQCBs) and NPDES stormwater and TMDL programs as well as place additional controls over agricultural processing uses. In addition, the No Project Alternative would include more agricultural and other rural uses which could result in a slight increase in water quality impacts. Therefore, water quality impacts from these uses would be relatively greater under this alternative than under the *Draft GP 2020*.

Impact 4.5-2 Water Quality – Soil Erosion and Sedimentation Related to Construction

The No Project Alternative would result in a less-than-significant water quality impact from soil erosion and sedimentation related to construction activities. Policies of the existing *General Plan* and current local stormwater and water quality control regulations (e.g., the development and implementation of Erosion Control Plans) would adequately mitigate construction-related impacts from soil erosion and sedimentation. However, the No Project Alternative would not result in the implementation of additional policies to protect water quality as would the *Draft GP 2020*. Such

policies would include requiring the preparation of an Erosion Control Ordinance as well as the increased involvement of the RWQCBs with water quality management programs. In addition, this alternative would result in more construction that could result in a slight increase in erosion and sedimentation. Therefore, soil erosion and sedimentation impacts to water quality from construction activities would be relatively greater under this alternative than under the *Draft GP 2020*.

Impact 4.5-3 Water Quality – Agricultural and Resource Uses

The No Project Alternative would result in a significant impact to water quality from agricultural and resource uses. Existing *General Plan* policies are less protective than those of the *Draft GP 2020*. Therefore, under this alternative, significant soil erosion problems would likely occur from agricultural cultivation (e.g., vineyards) or other resources development on steep slopes. Existing *General Plan* policies would also afford less protection from cumulative or watershed scale hydrologic impacts such as increased runoff from agricultural and resource development than would the *Draft GP 2020*. In addition, this alternative would result in more agricultural and other rural uses that could result in a slight increase in erosion and sedimentation. As a result, impacts to water quality from these uses would be relatively greater under the No Project Alternative than under the *Draft GP 2020*.

Impact 4.5-4 Water Quality – Wastewater Disposal

The No Project Alternative would result in a less-than-significant impact to water quality from wastewater disposal. Existing *General Plan* policies as well as current wastewater treatment and disposal regulations would adequately mitigate such impacts. However, the No Project Alternative would not benefit from additional protective policies such as an emphasized coordination with the RWQCBs in developing improved management practices. In addition, this alternative would result in more usage of package wastewater treatment plants in rural communities, which could result in a slight increase in water quality impacts from wastewater disposal as a consequence of future maintenance problems. Therefore, water quality impacts from wastewater disposal would be relatively greater under this alternative than under the *Draft GP 2020*.

Impact 4.5-5 Groundwater Level Decline

The No Project Alternative would result in a significant impact to groundwater resources. Existing and projected future declines in groundwater levels are expected to continue and perhaps worsen under this alternative. The extent and magnitude of groundwater level declines in some areas of the county are not well understood and the No Project Alternative would not benefit from *Draft GP 2020* programs that would improve groundwater monitoring, database development, and management practices. In addition, this alternative would result in more agricultural and other rural uses which could result in a slight increase in groundwater usage and groundwater level decline. Therefore, the No Project Alternative would result in relatively greater impacts to groundwater resources than would the *Draft GP 2020*.

Impact 4.5-6 Saltwater Intrusion

The No Project Alternative would result in a significant impact to groundwater resources from saltwater intrusion. Continuation of existing *General Plan* policies and County implementing rules and regulations would result in the continuation of current as well as potentially new saltwater intrusion impacts. The No Project Alternative would not benefit from *Draft GP 2020* programs that place a greater emphasis on well regulation and groundwater monitoring, including the possible development of groundwater management plans. In addition, this alternative would result in more agricultural and other rural uses which could result in a slight increase in saltwater intrusions.

Therefore the No Project Alternative would result in relatively greater impacts to groundwater resources from saltwater intrusion than would the *Draft GP 2020*.

Impact 4.5-7 Well Competition and Adverse Well Interference

The No Project Alternative would result in a significant impact to groundwater resources from well use. Existing localized problems involving well competition and well interference would continue to occur under this alternative and could worsen over time if competition for groundwater resources between users increases. The No Project Alternative would not include additional controls over well development beyond current policies and the existing well ordinance as would the *Draft GP 2020*. In addition, this alternative would result in more agricultural and other rural uses which could result in a slight increase in well competition and interference. Therefore the No Project Alternative would have relatively greater impacts to groundwater resources than would the *Draft GP 2020*.

Impact 4.5-8 Changes to Drainage Patterns Leading to Streambank Erosion

The No Project Alternative would result in a significant impact related to streambank erosion due to changes in drainage patterns. Land uses and development consistent with the existing *General Plan* would result in alternations to drainage patterns and consequently, localized bank instability problems that would not be fully mitigated by existing policies and County grading and drainage ordinances. The No Project Alternative would not result in the implementation of additional policies such as improved design guidelines and procedures. In addition, this alternative would result in more agricultural and other rural uses which could result in a slight increase in streambed erosion from changes in drainage patterns. Therefore the No Project Alternative would result in relatively greater streambank erosion impacts than would the *Draft GP 2020*.

Impact 4.5-9 Increased Flood Risk from Drainage System Alteration

The No Project Alternative would result in a less-than-significant impact related to increased flood risk. Existing *General Plan* policies, County drainage ordinances and design guidelines, and CEQA review of discretionary projects involving drainage alteration would continue to adequately reduce this impact. However, the No Project Alternative would not benefit from the development of additional controls including improved drainage design guidelines and procedures and the extension of the "No Net Fill" provision to all FEMA designated floodplains. In addition, this alternative would result in more agricultural and other rural uses which could result in a slight increase in flood risk from drainage alterations. Therefore the No Project Alternative would have relatively greater impacts related to flooding than would the *Draft GP 2020*.

Impact 4.5-10 Place Housing or Structures in 100-Year Flood Hazard Areas

The No Project Alternative would result in a less-than-significant impact related to 100-year flood hazards. Existing *General Plan* policies, the County ordinance requiring permits in 100-year floodplains, Sonoma County Water Agency design guidelines, and CEQA review of discretionary projects involving drainage alteration would continue to adequately reduce this impact. However, the No Project Alternative would not benefit from the development and implementation of additional controls including improved drainage design guidelines and procedures, the extension of the "No Net Fill" provision to all FEMA designated floodplains, or from strategies to reduce the incidence of flooding in repetitive flood damage areas of the county such as along the Russian River. Therefore the No Project Alternative would have relatively greater impacts related to flooding in 100-year flood hazard areas than would the *Draft GP 2020*.

Impact 4.5-11 Impede or Redirect Flows in Flood Hazard Areas

The No Project Alternative would result in a significant impact from flooding as a result of impeded or redirected flows in flood hazard areas. Land uses and development consistent with the existing *General Plan* could result in localized flooding problems caused by drainage alterations from grading activities that may not be fully mitigated by current policies and County grading and drainage ordinances. The No Project Alternative would not result in the implementation of additional controls such as improved drainage design guidelines and procedures. Therefore the No Project Alternative would have relatively greater impacts related to flooding than would the *Draft GP 2020*.

Impact 4.5-12 Failure of Levee or Dam

The No Project Alternative would result in a significant impact from flooding as a result of local levee or dam failure. Except for County built and maintained structures, dam and levee safety is not an area of County administrative authority but rather the responsibility of the agency that built these structures. Since there are no applicable policy differences in this area between the *Draft GP 2020* and the No Project Alternative, flooding impacts from dam and levee failure would be the same under each alternative.

BIOLOGICAL RESOURCES

Land uses and development consistent with the No Project Alternative could have significant impacts on sensitive biological resources. Sensitive resources include special-status species, sensitive natural communities, wetlands, and wildlife habitat. The existing *General Plan* also provides less protective measures such as riparian corridor protection, habitat management, resource education, and mitigation strategies than would the *Draft GP 2020*.

Impact 4.6-1 Special Status Species

The No Project Alternative would result in a significant impact to special-status species. Land uses and development consistent with the existing *General Plan* would extend over known occurrences of special-status plant and animal species, which could be adversely affected by grading and other disturbance. There remains a potential for additional loss of unknown populations of special-status species or loss of essential habitat for listed species as a result of activities which are not subject to County permit requirements. Objectives of the existing *General Plan* acknowledge the importance of adequately locating occurrences of special-status species in reviewing proposed development applications, but do not provide a process for updating the data base, recognize the regulatory authority of State and federal agencies, or establish minimum standards for mitigation. Because these updated policies of the *Draft GP 2020* would not apply, and because the No Project Alternative would result in more agricultural and other rural uses than the *Draft GP 2020*, potential impacts to special status species would be greater under this alternative.

Impact 4.6-2 Sensitive Natural Communities

The No Project Alternative would result in a significant impact to sensitive natural communities. Future land uses and development consistent with the existing *General Plan* would extend over known occurrences of sensitive natural communities, which could be adversely affected by grading and other disturbance. This includes substantial loss and modification to riparian habitat associated with intermittent and perennial streams, representing over 84 percent of the larger stream corridors in the county. Goals and policies in the existing General Plan address the protection and restoration of sensitive natural communities relate to oak woodlands, native trees, riparian corridors, the Laguna de

Santa Rosa, and the San Pablo Bay area. There are no provisions related to sensitive natural communities in general, or to several types of communities of particular importance in the county, such as vernal pools, freshwater marsh, brackish marsh, cypress stands, coastal bluff and dunes, and native grasslands, among others. There also remains a potential for additional loss of unknown occurrences as a result of activities which are not subject to County permit requirements. The impacts could be greater under the No Project Alternative in comparison to the *Draft GP 2020* because the lack of existing protections and the greater likelihood of agricultural and other rural uses affecting these communities.

Impact 4.6-3 Wetlands

Adverse changes to wetlands would represent a significant impact under the No Project Alternative. Mapped and designated resources represent a relatively small portion of the wetlands in the county and future land uses and development consistent with the existing *General Plan* could adversely affect known and unknown wetlands and associated habitat. Existing designated Riparian Corridors encompass a very small segment of the important aquatic and terrestrial habitat this network provides. Minimum building setbacks of 50 feet from wetlands called for in the existing *General Plan* may not be large enough in many cases to adequately function as a buffer. As with the issue of sensitive natural communities, the current policies would not adequately mitigate wetland impacts in spite of existing federal and State regulations. Therefore, the potential impacts on wetlands would be greater under this alternative than the *Draft GP 2020*.

Impact 4.6-4 Wildlife Habitat and Movement Opportunities

The No Project Alternative would result in a significant impact to wildlife habitat and movement opportunities. Under this alternative, urbanization, roadway expansion, habitat conversion, exclusionary fencing of vineyards and other factors would continue. Policies in the *Draft GP 2020* that would call for preparation of a comprehensive study to understand the issues of habitat connectivity in Sonoma County would not be implemented. In addition, this alternative would result in more agricultural and other rural uses which could result in a slight increase in impacts on wildlife habitat. Therefore, the impact to wildlife habitat and movement opportunities would be greater under this alternative than under the *Draft GP 2020*.

Impact 4.6-5 Conflict with Local Policies or Ordinances

The No Project Alternative would result in a less-than-significant impact. Future land uses and development would be consistent with the existing *General Plan* and, as with the *Draft GP 2020*, no conflicts with local policies or ordinances would be anticipated.

Impact 4.6-6 Conflict with Adopted Habitat or Natural Community Conservation Plans

No conservation plans have been adopted encompassing all or portions of Sonoma County. Therefore, similar to the *Draft GP 2020,* no impact would be anticipated under the No Project Alternative.

GEOLOGY AND SOILS

Impact 4.7-1 Seismic Ground Shaking

The No Project Alternative would result in a significant seismic ground shaking impact. Existing *General Plan* policies and regulations would reduce these impacts under this alternative. However, the No Project Alternative would not benefit from the additional policies of the *Draft GP 2020* that

would provide greater protection against loss or damage resulting from future seismic groundshaking, particularly during stronger events. In addition, this alternative would result in more agricultural and other rural uses which would result in a slight increase in structures at risk from earthquakes. Therefore, the No Project Alternative could result in relatively greater impacts from seismic groundshaking than would occur under the *Draft GP 2020*.

Impact 4.7-2 Seismic Related Ground Failure

The No Project Alternative would result in a significant seismic related ground failure impact. Policies and regulations of the existing *General Plan* would reduce these impacts under this alternative. However, the No Project Alternative would not benefit from the additional policies of the *Draft GP 2020* that would provide greater protection against loss or damage resulting from future ground failure during stronger seismic events. In addition, this alternative would include more agricultural and other rural uses which could result in a slight increase in structures at risk from earthquakes. Therefore, the No Project Alternative could result in relatively greater impacts from seismic related ground failure than would occur under *Draft GP 2020*.

Impact 4.7-3 Landsliding

The No Project Alternative would result in a significant landsliding impact. Policies and regulations of the existing *General Plan* would reduce these impacts under this alternative. However, the No Project Alternative would not benefit from the additional policies of the *Draft GP 2020* that would provide greater protection against loss or damage resulting from future landslides, particularly those related to heavier rainfall or stronger seismic events. In addition, this alternative would result in more agricultural and other rural uses which could result in a slight increase in structures at risk from landsliding. Therefore, the No Project Alternative would result in relatively greater impacts from landsliding than would occur under the *Draft GP 2020*.

Impact 4.7-4 Subsidence and Settlement

The No Project Alternative would result in a significant subsidence and settlement impact. Policies and regulations of the existing *General Plan* would reduce these impacts under this alternative. However, the No Project Alternative would not benefit from the additional policies of the *Draft GP 2020* that would provide greater protection against loss or damage resulting from future subsidence and settlement, particularly related to heavier rainfall or stronger seismic events. In addition, this alternative would include more agricultural and other rural uses which could result in a slight increase in structures at risk. Therefore, the No Project Alternative would result in relatively greater impacts from subsidence and settlement than would occur under the *Draft GP 2020*.

Impact 4.7-5 Tsunamis and Seiches

Existing policies would reduce many of the adverse effects related to tsunamis and seiches. However, the No Project Alternative could result in a significant impact to roads, public facilities, and other land uses and development from tsunamis and seiches. Policies and regulations of the existing *General Plan* would reduce these impacts under this alternative. However, the No Project Alternative would not benefit from the additional policies of the *Draft GP 2020* that would provide greater protection against loss or damage resulting from future seismic events which trigger tsunamis or seiches, particularly during stronger seismic events. In addition, this alternative would result in more agricultural and other rural uses which could result in a slight increase in structures at risk from tsunamis and seiches. Therefore, the No Project Alternative would result in relatively greater impacts from tsunamis and seiches than would occur under the *Draft GP 2020*.

Impact 4.7-6 Soil Erosion

The No Project Alternative would result in a significant soil erosion impact. Policies and regulations of the existing *General Plan* would reduce these impacts under this alternative. However, the No Project Alternative would not benefit from the additional policies of the *Draft GP 2020* that would provide greater protection against soil erosion triggered by future rainfall, particularly during heavier rainfalls. In addition, this alternative would result in more agricultural and other rural uses which could result in a slight increase in soil erosion. Therefore, the No Project Alternative would result in relatively greater impacts from soil erosion than would occur under the *Draft GP 2020*.

Impact 4.7-7 Expansive Soils

The No Project Alternative would result in a less-than-significant expansive soils impact. Policies and regulations of the existing *General Plan* would reduce these impacts under this alternative. However, the No Project Alternative would not benefit from the additional policies of the *Draft GP 2020* that would provide greater protection against loss or damage resulting from expansive soils. In addition, this alternative would result in more agricultural and other rural uses which could result in a slight increase in structures at risk from expansive soils. Therefore, although less-than-significant, the No Project Alternative would result in relatively greater impacts from expansive soils than would occur under the *Draft GP 2020*.

Impact 4.7-8 Septic Suitability of Soils

Similar to the *Draft GP 2020*, the No Project Alternative would result in a less-than-significant impact related to the septic suitability of soils. Land uses and development consistent with the existing *General Plan* could result in the use of septic systems or alternative wastewater systems on soils incapable of supporting their use. However, policies of the existing *General Plan*, applicable codes, and current engineering, structural design, and construction practices would reduce this impact to a less-than-significant level and this impact would be the same as under the *Draft GP 2020*.

Impact 4.7-9 Mineral Resources

Similar to the *Draft GP 2020*, the No Project Alternative would result in a less-than-significant impact to mineral resources. Policies of the existing *General Plan* as well as the County's *Aggregate Resource Management Plan* (ARM) would avoid the loss of availability of a known mineral resource. As a result, this impact would be the same as under the *Draft GP 2020*.

AGRICULTURAL AND TIMBER RESOURCES

Impact 4.8-1 Conversion of Agricultural Lands to Non-Agricultural Uses

The No Project Alternative would result in a less-than-significant impact to agricultural resources from conversion to non-agricultural uses. Under this alternative, conversion of agricultural land from annexation and development within the city and unincorporated USAs would be same as that would occur under the *Draft GP 2020*. Both the level of population growth and the boundaries of the unincorporated Urban Service Areas (USAs) would be the same as those under the proposed project. Existing policies that promote Sonoma County's agricultural products, stabilize the urban fringe, limit the intrusion of residential uses into agricultural areas are largely unchanged by the *Draft GP 2020* and would protect most agricultural lands from conversion to non-agricultural uses. Some additional rural uses such as churches and energy facilities might occur under this alternative. Lots recognized through Certificates of Compliance might also be greater, resulting in additional development on

agricultural lands. Notwithstanding this increase, proposed policies of the *Draft GP 2020* that would limit agricultural uses in approximately 61,000 acres in setbacks adjacent to riparian corridors would not be implemented. Therefore, relative to the *Draft GP 2020,* the No Project Alternative would result in less conversion of agricultural land to non-agricultural uses.

Impact 4.8-2 Agricultural Processing and Support Uses

The No Project Alternative would result in a less-than-significant impact related to the loss of productive agricultural land to processing and support uses. The same amount of cultivation would occur as under the *Draft GP 2020*. Agricultural processing and support uses would be strongly encouraged if related to and supportive of local agricultural production. However, such uses would not be regulated as strictly under the No Project Alternative as they would be by proposed policies of the *Draft GP 2020*. Policies that would avoid over-concentration of these uses would also not be implemented. Therefore, the loss of agricultural production to processing and support uses under the No Project Alternative would likely surpass the level under the *Draft GP 2020.*

Impact 4.8-3 Agricultural Tourism

The No Project Alternative would result in a less-than-significant impact related to the conversion of agricultural land to agricultural tourism uses. Such uses would not be regulated as strictly under this alternative as they would be under the *Draft GP 2020*. Special events at such uses would be allowed but not coordinated to avoid secondary impacts. This alternative would likely result in more development of and impacts from agricultural tourism uses compared to the *Draft GP 2020.*

Impact 4.8-4 Timberland Conversion

The No Project Alternative would result in a less-than-significant impact to timber resources. Under this alternative, timberland conversions to non-timber uses would continue to occur. Accordingly, given current trends which indicate an increase in timberland conversion requests, the No Project Alternative would result in a greater amount of timberland conversion relative to the proposed project. While quantifying such conversion in the future would be speculative, both current and projected trends for conversion to non-timber uses would represents less than one percent of the total land in timber production, a less-than-significant amount.

PUBLIC SERVICES

Impact 4.9-1 Insufficient Water Supplies to Meet the Future Water Demand of the Urban Service Areas

The No Project Alternative would result in a significant impact to water supplies. Currently, there is not enough information to conclude that sufficient water would be available to meet the future demand of land uses and development consistent with the existing *General Plan* in all Urban Service Areas (USAs). The No Project Alternative would not include policies that place a greater emphasis on coordinated water supply planning, increased conservation, and water supply protection. However, the No Project Alternative also would not result in additional affordable housing sites or other proposed land use changes that would increase urban water demand. Therefore, future water demand in these areas would be slightly less under the No Project Alternative than under the *Draft GP 2020*.

Impact 4.9-2 Insufficient Water Supplies to Meet the Future Water Demand of Rural Private Domestic, Small Municipal, and Agricultural Wells

The No Project Alternative would result in a significant impact to well water supplies. As in the previous impact, there is currently not enough information about groundwater to conclude that sufficient water would be available to meet the future water demand of all private domestic, small-municipal, and agricultural wells in rural areas. The No Project Alternative would not include policies that place a greater emphasis on coordinated water supply planning, and increased well monitoring and regulation. In addition, this alternative would result in more agricultural and other rural uses that would result in greater demand for water. Therefore, potential deficiencies in future groundwater supply to rural well users would be greater under the No Project Alternative than under the *Draft GP 2020*.

Impact 4.9-3 New or Expanded Water Supply Facilities

The No Project Alternative would result in a significant impact to existing water supply and water treatment facilities. As noted above, this alternative could generate local water demands less than, equal to, or greater than that of the *Draft GP 2020* depending on the location. Such demand may exceed the supply capacity of several public water districts and private water companies and require new or expanded water supply facilities, the construction of which could result in secondary construction-related impacts that may be greater than under the *Draft GP 2020*, depending upon the water supply location.

Impact 4.9-4 Increased Wastewater Treatment Demand

The No Project Alternative would result in a significant impact to wastewater services due to the uncertain feasibility of adding or expanding services to meet demand under this alternative. Policies of the existing *General Plan* would support master planning for sanitation districts, limit the extension of services beyond USAs and limit the use of package wastewater treatment plants in rural areas. In addition, while the No Project Alternative would result in the same overall level of unincorporated population and housing growth as the proposed project, there would be less affordable housing sites, less land use changes, and less rural uses on package treatment plants that would generate wastewater flows. As a result, demand for wastewater services would be slightly less under this alternative.

Impact 4.9-5 New or Expanded Wastewater Facilities

Similar to the *Draft GP 2020*, the No Project Alternative would result in a significant impact. As described in *Impact 4.9-4 Increased Wastewater Treatment Demand*, increased wastewater flows generated by the No Project Alternative would necessitate new or expanded wastewater treatment facilities. The construction of such facilities could result in secondary construction-related impacts that would be similar to those under the *Draft GP 2020*.

Impact 4.9-6 Increased Solid Waste Disposal Demand

Similar to the *Draft GP 2020*, the No Project Alternative would result in a significant impact to solid waste disposal services. Under this alternative, the Sonoma County Integrated Waste Management Plan (CoIWMP) would remain the principal planning document for solid waste management in Sonoma County. As unincorporated population and housing growth would be the same as that of the proposed project, the No Project Alternative would generate a solid waste stream similar in amount to that of the *Draft GP 2020*.

There is uncertainty in regards to future solid waste disposal capacity as discussed in ***Section 4.9 Public Services***. Delays in the Central Landfill expansion project will require the closure and transportation of solid waste to sites outside the county for several years. Following completion of this project, the Central Landfill is expected to have adequate capacity to serve Sonoma County's solid waste disposal needs until 2015. Additional projects recommended in the CoIWMP may provide sufficient capacity until 2050; however, it is uncertain if such projects are feasible. This impact would be similar to that of the *Draft GP 2020.*

Impact 4.9-7 Increased Demand for Parks and Recreation Services and Facilities

Similar to the *Draft GP 2020*, the No Project Alternative would result in a significant impact to parks and recreation services and facilities. Unincorporated population growth consistent with the No Project Alternative would result in the same deficiencies in parks and recreation services as that of the *Draft GP 2020*. While full implementation of an Outdoor Recreation Plan could result in the development of parks and recreational facilities sufficient to meet the park planning guidelines, there is no guarantee that such actions would occur due to funding uncertainties. In addition, development of required park and recreation projects could result in a number of similar impacts to the environment from construction related activities as under the *Draft GP 2020*.

Impact 4.9-8 Demand for Public Education Services and Facilities

The No Project Alternative would result in a less-than-significant impact to public education services and facilities. Applicable policies of the existing *General Plan* would be the same as those of the *Draft GP 2020* and generally provide that such facilities be planned, designed, and constructed in accordance with projected growth. Therefore, as population and housing growth under the No Project Alternative would be the same as that of the *Draft GP 2020*, enrollments would continue to decline in a similar manner as discussed in ***Section 4.9 Public Services***.

Impact 4.9-9 Increased Demand for Fire Protection and Emergency Services Facilities

The No Project Alternative would result in a significant impact to public fire protection and emergency services facilities. Policies of the existing *General Plan* related to fire protection services are the same as those of the *Draft GP 2020* and generally provide that such facilities be planned, designed, and constructed in accordance with projected growth. Current funding trends will likely result in the reduction of the number of volunteer fire companies within the unincorporated area. Since the No project Alternative would include additional agricultural and other rural uses, development consistent with this alternative could require more new or expanded fire protection and emergency services facilities, the construction of which could result in greater secondary construction-related impacts than under the *Draft GP 2020*.

Impact 4.9-10 Wildland Fire Hazards

The No Project Alternative would result in a significant impact related to wildland fire hazards. Policies of the existing *General Plan* would reduce these hazards to a degree, but the absence of the *Draft GP 2020* policies such as improving the street addressing system and the additional agricultural and other rural uses anticipated under this alternative would result in a greater impact than under the *Draft GP 2020*.

Impact 4.9-11 Demand for Additional Criminal Justice Facilities

Similar to the *Draft GP 2020*, the No Project Alternative would result in a significant impact to criminal justice facilities. Population growth in the unincorporated area consistent with the No Project

Alternative would result in a Sheriff's Department service level ratio in 2020 similar to that of the proposed project or approximately 1.19 deputies per 1,000 persons. In addition, development consistent with this alternative would result in the demand for new or expanded Sheriff's Department substations and detention facilities, the construction of which could result in significant environmental impacts. These impacts would be the same as under the *Draft GP 2020*.

Impact 4.9-12 Increased Demand for Library Facilities

Similar to the *Draft GP 2020*, the No Project Alternative would result in a significant impact to library facilities. Neither the existing *General Plan* nor the *Draft GP 2020* contains policies applicable to library services. Similar to the proposed project, population growth consistent with the No Project Alternative would require new or expanded County Library facilities in order to maintain acceptable service ratios. The construction of these facilities could result in significant environmental impacts. These impacts would be the same as under the *Draft GP 2020*.

Impact 4.9-13 Increased Demand for Human Services Facilities

The existing *General Plan* contains no policies related to human services. Development consistent with the No Project Alternative could exceed the ability of the County's Human Services Department to maintain an acceptable level of service within its present level of funding and facilities. The increased demand could result in the need for new or expanded human services facilities, the construction of which could result in significant environmental impacts. These impacts would be the same as under the *Draft GP 2020*.

CULTURAL RESOURCES

Impact 4.10-1 Historic Resources

The No Project Alternative would result in a significant impact to historic resources. Continued development consistent with the existing *General Plan* could result in the disturbance of historic resources summarized in **Exhibit 4.10-1**. The Landmarks Commission would maintain review and approval granting authority for any alterations to structures on sites zoned Historical District (HD) as well as requiring such alterations to meet adopted design standards. Impacts to undesignated historical resources from building or other ministerial permits could be significant. In addition, a new ordinance requiring that Unreinforced Masonry Buildings (UMBs) be strengthened and / or reinforced would not be considered as it would under the *Draft GP 2020*. Therefore impacts to historic resources would be relatively greater under the No Project Alternative than under the *Draft GP 2020*.

Impact 4.10-2 Archeological and Paleontological Resources and Human Remains

The No Project Alternative would result in a significant impact to archeological and paleontological resources. Continued development consistent with the existing *General Plan* could result in the disturbance of subsurface archeological and paleontological resources as well as human remains. In addition, while existing policies and procedures (i.e., Northwest Information Center referrals) would likely protect documented archeological and / or paleontological resources, they may not adequately protect previously unidentified resources. Furthermore, ministerial projects and land use activities not subject to permits (e.g., agricultural cultivation, single family dwellings on existing lots) could disturb such resources as well. Since there would likely be more agricultural and other rural uses under this alternative, such impacts would be slightly greater than those under the *Draft GP 2020*.

VISUAL RESOURCES

Impact 4.11-1 Community Separators, Scenic Landscape Units, Scenic Corridors, and Scenic Highways

The No Project Alternative would result in less-than-significant visual impacts within Community Separators, Scenic Landscape Units, Scenic Corridors, and Scenic Highways.

The No Project Alternative would afford a similar level of protection to the integrity of Community Separators as would the *Draft GP 2020*. Development within Community Separators would continue to be maintained at low densities and required to address visual impacts. Existing ordinances requiring voter approved changes to the boundaries, land use designations, and densities would continue to assure that Community Separators would not be reduced in size. Some reductions in acreage to Community Separators would still occur due to annexations by various cities, but these reductions reflect existing circumstances and would not be the result of the *Draft GP 2020*.

The No Project Alternative would not result in the extensions of Scenic Landscape Units boundaries to extend up to and over the crests of hills and ridges as proposed in the *Draft GP 2020.* As a result, the policies of the existing *General Plan* would afford less protection to the scenic quality of these lands compared with those of the *Draft GP 2020*.

With respect to Scenic Corridors and Scenic Highways, the impact of continued development consistent with the existing *General Plan* would be similar to that of the *Draft GP 2020* as it proposes no applicable policy changes.

The design standards of the existing *General Plan* would be slightly less-restrictive than those of the *Draft GP 2020* for new development within Community Separators and Scenic Landscape Units. Relative to the *Draft GP 2020,* there may be more agricultural processing, agricultural tourism, churches, and other rural uses that occur within these areas. Therefore, the No Project Alternative would result in greater visual impacts in these areas than under the *Draft GP 2020*.

However, policies of the existing *General Plan* would continue to protect designated Community Separators and Scenic Landscape Units with standards which provide for siting and screening of structures from public roads in substantially the same manner as under the *Draft GP 2020*. Community Separator boundaries, which provide visual separation between and containment around urban areas, are specifically designated on the Open Space maps and would not change. As a result, while the impacts on visual resources would be greater under the No Project Alternative, they would remain less-than-significant.

Impact 4.11-2 Visual Impacts in Other Urban and Rural Areas

Unlike the *Draft GP 2020*, adverse changes to the visual quality in urban and rural areas would represent a significant impact under the No Project Alternative. Not only would these areas not benefit from the proposed urban design and rural character policies of the *Draft GP 2020*, there would be more agricultural and other rural uses associated with this alternative. As a result, visual impacts would be greater than under the *Draft GP 2020*.

4.11-3 Light Pollution and Nighttime Sky

The No Project Alternative would result in a significant visual impact related to light pollution and the nighttime sky. Although discretionary project review allows for mitigation of light pollution for some projects, the existing *General Plan* contains no policies that specifically address light and glare issues,

particularly for ministerial permits or land uses not requiring permits. In addition, more agriculture and other rural uses would likely occur under this alternative. Therefore, continued development consistent with the existing *General Plan* would result in relatively greater impacts to the nighttime sky as a result of outdoor lighting (e.g., light trespass, light pollution, and sky glow) than would occur under the *Draft GP 2020*.

ENERGY

Impact 4.12-1 Energy Consumption from Land Use Locations and Patterns

Similar to the *Draft GP 2020*, the No Project Alternative would result in a less-than-significant impact related to energy consumption from land use locations and patterns. Under this alternative, the existing *General Plan* land use map would continue to focus future development in a compact manner within or adjacent to existing developed areas. Development which directly supports agricultural production would continue to be located in agricultural areas. This land use pattern would reduce the future reliance upon single occupancy vehicles, a major user of energy. As a result, land use patterns consistent with the No Project Alternative would not result in wasteful, inefficient, and unnecessary consumption of energy. Therefore, energy consumption as a consequence of land use patterns would be the same as under the *Draft GP 2020.*

Impact 4.12-2 Energy Consumption from Building Construction and Retrofit

The No Project Alternative would result in a less-than-significant impact related to energy consumption from building construction and retrofit due primarily to the effectiveness of current building codes and energy reduction programs. Relative to the *Draft GP 2020,* there would likely be a slightly greater amount of construction of new buildings that would require energy for daily operation. Policies of the *Draft GP 2020* that would call for greater energy efficient construction would not apply. As a result, energy consumption impacts would be greater under this alternative.

Impact 4.12-3 Increased Energy Demand and Need for Additional Energy Resources

The No Project Alternative would result in a significant impact related to increased energy demand and need for additional energy resources. Under this alternative, the increased demand for energy resources through 2020 would be similar to that of the proposed project in that unincorporated population growth and development would be similar. The existing *General Plan* does not contain policies promoting small-scale decentralized power generation and renewable energy as does the *Draft GP 2020*. The No Project Alternative would not be as effective in stabilizing regional power supply and diversifying energy production methods as the *Draft GP 2020* through its policies that would encourage such energy projects. Energy usage and demand would continue to increase as a consequence of future growth, additional agricultural and rural uses, and because automobile travel would continue for some time to be the travel mode of choice.

The No Project Alternative would not include the SMART passenger rail project and widening of highways sufficient to achieve mobility. Lack of this major transit facility would result in an increase in automobile and bus travel and, consequently, Vehicle Miles Traveled. Increases in this method of travel would lead to a greater level of energy consumption countywide. Similarly, increased congestion during peak hours could result in slower speeds and more stop-and-go starts, increasing energy consumption. As a result, the need for additional energy resources would be greater under this alternative than under the *Draft GP 2020*.

HAZARDOUS MATERIALS

Impact 4.13-1 Release of Hazardous Materials

The No Project Alternative would result in a less-than-significant impact related to the release of hazardous materials. Land uses and development consistent with this No alternative would result in the transport, use, and disposal, of hazardous materials, which could result in the exposure of the public to such materials either through their routine use or due to accidental release. Similar to the proposed project, policies of the existing *General Plan* would help reduce the potential for hazardous materials release as well as reduce the potential for damage or loss in the event of such a release. However, the use of hazardous materials would likely be greater under the No Project Alternative and would not include policies promoting alternatives to pesticide use, including use for County operations. As a result, the impacts of this alternative would be slightly greater than under the *Draft GP 2020*.

Impact 4.13-2 Hazardous Materials, Substances, or Waste near School Sites

The No Project Alternative would result in a significant impact related to hazardous materials, substances, and / or waste near school sites. As noted in *Impact 4.13-1 Release of Hazardous Materials*, land uses and development consistent with this alternative could result in increased use of hazardous materials in the vicinity of school sites as compared to the *Draft GP 2020* and therefore result in a slightly greater impact.

Impact 4.13-3 Hazardous Material near Airports

The No Project Alternative would result in a less-than-significant impact related to hazardous materials near airports. Discretionary review of projects as well as compliance with the *Comprehensive Airport Land Use Plan* (CALUP) would ensure that this impact would be reduced to a less-than-significant level. As noted above under *Impact 4.13-1 Release of Hazardous Materials*, this alternative could result in increased use of hazardous materials as compared to the *Draft GP 2020* and therefore result in a slightly greater impact.

5.3 – ALTERNATIVE 2 BUILDOUT ALTERNATIVE

The Buildout Alternative represents a scenario in which each parcel in the unincorporated portion of Sonoma County would be developed to the maximum extent permitted by the parcel's land use designation. Although this level of development is not projected to occur by the County or regional and State agencies, it would result in population and household growth approximately 19 percent higher than that of the *Draft GP 2020*. Additionally, 30 percent more agricultural cultivation primarily vineyard development would occur under this alternative. Similar to the proposed project, this alternative would include the Federated Indians of Graton Rancheria's casino near Rohnert Park.

In general, the policy choices assumed to be made under this alternative would be less restrictive than those under the proposed project or any of the other alternatives. The policies assumed under these alternatives are described in ***Section 5.1 Description of Alternatives***.

Analysis of Buildout Alternative

LAND USE, POPULATION, AND HOUSING

Impact 4.1-1 Growth and Concentration of Population

Unlike the *Draft GP 2020*, growth and concentration of population would represent a significant impact under the Buildout Alternative. Under this alternative, goals, objectives, and policies of the existing *General Plan* related to city and community centered growth and stabilization of agricultural use at the urban fringe would be the same as those of the No Project Alternative and similar to those of the *Draft GP 2020*. However, this alternative would result in the expansion of existing Urban Service Boundaries (USBs) compared to the proposed project. It would also include all of the proposed land use requests, more resorts, and more agricultural and other rural uses. Policies regulating sewer service would allow increased use of package wastewater treatment plants which would allow new uses to be permitted and constructed that would otherwise not occur with standard septic systems.

As a result of these and other policies, unincorporated population and household growth would be approximately 19 percent higher than of that proposed by the *Draft GP 2020*. Such growth would be inconsistent with ABAG projections.

Impact 4.1-2 Land Use Conflicts between Agricultural and Residential / Urban Uses

The Buildout Alternative would result in a significant impact related to land use conflicts between agricultural and residential urban uses. Policies designed to reduce agricultural and urban land use conflicts by limiting the intrusion of new residential uses into agricultural areas as well as mitigating conflicts between such uses in designated agricultural production areas, would be the same as those of the *Draft GP 2020*. In addition, the Sonoma County Right to Farm Ordinance would continue to support the existing *General Plan* policies, educate the public about agricultural operations and their importance, as well as reduce land use conflicts between agricultural and urban neighbors. However, relative to the proposed project, this alternative would result in the expansion of existing USBs. This alternative would also see an increase in residences and such uses as churches and schools in agricultural areas, resulting in a substantially greater intrusion of non-agricultural uses into agricultural production areas. As a result, these impacts would be greater under this alternative than under the *Draft GP 2020.*

Impact 4.1-3 Incompatible Land Uses in the Rural Area

Similar to the *Draft GP 2020,* the Buildout Alternative would result in a significant impact related to incompatible land uses in rural areas. The development of agricultural processing, agricultural tourism, and rural other uses such as churches and schools would be greater than the proposed project. In addition, agricultural uses would be more prevalent on Rural Residential lands. As a result, these impacts would be greater under this alternative than under the *Draft GP 2020*.

Impact 4.1-4 Affordable Housing

Similar to the *Draft GP 2020,* the Buildout Alternative would result in a less-than-significant impact resulting from the development of affordable housing projects. This alternative would result in development of Affordable Housing projects as proposed in the *Draft GP 2020*. Impacts resulting from such land use conflicts could be reduced to a less-than-significant level through discretionary

project review. As a result, impacts under this alternative would be similar to those of the proposed project.

TRANSPORTATION

As discussed in ***Section 4.2 Transportation***, to identify potential levels of traffic impacts, a traffic analysis for the Buildout Alternative was performed using a computer-based traffic model. **Exhibit 5.0-5** shows those roadways that would have a significant impact in 2020 in the PM peak hour based on adoption and implementation of the Buildout Alternative. This analysis uses the same thresholds of significance as used in ***Section 4.2 Transportation***.

In **Exhibit 5.0-5** a directional orientation (e.g., as "S" or "W") means in the southbound or westbound direction, depending on whether the roadway runs north-south or east-west. "Both" means "in both directions".

Exhibit 5.0-5
Roadways Experiencing Significant Impact in the PM Peak Hour with Buildout Alternative

Roadway	*Direction*	*Baseline LOS*	*2020 LOS*
Adobe Rd			
west of Corona Rd	Both	A/C	E/F
east of E. Washington St	Both	A/B	D/F
east of Frates Rd	Both	A/A	E/E
Airport Blvd East / Regional Parkway	Both	F/C	F/F
Arnold Drive			
north of Watmaugh Rd	Both	B/A	F/E
north of Verano Ave	Both	C/B	F/F
Bennett Valley Rd west of Grange Rd	E	A	D
East Cotati Ave west of Petaluma Hill Rd	Both	A/A	D/F
Fulton Rd			
south of River Rd	Both	B/C	F/F
north of River Rd	Both	B/B	F/F
Guerneville Rd			
east of Frei Rd	W	A	F
east of Vine Hill Rd	W	A	E
Lakeville Rd north of Highway 37	N	D	F
Main Street south of Adobe Rd (Penngrove)	Both	F/B	F/F
Mark West Springs Rd east of Highway 101	Both	B/A	F/F

Roadway	***Direction***	***Baseline LOS***	***2020 LOS***
Occidental Rd west of Sanford Rd	W	C	D
Old Redwood Highway			
south of Ursuline Rd	Both	E/A	F/F
north of Fulton Rd	Both	B/A	F/F
north of Ely Rd	Both	F/B	F/E
Petaluma Ave east of Arnold Drive	W	A	D
Petaluma Blvd N. north of Skillman Ln	Both	C/B	F/F
Petaluma Hill Rd			
north of Roberts Rd	Both	D/A	F/F
north of Snyder Ln	Both	D/B	F/F
River Rd			
west of Mirabel Rd	W	B	E
between Olivet Rd and Slusser Rd	W	A	E
west of Fulton Road	W	A	F
Riverside Dr north of Hwy 12	Both	B/B	F/D
Rohnert Park Expwy east of Stony Point Rd	Both	B/D	D/F
Santa Rosa Ave north of Mountain View Ave	Both	F/B	F/F
Skylane Blvd north of Airport Blvd	N	A	F
Snyder Ln south of Petaluma Hill Rd	S	A	F
Stony Point Rd			
south of Mecham Rd	N	B	E
north of Roblar Rd	Both	C/A	F/D
north of Hwy 116	Both	A/A	F/F
north of Scenic Ave	Both	D/A	F/F
Verano Ave west of Hwy 12	Both	B/C	D/F
Highway 12			
south of Warm Springs Rd	N	A	E
north of Agua Calienta	Both	A/B	F/F
north of Boyes Blvd	Both	D/C	F/F
east of Llano Rd	Both	F/C	F/E
south of Verano Rd	Both	F/F	F/F
Highway 37			
west of Lakeville Hwy	E	E	F

Roadway	***Direction***	***Baseline LOS***	***2020 LOS***
Highway 37 (cont.) *between Lakeville Hwy and Hwy 121*	E	B	E
east of Hwy 121	Both	C/A	F/D
Highway 116			
east of Adobe Rd	Both	D/B	F/F
south of Occidental Rd	N	A	D
west of Stony Point Rd	W	D	F
Highway 121 south of Hwy 116	N	C	E
US 101 [a]			
at Marin County Line	N	F/B	F
Cotati Grade north of ORH	Both	E/C	F/E
between Hwy 116 and Rohnert Park Expwy	Both	D/D	F/F
north of Wilfred Ave	Both	D/F	F/F
south of Hwy 12	Both	F/F	F/F
south of River Rd	Both	C/C	F/F
north of Airport Blvd	Both	C/B	F/F
north of Windsor River Rd	S	A/B	E

a US 101 Baseline (2000-2001) PM Peak Level of Service based on counts (Northbound/Southbound). This pre-dates the widening from Wilfred Avenue to Highway 12 that opened in November 2002.

Source: Dowling Associates, Inc., 2004.

The Buildout Alternative assumes the same limited number of transportation improvements as the No Project Alternative, but assumes more development in the unincorporated area of Sonoma County. The Buildout Alternative does not include those roadway and transit improvements included under the *Draft GP 2020* beyond those that have committed funding and are substantially underway. To isolate only the impacts of changes to land uses in the unincorporated county, buildout was assumed in the county, but not in the cities (rather, city general plan land uses were used).

As shown in **Exhibit 5.0-5**, 56 roadway segments would be deficient in the PM peak hour. Increases in commuting by residents of other counties to Sonoma County jobs would greatly exacerbate traffic congestion at key "gateways" to the county, especially US 101, State Highways 37 and 12 / 121, and Calistoga Road.

Impact 4.2-1 Congestion on Local County and City Roadway Segments

The Buildout Alternative would result in significant impacts to local county and city roadway segments. Under this alternative, a total of 36 county roadway segments would be deficient in the PM peak hour as compared to nine roadway segments for the *Draft GP 2020*. In addition to the congested roadway segments identified for the No Project Alternative, additional congestion would occur in the following areas:

- Additional segments of Adobe Road (in fact, nearly its entire length)
- Bennett Valley Road
- East Cotati Avenue
- Guerneville Road
- Petaluma Avenue (Sonoma)
- River Road (Fulton/Hacienda)
- Riverside Drive (Sonoma)
- Skylane Boulevard (Airport)
- Verano Avenue (Sonoma)

The primary reason for this increased congestion would be the relative lack of roadway and transit improvements compared to the *Draft GP 2020*. Also affecting this congestion would be the additional urban and rural development that would occur under this alternative.

Impact 4.2-2 Congestion on State Highways

The Buildout Alternative would result in a significant impact to State Highways. Under this alternative, 12 roadway segments of State highways would be deficient in the PM peak hour compared to six roadway segments for the *Draft GP 2020*. In addition to the State highways identified in the No Project Alternative, additional congestion would occur in the Buildout Alternative on State Highway 12 south of Warm Springs Road and State Highway 116 south of Occidental Road. The reasons for this additional congestion under the Buildout Alternative are the same as those described above under *Impact 4.2-1 Congestion on Local County and City Roadway Segments*.

Impact 4.2-3 Congestion on Portions of US 101 in Several Areas between Cotati to North of Windsor

The Buildout Alternative would result in a significant impact to portions of US 101 between Cotati and Windsor. Under this alternative, eight segments of US 101 would be deficient in the PM peak hour compared to five segments for the *Draft GP 2020*. In the Buildout Alternative, the US 101 deficient segments would be the same as in the No Project Alternative. These roadway segments would not benefit from traffic improvement projects associated with the *Draft GP 2020* and would experience traffic from additional development projected under this alternative.

Impact 4.2-4 Congestion at Key Intersections throughout the County

The Buildout Alternative would result in a significant impact to key intersections throughout the county. As less transportation improvement projects would occur and projected growth in population would be greater than that of the *Draft GP 2020*, congestion at key intersections would be worse under the Buildout Alternative than under the *Draft GP 2020* for the reasons described above under *Impact 4.2-1 Congestion on Local County and City Roadway Segments*.

Impact 4.2-5 Increased Demand for Transit Services

Unlike the *Draft GP 2020,* the Buildout Alternative would result in a significant impact to transit services. This alternative assumes that there would be no initiation of the SMART passenger rail service. Therefore, the reduction in roadway congestion associated with the SMART project would not occur. Bus transit ridership would be similar in the Buildout Alternative as in the *Draft GP 2020*. With more employment than the *Draft GP 2020*, this alternative may have some increased transit ridership to and from areas of job concentrations. Although traffic congestion would make buses slightly more attractive, buses would also experience the same delays as other motor vehicles. However, the lack of a passenger rail system combined with additional development would result in an overall greater impact to transit services under this alternative.

Impact 4.2-6 Air Traffic Safety

Similar to the *Draft GP 2020*, the Buildout Alternative would result in a less-than-significant impact related to air traffic safety. Under this alternative, air operations at Sonoma County airports would be subject to existing policies of the Airport Land Use Commission's *Comprehensive Airport Land Use Plan* as well as policies of the current Air Transportation Element which would be the same as those of the *Draft GP 2020.* As a result, the impacts of this alternative would be the same as under the *Draft GP 2020*.

Impact 4.2-7 Conflict with Alternative Transportation

The Buildout Alternative would result in a less-than-significant impact. Policies of the existing *General Plan* that would result in trip reduction through the promotion of alternative transportation methods (e.g., carpools, jobs – housing balance, consistency with local plans) would reduce conflicts with alternative transportation plans under the Buildout Alternative. However, the *Draft GP 2020* includes additional policies that would be more effective in promoting non-vehicular modes of travel. As a result, the Buildout Alternative would have a greater impact than the *Draft GP 2020*.

Impact 4.2-8 Lack of Parking Capacity or Emergency Access

Similar to the *Draft GP 2020* the Buildout Alternative would result in a less-than-significant impact related to insufficient parking and emergency access. Applicable policies in the existing *General Plan* would be the same as those of the *Draft GP 2020.* Proposed projects would be subject to the Parking Standards in the Zoning Code and project review by County staff and local fire and emergency districts to assure adequate emergency access is provided. As a result, the impacts of this alternative would be the same as those under the *Draft GP 2020*.

Impact 4.2-9 Safety Risk from Transportation System Design

Similar to the *Draft GP 2020,* the Buildout Alternative would result in a less-than-significant impact. Design of improvements to existing or new road and transit systems would be subject to County and State standards as well as the American Association of State Highway Transportation Officials (AASHTO) road classification system. As a result, the impacts of this alternative would be the same as those under the *Draft GP 2020*.

AIR QUALITY

Impact 4.3-1 Increased Emissions of Ozone Precursors

The Buildout Alternative would result in a significant air quality impact from increased emissions of ozone precursors. This alternative would result in higher population growth than the *Draft GP 2020* and therefore may be inconsistent with the ABAG population projections that are used in the regional Clean Air Plan within the BAAQMD portion of the county. As shown in **Exhibit 5.0-4**, VMT within Sonoma County would increase at a rate than greater than population. With the Buildout Alternative, total VMT during the PM peak hour in Sonoma County would increase by 90 percent between 2000 and 2020 while population within the unincorporated portions of the county would increase 37 percent.

Therefore, the Buildout Alternative would result in emissions that are inconsistent with the Clean Air Plan for the BAAQMD and would also significantly increase emissions of ozone precursors in the remaining county area. While the existing *General Plan* includes some policies and programs that would support the Clean Air Transportation Control Measures (TCMs), this alternative would not benefit from the new policies and programs in the *Draft GP 2020*. Therefore, emissions of ozone precursors would be greater under the Buildout Alternative than under the *Draft GP 2020*.

Impact 4.3-2 Increased Particulate Emissions

The Buildout Alternative would result in a less-than-significant increase in particulate emissions. Although additional development would occur under this alternative, wood burning stoves and construction activities would be subject to existing regulations that would ensure that particulate emissions would be a less-than-significant impact. However, the impact would be greater under this alternative than under the *Draft GP 2020.*

Impact 4.3-3 Exposure to Odors / Toxic Air Contaminants

Similar to the *Draft GP 2020*, the Buildout Alternative would result in a significant impact with respect to these pollutants. Land uses and development consistent with this alternative could emit odors and toxic contaminants that could affect nearby land uses. Although the Buildout Alternative would result in more development overall, these particular land uses would likely occur in similar frequency under both the Buildout Alternative and the *Draft GP 2020*. As a result, the impact would be the same.

Impact 4.3-4 Exposure to Industrial Diesel Truck Emissions

The Buildout Alternative would result in a significant impact related to exposure to industrial diesel truck emissions. For the most part, land uses that would generate diesel truck emissions would be similar under the Buildout Alternative and the *Draft GP 2020*. However, this alternative would experience more timber conversions, less roadway improvements, and a greater overall level of construction. As a result, diesel truck emissions would likely be greater.

Impact 4.3-5 Aircraft Emissions

Similar to the *Draft GP 2020* the Buildout Alternative would result in a less-than-significant impact related to aircraft emissions. Levels of aircraft operations under this alternative would be the same as those under the *Draft GP 2020*. Therefore, this impact would be the same as under the *Draft GP 2020*.

NOISE

Impact 4.4-1 Increased Traffic Noise

The Buildout Alternative would result in a significant impact from increased traffic noise. Under this alternative, the projected increase in traffic over existing conditions would result in a significant increase in noise along certain roadway segments. Traffic noise would be greater than under the *Draft GP 2020* due to the relative lack of road and transit improvements, less restrictive noise policies, and increased land uses and development.

Impact 4.4-2 Impact to Noise Sensitive Development from Roadway Noise

The Buildout Alternative would result in a less-than-significant impact to noise sensitive development from roadway noise. Under this alternative, increased traffic over existing conditions would result in increased noise along certain roadway segment thus exposing new sensitive receptors to roadway noise levels greater than those considered normally acceptable. With an increased level of development, this alternative would likely expose more future sensitive receptors to unacceptable noise levels than under the *Draft GP 2020*. However, Noise Element policies of the existing *General Plan* would reduce this impact to a less-than-significant level. Nonetheless, the impact would be greater than under the *Draft GP 2020* due to reduced road and transit improvements, less restrictive noise policies, and increased land uses and development.

Impact 4.4-3 Increased Rail Noise

The Buildout Alternative assumes that there would be no initiation of the SMART passenger rail service. Without the SMART project, increased rail noise would be a less-than-significant impact and less of an impact than under the *Draft GP 2020*.

Impact 4.4-4 Impact to Noise Sensitive Development from Stationary Noise Sources

The Buildout Alternative would result in a less-than-significant impact to noise sensitive development from stationary noise sources. Application of the noise standards and policies in the *Draft GP 2020* would reduce noise impacts under this alternative. However, with exceptions for short duration noise events, for higher noise levels in urban areas, and for ambient conditions, the Buildout Alternative would allow noise levels from stationary sources to be slightly higher than those allowed by the *Draft GP 2020*. Therefore, this impact would be greater than under the *Draft GP 2020*.

Impact 4.4-5 Airport Noise

There is no applicable difference in policies between the Buildout Alternative and the *Draft GP 2020*. Airport noise would continue to be mitigated by policies in the Air Transportation Element and compliance with the Airport Land Use Plan discussed in ***Section 4.4 Noise***. Similar to the *Draft GP 2020*, the Buildout Alternative would result in less-than-significant airport noise impacts. These impacts would be the same as those under the *Draft GP 2020.*

HYDROLOGY AND WATER RESOURCES

Impact 4.5-1 Water Quality – Residential, Commercial, Industrial, and Public Uses

Unlike the *Draft GP 2020*, the Buildout Alternative would result in a significant impact to water quality from residential, commercial, industrial and public uses. Policies of the existing *General Plan*

and current local stormwater and water quality control regulations (e.g., the application of Best Management Practices) would adequately mitigate most construction-related water quality impacts, (for parameters other than soil erosion and sedimentation discussed below) and post-construction impacts. However, the Buildout Alternative would not result in the implementation of additional policies to protect water quality as would the *Draft GP 2020*. As the Buildout Alternative would result in greater development including agricultural processing, commercial, and residential uses, water quality impacts from these uses and activities would be greater under this alternative than under the *Draft GP 2020*.

Impact 4.5-2 Water Quality – Soil Erosion and Sedimentation Related to Construction

The Buildout Alternative would result in a less-than-significant water quality impact from soil erosion and sedimentation related to construction activities. Policies of the existing *General Plan* and current local stormwater and water quality control regulations (e.g., the development and implementation of Erosion Control Plans) would adequately mitigate construction-related and water quality impacts from soil erosion and sedimentation. However, the Buildout Alternative would not result in the implementation of additional policies to protect water quality as would the *Draft GP 2020*. Such policies would include requiring the preparation of an Erosion Control Ordinance as well as the increased involvement of the RWQCBs with water quality management programs. In addition, this alternative would result in more construction from the additional development, and could result in increased erosion and sedimentation. Therefore, soil erosion and sedimentation impacts to water quality from construction activities would be relatively greater under this alternative than under the *Draft GP 2020*.

Impact 4.5-3 Water Quality – Agricultural and Resource Uses

The Buildout Alternative would result in a significant impact to water quality from soil erosion and sedimentation from agricultural and resources uses. Existing *General Plan* policies are less protective than those of the *Draft GP 2020*. Therefore, under this alternative, significant soil erosion problems would likely occur from agricultural cultivation (e.g., vineyards) or other resource development on steep slopes. Existing *General Plan* policies would also afford less protection from cumulative or watershed scale hydrologic impacts such as increased runoff from agricultural and resource development than would the *Draft GP 2020*. In addition, this alternative would result in more agricultural and other rural uses which could result in an increase in erosion and sedimentation. As a result, this alternative would result in greater water quality impacts than would occur under the *Draft GP 2020*.

Impact 4.5-4 Water Quality – Wastewater Disposal

The Buildout Alternative would result in less-than-significant impact to water quality from wastewater disposal. Existing *General Plan* policies as well as current wastewater treatment and disposal regulations would adequately mitigate such impacts. However, the Buildout Alternative would not benefit from additional protective policies such as an emphasized coordination with the RWQCBs in developing improved management practices. In addition, this alternative would result in more usage of package treatment plants in rural communities which could result in a slight increase in water quality impacts from wastewater disposal as a consequence of future maintenance problems. Therefore, increased wastewater flows would result in relatively greater water quality impacts from wastewater disposal than would occur under the *Draft GP 2020*.

Impact 4.5-5 Groundwater Level Decline

The Buildout Alternative would result in a significant impact to groundwater resources. Existing and future declines in groundwater levels may continue and perhaps worsen under this alternative. The extent and magnitude of groundwater level declines in some areas of the county are not well understood and the Buildout Alternative would not benefit from *Draft GP 2020* programs that would improve groundwater monitoring, database development, and management practices. In addition, this alternative would result in more development and agricultural and other rural uses, which could result in increased groundwater usage and groundwater level decline. Therefore, the Buildout Alternative would result in relatively greater impacts to groundwater resources than would occur under the *Draft GP 2020*.

Impact 4.5-6 Saltwater Intrusion

The Buildout Alternative would result in a significant impact to groundwater resources from saltwater intrusion. The Buildout Alternative would not benefit from *Draft GP 2020* programs that place a greater emphasis on well regulation and groundwater monitoring, including the possible development of groundwater management plans. In addition, the Buildout Alternative could result in greater development and well use in impacted areas. Therefore, existing and potential future problems related to saltwater intrusion would continue to occur and may increase in severity under this alternative.

Impact 4.5-7 Well Competition and Adverse Well Interference

The Buildout Alternative would result in a significant impact to groundwater resources from well use. Existing localized problems involving well competition and well interference would continue to occur under this alternative and would likely worsen over time as competition for groundwater resources between users increases. The Buildout Alternative would not include additional controls over well development beyond current policies and the existing well ordinance as would the *Draft GP 2020*. Increased development and agricultural and other rural uses under the Buildout Alternative would therefore result in relatively greater impacts to groundwater resources than would occur under the *Draft GP 2020*.

Impact 4.5-8 Changes to Drainage Patterns Leading to Streambank Erosion

The Buildout Alternative would result in a significant impact related to streambank erosion due to changes in drainage patterns. Land uses and development consistent with the existing *General Plan* would result in alternations to drainage patterns and consequently, localized bank instability problems that would not be fully mitigated by existing policies and County grading and drainage ordinances. The Buildout Alternative would not result in the implementation of additional policies such as improved design guidelines and procedures. Increased development and agricultural and other rural uses under the Buildout Alternative would therefore result in relatively greater streambank erosion impacts than would occur under the *Draft GP 2020*.

Impact 4.5-9 Increased Flood Risk from Drainage System Alteration

The Buildout Alternative would result in a less-than-significant impact related to increased flood risk. Existing *General Plan* policies, County drainage ordinances and design guidelines, and CEQA review of discretionary projects involving drainage alteration would continue to adequately reduce this impact. However, the Buildout Alternative would not benefit from the development of additional controls including improved drainage design guidelines and procedures and the extension of the "No Net Fill" provision to all FEMA designated floodplains as would the *Draft GP 2020*. Therefore,

increased development and agricultural and other rural uses under the Buildout Alternative would result in relatively greater impacts related to flooding than would the *Draft GP 2020*.

Impact 4.5-10 Place Housing or Structures in 100-Year Flood Hazard Areas

The Buildout Alternative would result in a less-than-significant impact related to 100-year flood hazards. Existing *General Plan* policies, the County ordinance requiring construction permits in 100-year floodplains, Sonoma County Water Agency design guidelines, and CEQA review of discretionary projects involving drainage alteration would continue to adequately reduce this impact. However, the Buildout Alternative would not benefit from the development and implementation of additional controls including improved drainage design guidelines and procedures, the extension of the "No Net Fill" provision to all FEMA designated floodplains, or from strategies to reduce the incidence of flooding in repetitive flood damage areas of the county such as along the Russian River. Therefore, the Buildout Alternative would have relatively greater impacts related to flooding in 100 year flood hazard areas than would the *Draft GP 2020*.

Impact 4.5-11 Impede or Redirect Flows in Flood Hazard Areas

The Buildout Alternative would result in a significant impact from flooding as a result of impeded or redirected flows. Land uses and development consistent with the existing *General Plan* could result in localized flooding problems caused by drainage alterations from grading activities that may not be fully mitigated by current policies and County grading and drainage ordinances. The Buildout Alternative would not result in the implementation of additional controls such as improved drainage design guidelines and procedures. Therefore the Buildout Alternative would result in relatively greater flooding impacts from impeded or redirected flows in flood hazard areas than would occur under the *Draft GP 2020*.

Impact 4.5-12 Failure of Levee or Dam

Similar to the *Draft GP 2020*, the Buildout Alternative would result in a significant impact from flooding as a result of local levee or dam failure. Except for County built and maintained structures, dam and levee safety is not an area of County administrative authority but rather the responsibility of the agency that built these structures. Since there are no applicable policy differences in this area between the *Draft GP 2020* and the Buildout Alternative, flooding impacts from dam and levee failure would be the same under each.

BIOLOGICAL RESOURCES

Land uses and development consistent with the Buildout Alternative could have significant impacts to sensitive biological resources. Designated Riparian Corridors and Critical Habitat Areas represent only a relatively small portion of the known sensitive habitat in the county. Greater impacts on sensitive resources would most likely occur under this alternative as a result of less protective policies for riparian corridor protection, habitat management, resource education, and mitigation strategies than under the *Draft GP 2020.*

Impact 4.6-1 Special Status Species

The Buildout Alternative would result in a significant impact to special-status species. Future land uses and development consistent with the existing *General Plan* extend over known occurrences of special-status plant and animal species, which could be adversely affected by grading and other disturbance. There remains a potential for additional loss of unknown populations of special-status

species or loss of essential habitat for listed species as a result of activities which are not subject to County permit requirements. The allowance for more reductions in setback standards, waivers, and exemptions could contribute to both loss of individual occurrences of special-status species and to a general decline in the quality of essential habitat, leading to a long-term decline in viability of the population. As a result of these policy differences and the additional land uses and development under this alternative, impacts to special status species would be greater than under the *Draft GP 2020*.

Impact 4.6-2 Sensitive Natural Communities

The Buildout Alternative would result in a significant impact to sensitive natural communities. Future land uses and development consistent with the existing *General Plan* would extend over known occurrences of sensitive natural communities, which could be adversely affected by grading and other disturbance. This could include the substantial loss and modification to riparian habitat associated with intermittent and perennial streams, representing over 84 percent of the larger stream corridors in the county. The less restrictive criteria under this alternative would allow more waivers for remodels and additions, for unbuildable lots, and other development along even the designated streams in the county. The potential for adverse impacts due to future land uses and development within streamside habitat would therefore increase under this alternative. These impacts would contribute to a further reduction of sensitive natural communities in the county. As a result of these policy differences and the additional land uses and development under this alternative, impacts to special status species would be greater than under the *Draft GP 2020*.

Impact 4.6-3 Wetlands

Adverse changes to wetlands would represent a significant impact under the Buildout Alternative. Mapped and designated resources represent only a small portion of the wetlands in the county, and future development and land uses allowed under the existing *General Plan* could adversely affect known and unknown wetlands and associated habitat. Existing designated Riparian Corridors encompass only a relatively small segment of the important aquatic and terrestrial habitat this network provides. Minimum building setbacks of 50 feet from wetlands called for in the existing *General Plan* may not be large enough in many cases to adequately function as a buffer. The less restrictive criteria under this alternative would allow more waivers for remodels and additions, for unbuildable lots, and other development along streams and other wetland features in the county. As with the issue of sensitive natural communities, the policies would not adequately mitigate for wetland impacts in spite of existing federal and State regulations. As a result of these policy differences and additional land uses and development under this alternative, impacts to wetlands would therefore be greater than under both the No Project Alternative and the *Draft GP 2020*.

Impact 4.6-4 Wildlife Habitat and Movement Opportunities

The Buildout Alternative would result in a significant impact to wildlife habitat and movement opportunities. Under this alternative, continued urbanization, roadway expansion, habitat conversion, exclusionary fencing of vineyards and other factors would contribute to adverse changes to wildlife habitat and movement opportunities. Policies in the *Draft GP 2020* that would call for preparation of a comprehensive study of habitat connectivity and for new habitat mapping in Sonoma County would not be implemented under this alternative. Compared to the *Draft GP 2020,* this alternative would provide less direction on the need to protect important wildlife habitat and maintain connectivity as a method of sustaining viable habitat for native plants and wildlife. In addition, this alternative would include more land uses and development that the *Draft GP 2020.* Therefore, the impact to wildlife habitat and movement opportunities would be greater under this alternative than under the *Draft GP 2020*.

Impact 4.6-5 Conflict with Local Policies or Ordinances

Similar to the *Draft GP 2020,* the Buildout Alternative would result in a less-than-significant impact. Future land uses and development would be consistent with the existing *General Plan* and no significant conflicts with local policies or ordinances would be anticipated, resulting in the same impact as under the *Draft GP 2020.*

Impact 4.6-6 Conflict with Adopted Habitat or Natural Community Conservation Plans

No conservation plans have been adopted encompassing all or portions of Sonoma County. Therefore, no impact would be anticipated under the Buildout Alternative.

GEOLOGY AND SOILS

Impact 4.7-1 Seismic Ground Shaking

The Buildout Alternative would result in a significant seismic ground shaking impact. Policies and regulations of the existing *General Plan* would reduce these impacts under this alternative. However, the Buildout Alternative would not benefit from the additional policies of the *Draft GP 2020* that would provide greater protection against loss or damage resulting from future seismic groundshaking, particularly during stronger events. In addition, this alternative would include more land uses and development and agricultural and other rural uses which could result in a slight increase in structures at risk from earthquakes. Therefore, the Buildout Alternative would result in relatively greater impacts from seismic groundshaking than would occur under the *Draft GP 2020*.

Impact 4.7-2 Seismic Related Ground Failure

The Buildout Alternative would result in a significant seismic related ground failure impact. Policies and regulations of the existing *General Plan* would reduce these impacts under this alternative. However, the Buildout Alternative would not benefit from the additional policies of the *Draft GP 2020* that would provide greater protection against loss or damage resulting from future ground failure from stronger seismic events. In addition, this alternative would include more land uses and development and agricultural and other rural uses which could result in a slight increase in structures at risk from earthquakes. Therefore, the Buildout Alternative would result in relatively greater impacts from seismic related ground failure than would occur under the *Draft GP 2020.*

Impact 4.7-3 Landsliding

The Buildout Alternative would result in a significant landsliding impact. Policies and regulations of the existing *General Plan* would reduce these impacts under this alternative. However, the Buildout Alternative would not benefit from the additional policies of the *Draft GP 2020* that would provide greater protection against loss or damage resulting from future landslides, particularly those related to heavier rainfall or seismic events. In addition, this alternative would include more land uses and development and agricultural and other rural uses which could result in a slight increase in structures at risk from landsliding. Therefore, the Buildout Alternative would result in relatively greater impacts from landsliding than would occur under the *Draft GP 2020*.

Impact 4.7-4 Subsidence and Settlement

The Buildout Alternative would result in a significant subsidence and settlement impact. Policies and regulations of the existing *General Plan* would reduce these impacts under this alternative. However,

the Buildout Alternative would not benefit from the additional policies of the *Draft GP 2020* that would provide greater protection against loss or damage resulting from future subsidence and settlement, particularly related to stronger rainfall or seismic events. In addition, this alternative would include more land uses and development and agricultural and other rural uses which could result in a slight increase in structures at risk. Therefore, the Buildout Alternative would result in relatively greater impacts from subsidence and settlement than would occur under the *Draft GP 2020*.

Impact 4.7-5 Tsunamis and Seiches

Existing policies would reduce many of the adverse effects related to tsunamis and seiches. However, similar to the *Draft GP 2020*, the Buildout Alternative could result in a significant impact to roads, public facilities, and other County projects. Policies and regulations of the existing *General Plan* would reduce these impacts under this alternative. However, the Buildout Alternative would not benefit from the additional policies of the *Draft GP 2020* that would provide greater protection against loss or damage resulting from future seismic events which trigger tsunamis or seiches, particularly during stronger events. In addition, this alternative would include more land uses and development and agricultural and other rural uses which could result in a slight increase in structures at risk from tsunamis and seiches. Therefore, the Buildout Alternative would result in relatively greater impacts from tsunamis and seiches than would occur under the *Draft GP 2020*.

Impact 4.7-6 Soil Erosion

The Buildout Alternative would result in a significant soil erosion impact. Policies and regulations of the existing *General Plan* would reduce these impacts under this alternative. However, the Buildout Alternative would not benefit from the additional policies of the *Draft GP 2020* that would provide greater protection against soil erosion triggered by future rainfall, particularly during heavier rainfalls. In addition, this alternative would include more land uses and development and agricultural and other rural uses which could result in a slight increase in soil erosion. Therefore, the Buildout Alternative would result in relatively greater impacts from soil erosion than would occur under the *Draft GP 2020*.

Impact 4.7-7 Expansive Soils

The Buildout Alternative would result in a less-than-significant expansive soils impact. Policies and regulations of the existing *General Plan* would reduce these impacts under this alternative. However, the Buildout Alternative would not benefit from the additional policies of the *Draft GP 2020* that would provide greater protection against loss or damage resulting from expansive soils. In addition, this alternative would include more land uses and development and agricultural and other rural uses which could result in a slight increase in structures at risk from expansive soils. Therefore, the Buildout Alternative would result in relatively greater impacts from expansive soils than would occur under the *Draft GP 2020*.

Impact 4.7-8 Septic Suitability of Soils

The Buildout Alternative would result in a less-than-significant impact related to the septic suitability of soils. Land uses and development consistent with this alternative could result in the use of septic systems or alternative wastewater systems on soils incapable of supporting their use. However, policies of the existing *General Plan*, applicable codes, and current engineering, structural design, and construction practices would reduce this impact to a less-than-significant level. This impact would be the same as under the *Draft GP 2020*.

Impact 4.7-9 Mineral Resources

The Buildout Alternative would result in a less-than-significant impact to mineral resources. Policies of the existing *General Plan* as well as the County's *Aggregate Resource Management Plan* would avoid the loss of availability of a known mineral resource. As a result, this impact would be the same as under the *Draft GP 2020*.

AGRICULTURAL AND TIMBER RESORUCES

Impact 4.8-1 Conversion of Agricultural Lands to Non-Agricultural Uses

The Buildout Alternative would result in a less-than-significant impact related to the conversion of agricultural land to non-agricultural uses. Existing policies that promote Sonoma County's agricultural products stabilize the urban fringe, and limit the intrusion of residential uses into agricultural areas would afford agricultural lands protection from conversion. Compared to the *Draft GP 2020,* this alternative would result in greater conversion of agricultural land due to increased residential, commercial, and industrial development; rural uses; and expanded unincorporated USBs. However, because proposed policies of the *Draft GP 2020* that would limit agricultural uses in approximately 61,000 acres in setbacks adjacent to riparian corridors would not be implemented, the Buildout Alternative would result in less conversion of agricultural land than would occur under the *Draft GP 2020.*

Impact 4.8-2 Agricultural Processing and Support Uses

The Buildout Alternative would result in a less-than-significant impact related to the loss of productive agricultural land to processing and support uses. Thirty percent more agricultural cultivation would occur under this alternative than under the *Draft GP 2020*. Agricultural processing and support uses would be strongly encouraged but the requirements for demonstrating the linkage of these uses to local agricultural production would be less restrictive. In addition, such uses would not be regulated as strictly under the Buildout Alternative as they would by proposed policies of the *Draft GP 2020*. Policies that would avoid over-concentration of these uses would not be implemented. Therefore, while less-than-significant, the Buildout Alternative would result in a greater amount of agricultural land being taken out of production for agricultural processing and support uses than under the *Draft GP 2020*.

Impact 4.8-3 Agricultural Tourism

The Buildout Alternative would result in a less-than-significant impact related to the loss of agricultural land to agricultural tourism uses. These uses would be strongly supported but less demonstration of the linkage to local agriculture would be required. Policies that would avoid over-concentration of such development and coordinate special events would not be implemented. Additional types of agricultural tourism uses would be allowed on lands previously designated Rural Residential. Therefore, while less-than-significant, the Buildout Alternative would result in a greater amount of agricultural land being taken out of production for agricultural tourism uses than under the *Draft GP 2020*.

Impact 4.8-4 Timberland Conversion

The Buildout Alternative would result in a less-than-significant impact related to timberland conversion. Under this alternative, timber conversions to non-timber uses would continue to occur. Accordingly, given current trends, the Buildout Alternative would result in a greater amount of timber

conversion relative to the proposed project. While quantifying such conversion would be speculative, both current and projected trends for conversion to non-timber uses represent less than one percent of the total land in timber production, a less-than-significant amount.

PUBLIC SERVICES

Impact 4.9-1 Insufficient Water Supplies to Meet the Future Water Demand of the Urban Service Areas

The Buildout Alternative would result in a significant impact to water supplies. Currently, there is not enough information to conclude that sufficient water would be available to meet the future demand of land uses and development consistent with the Buildout Alternative in all Urban Service Areas (USAs). The Buildout Alternative would not include policies that place a greater emphasis on coordinated water supply planning, increased conservation, and water supply protection. Increased land uses and development under the Buildout Alternative could therefore result in greater deficiencies in future water supply than would occur under the *Draft GP 2020*.

Impact 4.9-2 Insufficient Water Supplies to Meet the Future Water Demand of Rural Private Domestic, Small Municipal, and Agricultural Wells

The Buildout Alternative would result in a significant impact to well water supplies. As in *Impact 4.9-1 Insufficient Water Supplies to Meet the Future Water Demand of the Urban Service Areas*, there is currently not enough information about groundwater supplies to conclude that sufficient water would be available to meet the future demand of all private domestic, small-municipal, and agricultural wells in rural areas. The Buildout Alternative would not include policies that place a greater emphasis on coordinated water supply planning, and increased well monitoring and regulation. In addition, this alternative would include more rural land uses and development than under the *Draft GP 2020*. Therefore, potential deficiencies in future groundwater water supply to rural well users under the Buildout Alternative would be greater than under the *Draft GP 2020*.

Impact 4.9-3 New or Expanded Water Supply Facilities

The Buildout Alternative would result in a significant impact to existing water supply and treatment facilities. As noted above, this alternative would generate local water demands greater than those of the *Draft GP 2020*. Such demand may exceed the supply capacity of several public water districts and private water companies and require new or expanded water supply facilities. The construction of such facilities could result in secondary construction-related impacts that would be greater than under the *Draft GP 2020*.

Impact 4.9-4 Increased Wastewater Treatment Demand

The Buildout Alternative would result in a significant impact to wastewater treatment services due to the uncertain feasibility of adding services to meet demand under this alternative. Policies regulating wastewater management services would support master planning for sanitation districts and limit extension of services beyond USAs, but they would also allow a broader use of package wastewater treatment plants. While greater usage of package wastewater treatment plans would provide additional wastewater service options, they may increase demand for other wastewater services due to the potential for failure over time. Increased land uses and development consistent with the Buildout Alternative may generate wastewater flows greater than that of the *Draft GP 2020* and may exceed the treatment capacity of the applicable service entity. As a result, this impact would be greater than under the *Draft GP 2020*.

Impact 4.9-5 New or Expanded Wastewater Facilities

The Buildout Alternative would result in a significant impact. As described in *Impact 4.9-4 Increased Wastewater Treatment Demand*, increased wastewater flows generated by the Buildout Alternative would necessitate new or expanded wastewater treatment facilities. The construction of such facilities could result in secondary construction-related impacts similar to but slightly greater than under the *Draft GP 2020.*

Impact 4.9-6 Increased Solid Waste Disposal Demand

The Buildout Alternative would result in a significant impact to solid waste disposal services. Under this alternative, the Sonoma County Integrated Waste Management Plan (CoIWMP) would remain the principal planning document for solid waste management in Sonoma County. As unincorporated area land uses and development would be greater than that of the proposed project, the Buildout Alternative would generate a solid waste stream greater than that of the *Draft GP 2020*.

There is uncertainty in regards to future solid waste disposal capacity as discussed in ***Section 4.9 Public Services***. Delays in the Central Landfill expansion project will require the closure and transportation of solid waste to sites outside the county for several years. Following completion of the expansion project, the Central Landfill is expected to have adequate capacity to serve Sonoma County's solid waste disposal needs until 2015. Additional projects recommended in the CoIWMP may provide sufficient capacity until 2050; however, it uncertain if such projects are feasible. Therefore, this impact would be greater than that of the *Draft GP 2020*.

Impact 4.9-7 Increased Demand for Parks and Recreation Services and Facilities

The Buildout Alternative would result in a significant impact to parks and recreation services and facilities. Land uses and development in the unincorporated area consistent with the Buildout Alternative would result in greater deficiencies in parks and recreation services relative to the proposed project. While full implementation of an Outdoor Recreation Plan could result in the development of parks and recreational facilities sufficient to meet existing park planning guidelines, there is no guarantee that such actions would occur. Development of required park and recreation projects could result in similar impacts from the environment from construction related activities under the *Draft GP 2020.*

Impact 4.9-8 Demand for Public Education Services and Facilities

Unlike the *Draft GP 2020*, the demand for public education services and facilities would be a significant impact under the Buildout Alternative. Population growth consistent with this alternative would generate more new students than would the proposed project. This alternative could generate a substantial demand for additional school services in some unincorporated areas and such demand could exceed the existing public school capacity. As a result, new or expanded public school facilities may be required; the construction of which could result in significant secondary-construction related impacts that would be greater than those under the *Draft GP 2020.*

Impact 4.9-9 Increased Demand for Fire Protection and Emergency Services Facilities

The Buildout Alternative would result in a significant impact to public fire protection and emergency services facilities. Policies governing fire protection services would be the same as those in the existing *General Plan*. Current funding trends will likely reduce the number of volunteer fire companies within the unincorporated area. Relative to the proposed project, increased land uses development consistent with the Buildout Alternative would further exacerbate service level

deficiencies and therefore require new or expanded fire protection and emergency services facilities. The construction of such facilities could result in secondary construction-related impacts greater than those under the *Draft GP 2020*.

Impact 4.9-10 Wildland Fire Hazards

The Buildout Alternative would result in a significant impact related to wildland fire hazards. This alternative would result in the increased development of structures within wildland fire hazard areas. Policies in the existing *General Plan* as well as Sonoma County ordinances requiring automatic sprinkler systems in new residential and commercial development would reduce the hazard of wildland fires. However, the absence of *Draft GP 2020* policies, such as improving the street addressing system, coupled with the additional land uses and development under this alternative would result in greater impacts than under the *Draft GP 2020*.

Impact 4.9-11 Demand for Additional Criminal Justice Facilities

The Buildout Alternative would result in a significant impact to criminal justice facilities. Assuming current Sheriff's Department hiring trends would continue, population growth in the unincorporated area consistent with the Buildout Alternative would result in a lower service level of approximately 1.04 deputies per 1,000 residents in 2020 (as compared to 1.19 under the *Draft GP 2020*). In addition, increased land uses and development consistent with this alternative would result in the demand for new or expanded Sheriff's Department substations and detention facilities, the construction of which could cause significant environmental impacts. Therefore, this impact would be greater than under the *Draft GP 2020.*

Impact 4.9-12 Increased Demand for Library Facilities

The Buildout Alternative would result in a significant impact to library facilities. Relative to the *Draft GP 2020*, increased population growth consistent this alternative would require new or expanded County Library facilities while further exacerbating projected system deficiencies. The additional demand would necessitate the construction of new facilities that could result in significant environmental impacts greater than under the *Draft GP 2020*.

Impact 4.9-13 Increased Demand for Human Services Facilities

The Buildout Alternative would result in a significant impact to County human services. Unincorporated population growth consistent with this alternative could exceed the ability of the County's Human Services Department to maintain an acceptable level of service within its present level of funding and facilities. This additional demand may necessitate more facilities than under the *Draft GP 2020* the construction of which would result in significant environmental impacts.

CULTURAL RESOURCES

Impact 4.10-1 Historic Resources

The Buildout Alternative would result in a significant impact to historic resources. New land uses and development and re-development consistent with the Buildout Alternative could increase the extent to which historic resources (summarized in **Exhibit 4.10-1)** would be disturbed. While policies of the existing *General Plan* and the Sonoma County Historic Preservation Program would adequately protect designated historical resources, similar to the *Draft GP 2020,* impacts to undesignated historical resources from building or other ministerial permits could be significant. In addition, a new

ordinance requiring that Unreinforced Masonry Buildings (UMBs) be strengthened and / or reinforced would not be considered as it would under the *Draft GP 2020*. Therefore impacts to historic resources would be relatively greater under the Buildout Alternative than under the *Draft GP 2020*.

Impact 4.10-2 Archeological and Paleontological Resources and Human Remains

The Buildout Alternative would result in a significant impact to Archeological and Paleontological Resources. Increased land uses and development consistent with the Buildout Alternative could increase the extent to which subsurface archeological and paleontological resources as well as human remains would be disturbed. While existing policies and procedures (i.e., Northwest Information Center referrals) would likely protect documented archeological and / or paleontological resources, they may not adequately protect previously unidentified resources. Furthermore, ministerial projects and land use activities not subject to permits could disturb such resources as well. Therefore such impacts under the Buildout Alternative would be greater than those under the *Draft GP 2020*.

VISUAL RESOURCES

Impact 4.11-1 Community Separators, Scenic Landscape Units, Scenic Corridors, and Scenic Highways

Unlike the *Draft GP 2020*, visual impacts within Community Separators, Scenic Landscape Units, Scenic Corridors, and Scenic Highways would be significant under the Buildout Alternative. Policies of the existing *General Plan* under this alternative related to design guidelines for new development within Community Separators and Scenic Landscape Units are less restrictive than those proposed by the *Draft GP 2020*. Scenic Corridor and Scenic Highway Design Guidelines are the same as those of the *Draft GP 2020.* Additionally, existing policies would be less restrictive in terms of the types of agricultural processing and support and agricultural tourism uses allowed and could result in more development of such uses in these areas. Therefore, the Buildout Alternative could result in greater visual resource impacts in these Scenic Resource areas than would the *Draft GP 2020*.

The Buildout Alternative would also not result in the boundaries of Scenic Landscape Unit being extended up to and over the crests of hills and ridges as would implementation of the *Draft GP 2020.* Impacts to the visual quality of Scenic Landscape Units resulting from development in close proximity to significant hillsides and ridgelines could be greater as a result of increased land uses and development under this alternative.

Impact 4.11-2 Visual Impacts in Other Urban and Rural Areas

The Buildout Alternative would result in significant visual impacts in other urban or rural areas that are not designated Scenic Resources. Not only would these areas not benefit from the proposed urban design and rural character policies of the *Draft GP 2020*, there would be more land uses and development associated with this alternative. As a result, visual impacts would be greater than under the *Draft GP 2020*.

Impact 4.11-3 Light Pollution and Nighttime Sky

The Buildout Alternative would result in a significant visual impact related to light pollution and the nighttime sky. Although discretionary project review allows for the mitigation of light pollution for some projects, the existing *General Plan* does contain not contain policies that specifically address lighting and glare issues, particularly for ministerial permits or land uses that do not require permits. Increased land uses and development consistent with this alternative would result in relatively greater

visual impacts associated with outdoor lighting (e.g., light trespass, light pollution, and sky glow) than would the *Draft GP 2020*.

ENERGY

Impact 4.12-1 Energy Consumption from Land Use Locations and Patterns

Similar to the *Draft GP 2020*, the Buildout Alternative would result in a less-than-significant impact related to energy consumption from land use locations and patterns. The land use patterns of the existing *General Plan* would reduce the future reliance upon single occupancy vehicles, a major user of energy. As a result, land use patterns under the Buildout Alternative would not result in wasteful, inefficient, and unnecessary consumption of energy and energy consumption as a consequence of land use patterns would be the same as under the *Draft GP 2020*.

Impact 4.12-2 Energy Consumption from Building Construction and Retrofit

Unlike the *Draft GP 2020*, energy consumption from building construction and retrofit would represent a significant impact under the Buildout Alternative. This alternative would result in greater construction of new buildings for residential, commercial, industrial, agricultural, and public uses. This construction (including retrofit) and subsequent use of the buildings would require additional energy resources for daily operations. Although existing codes and energy reduction programs would reduce impacts to energy resources from building construction and retrofit, they would not be as effective as the *Draft GP 2020* under this alternative.

Impact 4.12-3 Increased Energy Demand and Need for Additional Energy Resources

The Buildout Alternative would result in a significant impact related to increased energy demand and the need for additional energy resources. Under this alternative, the increased demand for energy resources through 2020 would be substantially higher than that of the proposed project in that unincorporated population growth, land uses, and development would be greater. The existing *General Plan* does not contain policies that promote small-scale decentralized power generation and renewable energy as would the *Draft GP 2020*. Therefore, the Buildout Alternative would not be as effective in stabilizing regional power supply and diversifying energy production methods, as would the *Draft GP 2020* through its policies that would encourage such energy projects. Energy usage and demand would continue to increase as a consequence of future growth, however efficient, and because automobile travel would continue for some time to be the travel mode of choice.

The Buildout Alternative would not result in the implementation of the proposed energy conservation and demand reduction policies contained in the *Draft GP 2020* that promote strategic planning, energy conservation education, energy efficient construction, and alternative fuel use. Nor would it include the SMART Rail project, which would provide an alternative to single-occupancy automobile travel. As a result, energy demand would be greater under this alternative than under the *Draft GP 2020*.

HAZARDOUS MATERIALS

Impact 4.13-1 Release of Hazardous Materials

The Buildout Alternative would result in a less-than-significant impact related to the release of hazardous materials. Land uses and the increased level of development consistent with the Buildout Alternative could result in a greater level of use, transport, and disposal, of hazardous materials.

Therefore, this alternative could result in a greater exposure of the public to such materials through either their routine use or due to accidental release than under the *Draft GP 2020*. However, similar to the proposed project, policies of the existing *General Plan* would help reduce the potential for a hazardous materials release as well as reduce the potential for damage or loss in the event of such a release.

Impact 4.13-2 Hazardous Materials, Substances, or Waste near School Sites

The Buildout Alternative would result in a significant impact related to hazardous materials, substances, or wastes near school sites. The additional land uses and development consistent with the Buildout Alternative could result in a greater likelihood that the increased exposure to hazardous materials may occur in the vicinity of school sites. Therefore, this impact would be greater than under the *Draft GP 2020*.

Impact 4.13-3 Hazardous Materials near Airports

The Buildout Alternative would result in a less-than-significant impact related to hazardous materials near airports. Discretionary review of projects as well as compliance with the *Comprehensive Airport Land Use Plan* (CALUP) would ensure that this impact would be reduced to a less-than-significant level. However, due to the additional land uses and development under this alternative, the impact would be slightly greater than under the *Draft GP 2020*.

4.4 ALTERNATIVE 3 MITIGATED ALTERNATIVE

The purpose of this alternative is to substantially reduce environmental impacts, compared to those of the *Draft GP 2020*. This alternative would result in the same level of population, housing, and employment growth in the unincorporated areas of the county because the land use designations would be the same as the *Draft GP 2020*. However, this alternative incorporates policies intended to provide greater resource protection and therefore less significant environmental impacts than the proposed project. The policy choices assumed to be adopted under this alternative are described in ***Section 5.1 Description of Alternatives***.

Analysis of Mitigated Alternative

LAND USE, POPULATION, AND HOUSING

Impact 4.1-1 Growth and Concentration of Population

The Mitigated Alternative would result in a less-than-significant impact related to growth and concentration of population. This alternative would result in Urban Service Areas (USAs) that would be smaller than those proposed by the *Draft GP 2020*, thus reducing the development potential of the urban areas. The proposed Land Use Amendments would not be implemented. Therefore, no changes to existing land use designations would occur that would result in an increase in development potential. While overall unincorporated population and housing growth would be the same as that proposed by the *Draft GP 2020*, there would not be additional affordable housing sites and there

would likely be less rural uses due to policies regarding Certificates of Compliance and package treatment plants. Population growth would be consistent with ABAG projections.

Although some of the additional road improvements under this alternative would extend into rural areas in order to reduce congestion, these roadways would not be expected to result in increased sprawl due to the effectiveness of the land use and urban boundary policies under this alternative. Given such factors, implementation of the Mitigated Alternative would result in slightly less development in rural areas than would the *Draft GP 2020* and therefore would result in less of an impact.

Impact 4.1-2 Land Use Conflicts between Agricultural and Residential / Urban Uses

The Mitigated Alternative would result in a significant impact related to land use conflicts between agricultural and urban / residential uses. Policies designed to reduce agricultural and urban land use conflicts by limiting the intrusion of new residential uses into agricultural areas as well as mitigating conflicts between such uses in designated agricultural production areas, would be the same as those of the *Draft GP 2020*. In addition, the Sonoma County Right to Farm Ordinance would continue to support existing policies, educate the public about agricultural operations and their importance, as well as reducing land use conflicts between agricultural and urban neighbors. Nonetheless, land use conflicts would continue to occur at the rural / urban interface as noted in ***Section 4.1 Land Use, Population, and Housing***. Noise policies would be slightly more restrictive than under the *Draft GP 2020*, thereby reducing land use conflicts compared to the proposed project.

Impact 4.1-3 Incompatible Land Uses in the Rural Area

The Mitigated Alternative would result in a less-than-significant impact related to incompatible uses in the rural area. The reduced amount of anticipated agricultural cultivation that would likely occur under this alternative would result in correspondingly less development of agricultural processing and agricultural tourism uses compared to the *Draft GP 2020*. Therefore, land use conflicts resulting from these uses would be reduced under this alternative relative to the proposed project.

However, reduced agricultural cultivation and associated processing and agricultural tourism uses under this alternative could have a dampening effect on the economic feasibility of agriculture in some areas. If a substantial portion of agricultural lands were removed from production due to policy restrictions, their viability may be threatened. This would result in additional pressure to convert to residential, commercial, or other non-agricultural uses. Were such conversions to occur, the land use compatibility impacts, as well as related open space, transportation, noise and other environmental impacts may be greater than would occur under the *Draft GP 2020*.

Impact 4.1-4 Affordable Housing

The Mitigated Alternative would result in a less-than-significant impact related to land use incompatibilities from affordable housing projects. This alternative would not include the designation and development of additional affordable housing sites. Therefore, while the Mitigated Alternative would result in less land use incompatibility impacts than under the *Draft GP 2020,* a major program of the Housing Element would not be implemented.

TRANSPORTATION

As discussed in ***Section 4.2 Transportation***, to identify potential levels of traffic impacts, a traffic analysis for the Mitigated Alternative was performed using a computer-based traffic model. **Exhibit**

5.0-6 shows those roadways that would have a significant impact in 2020 in the PM peak hour based on adoption and implementation of the Mitigated Alternative. This analysis uses the same thresholds of significance as used in ***Section 4.2 Transportation***.

In **Exhibit 5.0-6,** a directional orientation (e.g., "S" or "W") means in the southbound or westbound direction, depending on whether the roadway runs north-south or east-west. "Both" means "in both directions".

The Mitigated Alternative includes a substantial number of improvements not included in the *Draft GP 2020*. These improvements were presented during meetings of the GP 2020 Circulation and Transit Subcommittee under the "mobility" option. [4] This Alternative would reduce congestion to 18 locations with significant level of service impacts, mostly on State highways or US 101. Although not studied in the traffic modeling process, this alternative could also include other improvements to reduce congestion that were considered by the CAC for the Penngrove area. These include the extension of Bodway south from Railroad Avenue to Old Redwood Highway, the closure of Petaluma Hill Road at Railroad Avenue, and other travel restrictions designed to divert traffic from or around the Penngrove community.

4 *Draft Circulation and Transit Element*, CAC Memo, Sonoma County PRMD, April 27, 2004

Exhibit 5.0-6
Roadways Experiencing Significant Impact in the PM Peak Hour with Mitigated Alternative

Roadway	*Direction*	*Baseline LOS*	*2020 LOS*
Mark West Springs Rd east of Highway 101	Both	B/A	F/E
Occidental Rd west of Sanford Rd	W	C	D
Petaluma Hill Rd north of Snyder Ln	S	B	D
Rohnert Park Expwy east of Stony Point Rd	W	D	D
Santa Rosa Ave north of Mountain View Ave	Both	F/B	F/E
Highway 12 south of Verano Rd	Both	F/F	F/F
Highway 37			
west of Lakeville Hwy	E	E	F
Between Lakeville Hwy and Hwy 121	E	B	E
Highway 116 east of Adobe Rd	E	D	F
Highway 121 south of Hwy 116	E	C	E
US 101 [a]			
at Marin County Line	N	F/B	F
Cotati Grade north of ORH	N	E/C	F
between Hwy 116 and Rohnert Park Expwy	Both	D/D	F/E
north of Wilfred Ave	Both	D/F	F/F
south of Hwy 12	Both	F/F	F/F
south of River Rd	Both	C/C	F/F
north of Airport Blvd	Both	C/B	F/E
north of Windsor River Rd	S	A/B	D

a US 101 Baseline (2000-2001) PM Peak Level of Service based on counts (Northbound/Southbound). This pre-dates the widening from Wilfred Avenue to Highway 12 that opened in November 2002.

Source: Dowling Associates, Inc., 2004.

Impact 4.2-1 Congestion on Local County and City Roadway Segments

The Mitigated Alternative would result in significant impacts to local county and city roadway segments. Under this alternative, four county roadways with a total of five roadway segments would be deficient in the PM peak hour as compared to nine roadway segments for the *Draft GP 2020*. The primary reason for the reduced congestion would be the relative increase in roadway and transit improvements that would occur compared to the *Draft GP 2020*. Also affecting this congestion would be the relative lack of rural uses such as agricultural processing, agricultural tourism, churches, etc. that would occur.

If the extension of Bodway Parkway south from Railroad Avenue to Old Redwood Highway was constructed in the Penngrove area, then in addition to the other improvements in this alternative, it would further reduce congestion on Main Street and the southern end of Petaluma Hill Road. The extension would also divert traffic from Railroad Avenue to a more southerly point on Old Redwood Highway and would reduce traffic flow along the eastern bypass route connecting Petaluma Hill Road and Adobe Road. In any case, due to the extent of improvements provided under this alternative, the addition of this improvement likely would not result in additional significant congestion in this area.

If additional traffic flow restrictions are included in the Penngrove area, they would result in increased congestion depending upon the nature and location of the restriction. The CAC considered a modification of the Railroad Avenue / Petaluma Hill Road intersection that would prohibit north / south traffic flow through the intersection and redirect it to east / west flow along Railroad Avenue and Old Redwood Highway or US 101. If this improvement were included, it would alter traffic patterns in this area and would result in reduced congestion on Petaluma Hill Road south of its intersection with Railroad Avenue and on Main Street. However, local traffic within the community would also be restricted. It would likely result in significant congestion on Railroad Avenue and on Old Redwood Highway. Traffic flow on Adobe Road from Old Redwood Highway to Frates Road would be similar to that under the *Draft GP 2020* unless traffic calming measures or flow restrictions were included along this route.

Impact 4.2-2 Congestion on State Highways

The Mitigated Alternative would result in a significant impact to State highways. Under this alternative, one segment of State Route 12, two segments of State Highway 37, one segment of State Highway 116 and one segment of State Route 121 would be deficient in the PM peak hour. This level of congestion would be less than what would occur under the *Draft GP 2020* and the reasons for this reduced congestion are the same as those described under *Impact 4.2-1 Congestion on Local County and City Roadway Segments*.

If the extension of Bodway Parkway south from Railroad Avenue to Old Redwood Highway was constructed in the Penngrove area, the traffic impact on State highways would be minimal. The other routes included in this alternative, in combination with US 101 improvements, would not likely alter congestion compared to the *Draft GP 2020*. If traffic flow restrictions were included (e.g., the closure of the Petaluma Hill Road / Railroad Avenue intersection to north / south travel) traffic flow would likely be diverted to surrounding arterial roadways. Depending upon the nature of the restriction, traffic could increase on the Highway 116 / Lakeville Highway corridor to US 101. Additional study would be required of specific restrictions at the project level in order to determine the actual traffic volumes on State highways.

Impact 4.2-3 Congestion on Portions of US 101 in Several Areas between Cotati to North of Windsor

The Mitigated Alternative would result in a significant impact to portions of US 101 between the Marin County line and Windsor. Under this alternative, eight segments of US 101 would be deficient in the PM Peak Hour: from the Marin County line, Cotati Grade, south of Rohnert Park Expressway, north of Wilfred Avenue, south of Highway 12, south of River Road, north of Airport Boulevard, and north of Windsor River Road. This congestion would be less than that under the *Draft GP 2020* for the same reasons as those described under *Impact 4.2-1 Congestion on Local County and City Roadway Segments*.

In general, the addition of capacity improvements in the Penngrove area (e.g., the extension of Bodway Parkway to Old Redwood Highway) would reduce congestion on US 101 by providing an alternative route for portions of this corridor. However, the reduced congestion would be limited to the US 101corridor from Petaluma to Rohnert Park since commute traffic would eventually connect to Marin County or to the Santa Rosa area. Therefore, the traffic impacts would likely be less than those that would occur under the *Draft GP 2020*.

The addition of traffic calming measures and / or flow restrictions in this area would likely result in additional congestion on US 101, particularly if the restrictions force traffic into that corridor. Therefore, these restrictions could result in traffic impacts to US 101 that would be greater than those that would occur under the *Draft GP 2020*.

Impact 4.2-4 Congestion at Key Intersections throughout the County

The Mitigated Alternative would result in a significant impact to key intersections throughout the county. Implementation of this alternative would include a significant number of transportation improvements not included in the *Draft GP 2020*. However, the projected growth in population through 2020 would still result in increased congestion at key intersections, but less than that what would occur under the *Draft GP 2020*.

Intersection congestion in the Penngrove area would also be less than what would occur under the *Draft GP 2020*. The extension of Bodway Parkway would contribute to reduced intersection congestion by orienting traffic flow from downtown Penngrove to the Old Redwood Highway arterial corridor. However, the addition of traffic calming measures and / or flow restrictions could result in increased intersection congestion depending upon the nature and location of the restrictions. If these measures would be more restrictive of traffic flow than those measures included in the *Draft GP 2020*, then intersection congestion would be greater under this alternative.

Impact 4.2-5 Increased Demand for Transit Services

The Mitigated Alternative would result in a less-than-significant impact to transit services. Under this alternative transit ridership would be similar to the *Draft GP 2020* due to the initiation of SMART. The primary reason for this reduced impact on transit demand would be the combination of less urban and rural land uses with increased transit improvements under the Mitigated Alternative.

Impact 4.2-6 Air Traffic Safety

Similar to the *Draft GP 2020*, the Mitigated Alternative would result in a less-than-significant impact related to air traffic safety. Under this alternative, air operations at Sonoma County airports would be subject to existing policies of the Airport Land Use Commission's *Comprehensive Airport Land Use*

Plan as well as policies of the current Air Transportation Element, resulting in impacts that would be the same as those of the *Draft GP 2020*.

Impact 4.2-7 Conflict with Alternative Transportation

Similar to the *Draft GP 2020,* the Mitigated Alternative would result in a less-than-significant impact. Policies that would result in trip reduction through the promotion of alternative transportation methods (e.g., carpools, jobs – housing balance, consistency with local plans) would be the same under the Mitigated Alternative as those proposed by the *Draft GP 2020*. Therefore, this impact would be the same as under the *Draft GP 2020*.

Impact 4.2-8 Lack of Parking Capacity or Emergency Access

Similar to the *Draft GP 2020* the Mitigated Alternative would result in a less-than-significant impact related to insufficient parking and emergency access. Applicable policies in the Mitigated Alternative would be the same as those of the *Draft GP 2020.* Proposed projects would be subject to the Parking Standards in the Zoning Code and project review by County staff and local fire and emergency districts to assure adequate parking capacity and emergency access is provided. As a result, the impacts of this alternative would be the same as those that would occur under the *Draft GP 2020*.

Impact 4.2-9 Safety Risk from Transportation System Design

Similar to the *Draft GP 2020* this would be a less-than-significant impact. Under the Mitigated Alternative, design of improvements to existing or new road and transit systems would be subject to County and State standards as well as the American Association of State Highway Transportation Officials (AASHTO) road classification system. As a result, the impacts of this alternative would be the same as those that would occur under the *Draft GP 2020*.

AIR QUALITY

Impact 4.3-1 Increased Emissions of Ozone Precursors

The Mitigated Alternative would result in a significant air quality impact from increased emissions of ozone precursors. As with the *Draft GP 2020*, the Mitigated Alternative would be consistent with the latest ABAG population projections that are used in the regional Clean Air Plan (CAP) within the BAAQMD portion of the county. As shown in **Exhibit 5.0-4** VMT within Sonoma County would increase at a rate than greater than population. With the Mitigated Alternative, total VMT during the PM peak hour in Sonoma County would increase by 43 percent between 2000 and 2020, while population within the unincorporated portions of the county would increase by 15 percent. The increase in VMT would result in an increase in emissions of ozone precursors. Therefore, the Mitigated Alternative would result in emissions that would be inconsistent with the CAP for the BAAQMD and would also substantially increase ozone precursor emissions in the remaining portion of the unincorporated area.

Similar to the *Draft GP 2020,* the Mitigated Alternative would include existing and proposed policies that would support the Clean Air Transportation Control Measures (TCMs) (see **Exhibit 4.3-5**). The combination of increased roadway and transit improvements with less land use and development would result in fewer emissions of ozone precursors than under the *Draft GP 2020*.

Impact 4.3-2 Increased Particulate Emissions

Similar to the *Draft GP 2020* the Mitigated Alternative would result in a less-than-significant increase in particulate emissions. Wood burning stoves and construction activities would be subject to existing regulations which would ensure that these would be less-than-significant impacts. This impact would be the same as what would occur under the *Draft GP 2020*.

Impact 4.3-3 Exposure to Odors / Toxic Air Contaminants

Similar to the *Draft GP 2020*, the Mitigated Alternative would result in a significant impact with respect to these pollutants. Land uses and development consistent with this alternative could emit odors and toxic contaminants that could affect nearby land uses. Although the Mitigated Alternative would result in less development overall, these land uses would likely occur in similar frequency under both the Mitigated Alternative and the *Draft GP 2020*. As a result, the impact would be similar to what would occur under the *Draft GP 2020*.

Impact 4.3-4 Exposure to Industrial Diesel Truck Emissions

Similar to the *Draft GP 2020* the Mitigated Alternative would result in a significant impact related to exposure to industrial diesel truck emissions. For the most part, land uses that would generate diesel truck emissions would be similar to those that would occur under the *Draft GP 2020*. However, this alternative would experience less timber conversions and rural uses which generate truck traffic and more road and transit improvements which may reduce truck emissions through improved efficiency. As a result, diesel truck emissions would be slightly less than those that would occur under the *Draft GP 2020*.

Impact 4.3-5 Aircraft Emissions

Similar to the *Draft GP 2020* the Mitigated Alternative would result in a less-than-significant impact related to aircraft emissions. Levels of aircraft operations under this alternative would be the same as those under the *Draft GP 2020*. Therefore, this impact would be the same as under the *Draft GP 2020*.

NOISE

Impact 4.4-1 Increased Traffic Noise

Similar to the *Draft GP 2020* the Mitigated Alternative would result in a significant impact from increased traffic noise. Under this alternative, the projected increase in traffic over existing conditions would result in a significant increase in noise along certain roadway segments. The combination of increased road and transit improvements, less land uses, and more restrictive noise policies, would reduce this impact, but not to a less-than-significant level. This alternative would result in a similar traffic noise impact as would the *Draft GP 2020*.

Impact 4.4-2 Impact to Noise Sensitive Development from Roadway Noise

Similar to the *Draft GP 2020*, the Mitigated Alternative would result in a less-than-significant impact to new noise sensitive development from roadway noise. Under this alternative, increased traffic over existing conditions would result in increased noise along certain roadway segment thus exposing new sensitive receptors to roadway noise levels greater than those considered normally acceptable. With a decreased level of development and more restrictive noise policies, this alternative would likely

expose fewer future sensitive receptors to unacceptable noise levels than under the *Draft GP 2020*. However, more roadway improvements may increase the exposure to roadway noise either next to new roadways or along existing roads with more traffic. As a result, the combination of these effects would result in a similar impact to that of the *Draft GP 2020*.

Impact 4.4-3 Increased Rail Noise

Similar to the *Draft GP 2020*, the Mitigated Alternative could result in a significant impact from increased rail noise. With the initiation of SMART, noise sensitive land uses could be exposed to increased noise levels from rail activity and this impact would be the same as under the *Draft GP 2020*.

Impact 4.4-4 Impact to Noise Sensitive Development from Stationary Noise Sources

Similar to the *Draft GP 2020,* the Mitigated Alternative would result in a less-than-significant impact to noise sensitive development from stationary noise sources. Application of the noise policies under this alternative would mitigate noise from stationary sources to acceptable levels. The noise levels allowed by the *Draft GP 2020*, however, are less stringent because they would not allow the noise standards to be reduced in rural areas. As a result, the Mitigated Alternative would require noise levels from stationary sources to be slightly lower than those allowed by the *Draft GP 2020*.

Impact 4.4-5 Airport Noise

Because there are no applicable differences in policies, The Mitigated Alternative would result in less-than-significant airport noise impacts. Such impacts would be the same those that would occur under the *Draft GP 2020*.

HYDROLOGY AND WATER RESOURCES

Impact 4.5-1 Water Quality – Residential, Commercial, Industrial, and Public Uses

The Mitigated Alternative would result in a less-than-significant water quality impact from residential, commercial, industrial and public uses. Policies of the existing *General Plan* and current regulations would adequately mitigate construction related water quality impacts. In addition, similar to the *Draft GP 2020*, policies of this alternative would result in greater emphasis on increased coordination between the Regional Water Quality Control Boards (RWQCBs) and NPDES stormwater and TMDL programs. Additional policies such as the expansion of storm water pollution controls to all new uses would also be implemented. These policies would adequately mitigate construction-related water quality impacts, (for parameters other than soil erosion and sedimentation) and post-construction impacts. Coupled with the reduced rural uses that would occur under this alternative, water quality impacts from these uses would be less than those under the *Draft GP 2020*.

Impact 4.5-2 Water Quality – Soil Erosion and Sedimentation Related to Construction

The Mitigated Alternative would result in a less-than-significant water quality impact from soil erosion and sedimentation related to construction activities. Policies of the *Draft GP 2020* and current local stormwater and water quality control regulations (e.g., the development and implementation of Erosion Control Plans) as well as expanded stormwater policies that include all land uses (regardless of type, size or location of project.) would adequately mitigate construction-related water quality impacts. As slightly less construction is anticipated under the Mitigated Alternative, soil erosion and

sedimentation impacts to water quality from construction activities would be less than those of the *Draft GP 2020*.

Impact 4.5-3 Water Quality – Agricultural and Resource Uses

The Mitigated Alternative would result in a significant impact to water quality (i.e., from soil erosion and sedimentation) from agricultural and resources uses. Proposed *Draft GP 2020* policies as well as additional policies of the Mitigated Alternative would be more protective of water quality than under the *Draft GP 2020*. More restrictive Mitigated Alternative policies, especially those related to sensitive habitat areas and the conversion of timber and riparian buffer areas to vineyards and other cultivated crops would result in less hillside cultivation. However, neither the *Draft GP 2020* nor the Mitigated Alternative would adequately address the issue of cumulative or watershed scale hydrologic and water quality impacts of hillside cultivation and conversion of native landscape areas to agricultural uses (i.e., vineyards). As a result, impacts to water quality from these uses would be reduced under the Mitigated Alternative compared to those under the *Draft GP 2020*.

Impact 4.5-4 Water Quality – Wastewater Disposal

Similar to the *Draft GP 2020*, the Mitigated Alternative would result in less-than-significant impact to water quality from wastewater disposal. More emphasis would be placed on wastewater management in the Mitigated Alternative, including upgrading treatment plants and an increased focus on areas of failing septic tanks. In addition, less urban uses and less usage of package treatment plans in rural areas would occur. Therefore, impacts to water quality from wastewater disposal under the Mitigated Alternative would be less than those that would occur under the *Draft GP 2020*.

Impact 4.5-5 Groundwater Level Decline

The Mitigated Alternative would result in a significant impact to groundwater resources. As with the *Draft GP 2020*, existing and projected future declines in groundwater levels would be expected to continue and perhaps worsen over time under this alternative, particularly given that capacity of groundwater supplies are uncertain. Under the Mitigated Alternative, *Draft GP 2020* programs that would improve groundwater monitoring, database development, and management practices would be implemented. In addition, the combination of less rural uses and more aggressive groundwater policies would further reduce these impacts. Although this impact would be significant, it would be less than what would occur under the *Draft GP 2020*.

Impact 4.5-6 Saltwater Intrusion

The Mitigated Alternative would result in a significant impact to groundwater resources from saltwater intrusion. Existing saltwater intrusion problems would continue to occur under this alternative and perhaps worsen over time. The Mitigated Alternative would afford more protection to groundwater resources and would provide a greater emphasis on coordinated water supply planning and may limit development in areas that are prone to salt water intrusion. Therefore the Mitigated Alternative would result in relatively fewer impacts to groundwater resources from saltwater intrusion than would the *Draft GP 2020*.

Impact 4.5-7 Well Competition and Adverse Well Interference

The Mitigated Alternative would result in a significant impact to groundwater resources from well use. Existing localized problems involving well competition and well interference would continue to occur under this alternative and could worsen over time if competition for groundwater resources between users increases. Policies of the *Draft GP 2020* as well as more restrictive controls over well

development that would be implemented as part of the Mitigated Alternative would afford more protection to groundwater resources. In addition, less agricultural and other rural uses could decrease well competition and interference. Therefore the Mitigated Alternative would have relatively fewer impacts to groundwater resources than would the *Draft GP 2020*.

Impact 4.5-8 Changes to Drainage Patterns Leading to Streambank Erosion

The Mitigated Alternative would result in a significant impact related to streambank erosion due to changes in drainage patterns. Land uses and development consistent with this alternative would result in alterations to drainage patterns and consequently, localized bank instability problems that would not be fully mitigated by *Draft GP 2020* and proposed revisions to County grading and drainage ordinances. However, the Mitigated Alternative would result in less streambank erosion impacts than would the *Draft GP* 2020 because there likely would be less urban and rural use that could affect drainage patterns.

Impact 4.5-9 Increased Flood Risk from Drainage System Alteration

The Mitigated Alternative would result in a less-than-significant impact related to increased flood risk. Existing *General Plan* policies, County drainage ordinances and design guidelines, and CEQA review of discretionary projects involving drainage alteration would continue to adequately reduce this impact. The Mitigated Alternative would also benefit from relatively less drainage alteration from land uses and from flood management policies of the *Draft GP 2020*. Therefore, the Mitigated Alternative would result in relatively fewer impacts related to flooding than would the *Draft GP 2020*.

Impact 4.5-10 Place Housing or Structures in 100-Year Flood Hazard Areas

Similar to the *Draft GP 2020*, the Mitigated Alternative would result in a less-than-significant impact related to 100-year flood hazards. *Draft GP 2020* policies, the County ordinance requiring construction permits in 100-year floodplains, Sonoma County Water Agency design guidelines, and CEQA review of discretionary projects involving drainage alteration would continue to adequately reduce this impact. The Mitigated Alternative would also benefit from relatively less development in 100-year floodplains. Therefore the Mitigated Alternative would result in relatively fewer impacts related to flooding in 100-year flood hazard areas than would the *Draft GP 2020*.

Impact 4.5-11 Impede or Redirect Flows in Flood Hazard Areas

Similar to the *Draft GP 2020*, the Mitigated Alternative would result in a significant impact from flooding as a result of impeded or redirected flows. Land uses and development consistent with the existing *General Plan* could result in localized flooding problems caused by drainage alterations from grading activities that may not be fully mitigated by current policies and County grading and drainage ordinances. Since these policies would be the same as those of the *Draft GP 2020*, flooding impacts from impeded or redirected flows in flood hazard areas under the Mitigated Alternative would be the same as those of the *Draft GP 2020*.

Impact 4.5-12 Failure of Levee or Dam

Similar to the *Draft GP 2020*, the Mitigated Alternative would result in a significant impact from flooding as a result of local levee or dam failure. Except for County built and maintained structures, dam and levee safety is not an area of County administrative authority but rather the responsibility of the agency that built these structures. Since there are no applicable policy differences in this area between the *Draft GP 2020* and the Mitigated Alternative, flooding impacts from dam and levee failure would be the same under each.

BIOLOGICAL RESOURCES

The Mitigated alternative would result in significant impacts to sensitive biological and wetland resources but these impacts would be less than those under the *Draft GP 2020*. Expanded protection for Riparian Corridors and other Biotic Habitat areas would serve to further reduce the likelihood of inadvertent loss or degradation of sensitive resources, and would identify the two Habitat Connectivity Corridors at the north end of the Sonoma Valley and along Blucher Creek between Cotati and Sebastopol. Use standards would be more restrictive than under the *Draft GP 2020*, virtually eliminating exemptions, waivers, and reductions from the standards. Ephemeral streams would also be protected by conservation zones where they feed directly into perennial or intermittent streams. Biotic Habitat protection would be similar to the Draft *GP 2020*, and County permit procedures would rely on prior approvals by State and federal approvals, where applicable. A countywide habitat conservation plan would be initiated.

Impact 4.6-1 Special Status Species

The Mitigated Alternative would result in a significant impact to special-status species. Future land uses and development could extend over known occurrences of special-status plant and animal species, which could be adversely affected by grading and other disturbance. In spite of existing State and federal regulations, there remains a potential for additional loss of unknown populations of special-status species or loss of essential habitat for listed species as a result of activities which are not subject to County permit requirements. Impacts to special-status species associated with increased road and transit improvements and reduced development and land use activities would be fewer under this alternative in comparison to the *Draft GP 2020*. However, because there remains a potential for continued loss of known or unknown populations, this would continue to be a significant impact.

Impact 4.6-2 Sensitive Natural Communities

The Mitigated Alternative would result in a significant impact to special-status species. Additional use restrictions under this alternative would serve to further protect Riparian Corridors and other sensitive habitat compared with the *Draft GP 2020.* Establishing conservation zones for ephemeral streams would serve to further improve protections for habitat and water quality. However, increased construction of road and transit improvements and reduced future development and land uses would still extend over known and unknown occurrences of sensitive natural communities, which could be adversely affected by grading and other disturbance. As with special-status species, potential impacts on sensitive natural communities associated with development and land use activities would be reduced under this alternative in comparison to the *Draft GP 2020*. Because there remains a potential for continued loss of known or unknown occurrences of sensitive natural communities, this would continue to be a significant impact.

Impact 4.6-3 Wetlands

The Mitigated Alternative would result in a less-than-significant impact to wetlands. Additional use restrictions under this alternative would serve to further protect Riparian Corridors and other sensitive habitat compared with the *Draft GP 2020*. Conservation zones for ephemeral streams would serve to further improve protections for habitat and water quality. Regulations and strengthened policies in the *Draft GP 2020*, greater road and transit improvements, and less rural land uses would result in an over all reduction of impacts to wetlands. Such impacts would be fewer under this alternative in comparison to the *Draft GP 2020*.

Impact 4.6-4 Wildlife Habitat and Movement Opportunities

The Mitigated Alternative would result in a significant impact to wildlife habitat and movement opportunities. As with the *Draft GP 2020*, increased construction of road and transit improvements and reduced future land uses and development consistent with this alternative would still result in the collective loss or modifications of existing wildlife habitat. The continued effects of urbanization, roadway expansion, habitat conversion, exclusionary fencing of vineyards and other factors associated with this alternative would all contribute to the loss of connectivity corridors and wildlife habitat and movement opportunities. However, increased protection of stream corridors and other habitats would result in fewer impacts than under the *Draft GP 2020*.

Impact 4.6-5 Conflict with Local Policies or Ordinances

Similar to the *Draft GP 2020*, the Mitigated Alternative would result in a less-than-significant impact. Future land uses and development would be slightly less than what would occur under the *Draft GP 2020*. No significant conflicts with local policies or ordinances would be anticipated, resulting in the same impact as would occur under the *Draft GP 2020*.

Impact 4.6-6 Conflict with Adopted Habitat or Natural Community Conservation Plans

No conservation plans have been adopted encompassing all or portions of Sonoma County. No impact is therefore anticipated under the Mitigated Alternative.

GEOLOGY AND SOILS

Impact 4.7-1 Seismic Ground Shaking

The Mitigated Alternative would result in a significant seismic ground shaking impact, particularly from stronger seismic events. Policies of the existing *General Plan* and current regulations would reduce these impacts under this alternative. However, the Mitigated Alternative would benefit from the additional policies of the *Draft GP 2020* that would provide greater protection against loss or damage resulting from future seismic groundshaking. In addition, this alternative would include less agricultural and other rural uses with structures at risk from earthquakes. Therefore, the Mitigated Alternative would result in relatively fewer impacts from seismic groundshaking than would occur under the *Draft GP 2020*.

Impact 4.7-2 Seismic Related Ground Failure

The Mitigated Alternative would result in a significant seismic related ground failure impact, particularly from stronger seismic events. Policies of the existing General Plan and current regulations would reduce these impacts under this alternative. In addition, the Mitigated Alternative would benefit from the additional policies of the *Draft GP 2020* that would provide greater protection against loss or damage resulting from future ground failure. Furthermore, this alternative would include less agricultural and other rural uses with structures at risk from earthquakes. Therefore, the Mitigated Alternative would result in relatively fewer impacts from seismic related ground failure than would occur under the *Draft GP 2020*.

Impact 4.7-3 Landsliding

The Mitigated Alternative would result in a significant landsliding impact, particularly from heavier rainfall and stronger seismic events. Policies of the existing *General Plan* and current regulations

would reduce these impacts under this alternative. In addition, the Mitigated Alternative would benefit from policies of the *Draft GP 2020* that would provide greater protection against loss or damage resulting from future landslides. In addition, this alternative would include less agricultural and other rural uses with structures at risk from landsliding. Therefore, the Mitigated Alternative would result in relatively fewer impacts from landsliding than would occur under the *Draft GP 2020*.

Impact 4.7-4 Subsidence and Settlement

The Mitigated Alternative would result in a significant subsidence and settlement impact, particularly related to heavier rainfall and stronger seismic events. Policies of the existing *General Plan* and current regulations would reduce these impacts under this alternative. In addition, the Mitigated Alternative would benefit from the additional policies of the *Draft GP 2020* that would provide greater protection against loss or damage resulting from future subsidence and settlement. Furthermore, this alternative would include less agricultural and other rural uses with structures at risk. Therefore, the Mitigated Alternative would result in relatively fewer impacts from subsidence and settlement than would occur under the *Draft GP 2020*.

Impact 4.7-5 Tsunamis and Seiches

Existing policies would reduce many of the adverse effects related to tsunamis and seiches. However, the Mitigated Alternative could result in a significant impact to roads, public facilities, and other County projects particularly related to stronger seismic events. Policies of the existing *General Plan* and current regulations would reduce these impacts under this alternative. In addition, the Mitigated Alternative would benefit from the additional policies of the *Draft GP 2020* that would provide greater protection against loss or damage resulting from future seismic events which trigger tsunamis or seiches. Furthermore, this alternative would include less agricultural and other rural uses with structures at risk from tsunamis and seiches. Therefore, the Mitigated Alternative would result in relatively fewer impacts from tsunamis and seiches than would occur under the *Draft GP 2020*.

Impact 4.7-6 Soil Erosion

The Mitigated Alternative would result in a significant soil erosion impact, particularly from heavier rainfall events. Policies of the existing *General Plan* and current regulations would reduce these impacts under this alternative. In addition, the Mitigated Alternative would benefit from the additional policies of the *Draft GP 2020* that would provide greater protection against soil erosion triggered by future rainfall, particularly heavier rainfall. Although there would be an increase in construction of road and transit improvements, this alternative would include less agricultural and other rural uses which could result in erosion. Therefore, the Mitigated Alternative would result in relatively fewer impacts from soil erosion than would occur under the *Draft GP 2020*.

Impact 4.7-7 Expansive Soils

The Mitigated Alternative would result in a less-than-significant expansive soils impact. Policies of the existing *General Plan* and current regulations would reduce these impacts under this alternative. In addition, this alternative would include less agricultural and other rural uses which could result in structures at risk from expansive soils. Therefore, the Mitigated Alternative would result in relatively fewer impacts from expansive soils than would occur under the *Draft GP 2020*.

Impact 4.7-8 Septic Suitability of Soils

Similar to the *Draft GP 2020*, the Mitigated Alternative would result in a less-than-significant impact related to the septic suitability of soils. Land uses and development consistent with this alternative

could result in the use of septic systems or alternative wastewater systems on soils incapable of supporting their use. However, policies of the existing *General Plan*, applicable codes, and current engineering, structural design, and construction practices would reduce this impact to a less-than-significant level and this impact would be the same as under the *Draft GP 2020*.

Impact 4.7-9 Mineral Resources

Similar to the *Draft GP 2020*, the Mitigated Alternative would result in a less-than-significant impact to mineral resources. Policies of the existing *General Plan* as well as the County's *Aggregate Resource Management Plan* (ARM) would avoid the loss of availability of a known mineral resource. As a result, this impact would be the same as under *Draft GP 2020*.

AGRICULTURAL AND TIMBER RESORUCES

Impact 4.8-1 Conversion of Agricultural Lands to Non-Agricultural Uses

The Mitigated Alternative would result in a less-than-significant impact related to the conversion of agricultural land to non-agricultural uses. Urban Service Boundaries and projected growth would be the same as under the *Draft GP 2020* and result in a similar amount of conversion to urban and / or residential uses within incorporated and unincorporated urban service areas. Rural land uses would be more restricted, thereby reducing conversion to some degree. The additional road improvements under this alternative include some that would traverse agricultural lands, resulting in conversion to non-agricultural use. However, because policies that would protect riparian and other biologically sensitive areas would be more restrictive and further limit agricultural uses in such areas, the Mitigated Alternative would result in more conversion of agricultural land than would occur under the *Draft GP 2020.*

Impact 4.8-2 Agricultural Processing and Support Uses

The Mitigated Alternative would result in a less-than-significant impact related to the loss of agricultural land to agricultural processing and support uses. Less cultivation would occur under this alternative, resulting in less development of agricultural processing and support uses than would occur under the *Draft GP 2020*. Agricultural processing operations would be required to include at least 75 percent of crops from the site or local area. Support uses would be regulated as they would by proposed policies of the *Draft GP 2020*. Policies that would avoid over-concentration of these uses would be implemented. Therefore, the Mitigated Alternative likely would result less agricultural land being taken out of production for these than under the *Draft GP 2020*.

Impact 4.8-3 Agricultural Tourism

The Mitigated Alternative would result in a less-than-significant impact related to the conversion of agricultural land to agricultural tourism uses. These uses would be strongly supported as in the *Draft GP 2020.* Policies that would avoid over-concentration of such development and coordinate special events would be implemented. Agricultural tourism uses would not be allowed on lands designated Rural Residential. Although this alternative would result in a smaller increase in agricultural processing capacity than expected under the *Draft GP 2020*, it is probable that tourism uses would continue to be proposed based upon market demand and not be affected by the reduced processing facilities. As a result, the Mitigated Alternative would result in less agricultural land being taken out of production for these uses as would occur in the *Draft GP 2020*.

Impact 4.8-4 Timberland Conversion

The Mitigated Alternative would result in a less-than-significant impact related to timberland conversion. Under this alternative, timber conversions to non-timber uses would be prohibited except under limited circumstances. Timber harvests outside of the Timber Production District (i.e., occurring on Resource and Rural Development lands) would also be subject to setbacks from neighboring properties. Therefore, this alternative would result in less timber conversion than would the *Draft GP 2020*.

PUBLIC SERVICES

Impact 4.9-1 Insufficient Water Supplies to Meet the Future Water Demand of the Urban Service Areas

The Mitigated Alternative would result in a significant impact to water supplies. Currently, there is not enough information to conclude that sufficient water would be available to meet the future demand of land uses and development consistent with the Mitigated Alternative in all Urban Service Areas (USAs). The Mitigated Alternative would result in the implementation of policies that place a greater emphasis on coordinated water supply planning, increased conservation, and water supply protection. Also, this alternative has fewer land use changes and affordable housing sites. Therefore, the Mitigated Alternative would result in less deficiency in the future water supply than the *Draft GP 2020*.

Impact 4.9-2 Insufficient Water Supplies to Meet the Future Water Demand of Rural Private Domestic, Small Municipal, and Agricultural Wells

Similar to the *Draft GP 2020*, the No Project Alternative would result in a significant impact to well water supplies. As in *Impact 4.9-1*, there is currently not enough information about groundwater supplies to conclude that sufficient water would be available to meet the future demand of all private-domestic, small-municipal, and agricultural wells in rural areas. The Mitigated Alternative would result in the implementation of policies similar to the *Draft GP 2020* that place a greater emphasis on coordinated water supply planning, and increased well monitoring and regulation. In addition, less agricultural and other rural uses would occur. As a result, potential deficiencies in future groundwater supply to rural well users under the Mitigated Alternative would be less than those under the *Draft GP 2020*.

Impact 4.9-3 New or Expanded Water Supply Facilities

Unlike the *Draft GP 2020*, the Mitigated Alternative would result in less-than-significant impact to water supply facilities. Under this alternative, policies pertaining to water supply and water treatment facilities would place greater emphasis on insuring there is adequate capacity prior to extending water service outside of USAs. However, this alternative does not include expansion of wastewater systems to accommodate planned growth. This lack of expansion would substantially reduce construction of new water facilities, in spite of the demand. As a result, the impacts of construction of new facilities would be substantially reduced and would be less than those under the *Draft GP 2020*.

Impact 4.9-4 Increased Wastewater Treatment Demand

The Mitigated Alternative would result in a significant impact to wastewater treatment services. Under this alternative, policies regulating wastewater management services would be the same as in the *Draft GP 2020* except that the policies would restrict the use of package wastewater treatment

plants to agricultural processing and support uses and public use in rural areas. Although development consistent with this alternative would result in the same level of unincorporated population and housing growth as the *Draft GP 2020*, affordable housing sites and land use amendments would not occur. Such development would generate wastewater flows slightly lower than those of the *Draft GP 2020* but would still exceed the treatment capacity of several sanitation districts.

Impact 4.9-5 New or Expanded Wastewater Facilities

The Mitigated Alternative would result in a less-than-significant impact. As described in *Impact 4.9-4 Increased Wastewater Treatment Demand*, increased wastewater flows generated by the Mitigated Alternative would necessitate new or expanded wastewater treatment facilities. However, this alternative assumes that no wastewater system expansion would occur. As a result, the construction of such facilities would not occur and there would be no secondary construction-related impacts.

Impact 4.9-6 Increased Solid Waste Disposal Demand

Similar to the *Draft GP 2020*, the Mitigated Alternative would result in a significant impact to solid waste disposal services. Under this alternative, the CoIWMP would remain the principal planning document for solid waste management in Sonoma County. As development consistent with the Mitigated Alternative would be less than but similar to that of the proposed project, this alternative would generate a solid waste stream similar to the amount under the *Draft GP 2020*.

There is uncertainty in regards to future solid waste disposal capacity as discussed in ***Section 4.9 Public Services***. Delays in the Central Landfill expansion project will require the closure and transportation of solid waste to sites outside the county for several years. Following completion of this project, the Central Landfill is expected to have adequate capacity to serve Sonoma County's solid waste disposal needs until 2015. Additional projects recommended in the CoIWMP may provide sufficient capacity until 2050; however, it is uncertain if such projects are feasible. This impact would be similar to that of the *Draft GP 2020*.

Impact 4.9-7 Increased Demand for Parks and Recreation Services and Facilities

Similar to the *Draft GP 2020*, the Mitigated Alternative would result in a significant impact to parks and recreation services and facilities. Although slightly less than the under the *Draft GP 2020*, land uses and development consistent with this alternative would result in similar impacts to parks and recreation services as that of the proposed project. While full implementation of an Outdoor Recreation Plan could result in the development of parks and recreational facilities sufficient to meet existing park planning guidelines, there is no guarantee that such actions would occur. Development of recommended park and recreation projects could result in similar impacts to the environment from construction related activities as discussed in *Impact 4.9-6 Parks and Recreation Services.*

Impact 4.9-8 Demand for Public Education Services and Facilities

The Mitigated Alternative would result in a less-than-significant impact to public education services and facilities. Population growth consistent with the Mitigated Alternative would generate enrollment numbers and patterns similar to but slightly less than those of the *Draft GP 2020*. Policies of the *Draft GP 2020* that would call for planning of school facilities would also be included. Therefore, the Mitigated Alternative would generate a lesser demand for school services beyond the existing public school capacity that would not exceed the existing public school capacity school so as to require new or expanded public school facilities.

Impact 4.9-9 Increased Demand for Fire Protection and Emergency Services Facilities

The Mitigated Alternative would result in a significant impact to public fire protection and emergency services facilities. Policies governing fire protection services would be the same as those in the *Draft GP 2020*. Current funding trends will likely reduce the number of volunteer fire companies within the unincorporated area. Reduced development consistent with the Mitigated Alternative would result in a reduced demand than under the *Draft GP 2020* but would still exacerbate service level deficiencies and therefore require new or expanded fire protection and emergency services facilities, the construction of which could result in secondary construction-related impacts.

Impact 4.9-10 Wildland Fire Hazards

The Mitigated Alternative would result in a significant impact related to wildland fire hazards. This alternative would result in development of structures located within wildland fire hazard areas, but to a lesser degree as compared to the *Draft GP 2020*. Policies of the *Draft GP 2020* as well as Sonoma County ordinances requiring automatic sprinkler systems in new residential and commercial development would reduce the impact associated with the hazard of wildland fires. Although the impact would be less than that of the *Draft GP 2020*, it would remain significant.

Impact 4.9-11 Demand for Additional Criminal Justice Facilities

The Mitigated Alternative would result in a significant impact to criminal justice facilities. Assuming current Sheriff's Department hiring trends would continue, population growth in the unincorporated area consistent with the Mitigated Alternative would result in a service level of similar to that of the proposed project (i.e., approximately 1.19 deputies per 1,000 residents). In addition, the Mitigated Alternative would result in the demand for new or expanded Sheriff's Department substations and detention facilities, the construction of which could cause significant environmental impacts. However, these impacts would be slightly less than those under the *Draft GP 2020* due to fewer land uses and development.

Impact 4.9-12 Increased Demand for Library Facilities

The Mitigated Alternative would result in a significant impact to library facilities. Population growth consistent with this alternative would require new or expanded County Library facilities to maintain adequate service levels. The construction of such facilities could result in significant environmental impacts. These impacts would be similar to those under the *Draft GP 2020* due to the similar population growth.

Impact 4.9-13 Increased Demand for Human Services Facilities

The Mitigated Alternative would result in a significant impact to County Human Services. Unincorporated population growth consistent with this alternative could exceed the ability of the County's Human Services Department to maintain an acceptable level of service within its present level of funding and facilities and therefore could result in the expansion or construction of new Human Services facilities, the construction of which could cause significant environmental impacts. These impacts would be similar to those under the *Draft GP 2020* due to similar population growth.

CULTURAL RESOURCES

Impact 4.10-1 Historic Resources

The Mitigated Alternative would result in a significant impact to historic resources. However, development consistent with this alternative would likely result in a slightly lower level of disturbance of historic resources than that of the *Draft GP 2020*. While policies of the existing *General Plan* and the Sonoma County Historic Preservation Program would adequately protect designated historic resources, impacts to undesignated historic resources from building or ministerial permits could be significant as under the *Draft GP 2020*. A new ordinance requiring that Unreinforced Masonry Buildings (UMBs) be strengthened and / or reinforced would be considered, adding protection for historic buildings if implemented. Therefore, impacts to historic resources under the Mitigated Alternative would be relatively less than those under the *Draft GP 2020*.

Impact 4.10-2 Archeological and Paleontological Resources and Human Remains

The Mitigated Alternative would result in a significant impact to archeological and paleontological resources. Development consistent with this alternative may decrease the frequency at which such resources would be disturbed as additional policies that would be implemented would reduce some types of land uses and development. While existing policies and procedures (i.e., Northwest Information Center referrals) would likely protect documented archeological and / or paleontological resources, they may not adequately protect previously unidentified resources. Ministerial projects and land use activities not subject to permits (e.g., agricultural cultivation, single family dwellings on existing lots) could disturb such resources as well. As a result, impacts under the Mitigated Alternative still would be significant but less than those under the *Draft GP 2020*.

VISUAL RESOURCES

Impact 4.11-1 Community Separators, Scenic Landscape Units, Scenic Corridors, and Scenic Highways

The Mitigated Alternative would result in a less-than-significant impact to scenic resources in Community Separators, Scenic Landscape Units, Scenic Corridors, and Scenic Highways. Under this alternative, Community Separators would increase in acreage as previously described through the inclusion of all of the SCAOSPD Priority Greenbelts as well as lands between Rohnert Park – Cotati and Penngrove, as well as lands between Cloverdale and Healdsburg. This alternative would also result in the extension of the boundaries of Scenic Landscape Units up to and over the crests of hills and ridges.

Less rural land uses and development of would occur in these areas. In addition, design guidelines included in the *Draft GP 2020* would increase the protection of the visual quality in Community Separators and Scenic Landscape Units.

With respect to Scenic Corridors and Scenic Highways, the impact of land uses and development would be addressed by existing policies in both the Mitigated Alternative and the *Draft GP 2020*. As a result, the overall visual impact of the Mitigated Alternative on designated Scenic Resource areas would be slightly less than that under the *Draft GP 2020*.

Impact 4.11-2 Visual Impacts in Other Urban and Rural Areas

The Mitigated Alternative would result in a less-than-significant impact to other urban and rural areas that are not designated scenic resources. These areas would benefit from the visual protection afforded by the Urban Design and Rural Character policies included in the *Draft GP 2020* and this alternative. In addition, less rural and urban uses would occur. As a result, these impacts would be less than those under the *Draft GP 2020*.

Impact 4.11-3 Light Pollution and Nighttime Sky

The Mitigated Alternative would result in a significant impact related to light pollution and the nighttime sky. Reduced agricultural and other rural and urban land uses in the unincorporated area consistent with the Mitigated Alternative would likely result in fewer visual impacts associated with outdoor lighting (e.g., light trespass, light pollution, and sky glow) than that of the *Draft GP 2020*. However, policies of the Mitigated Alternative would not reduce this impact to a less-than-significant level.

ENERGY

Impact 4.12-1 Energy Consumption from Land Use Locations and Patterns

The Mitigated Alternative would result in a less-than-significant impact related to energy consumption from land use locations and patterns. The existing land use plan would continue to focus future development in a compact manner within or adjacent to existing developed areas. Development which directly supports agricultural production would continue to be located in agricultural areas. This land use pattern would reduce the future reliance upon single occupancy vehicles, a major user of energy.

The Mitigated Alternative would result in the implementation of the proposed energy conservation and demand reduction policies. Such policies promote strategic planning, energy conservation education, energy efficient construction, and alternative fuel use. Therefore, this impact would be the same as that under the *Draft GP 2020*.

Impact 4.12-2 Energy Consumption from Building Construction and Retrofit

The Mitigated Alternative would result in a less-than-significant impact related to energy consumption from building construction and retrofit. Compared to the *Draft GP 2020,* there would likely be a reduced amount of construction of new buildings that require energy for daily operation. Also, policies of the *Draft GP 2020* that would reduce impacts to energy resources from building construction and retrofit would be implemented under this alternative. As a result, energy consumption impacts would be less than those under the *Draft GP 2020*.

Impact 4.12-3 Increased Energy Demand and Need for Additional Energy Resources

The Mitigated Alternative would result in a significant impact related to increased energy demand and the need for additional energy resources. Under this alternative, the increased demand for energy resources through 2020 would be similar to that of the proposed project in that unincorporated population growth and development would be the same, although land uses and development would be slightly less. Additional road and transit improvements would be included that would accommodate automobile travel, as well as bus and transit modes. As the Mitigated Alternative contains policies promoting small-scale decentralized power generation and renewable energy, it may be more effective in stabilizing the regional power supply and diversifying energy production methods. Energy usage

and demand would continue to increase as a consequence of future growth and because automobile travel would continue for some time to be the travel mode of choice. This impact would be less than that under the *Draft GP 2020*.

The Mitigated Alternative would result in the implementation of proposed energy conservation and demand reduction policies contained in the *Draft GP 2020* that promote strategic planning, energy conservation education, energy efficient construction, and alternative fuel use.

HAZARDOUS MATERIALS

Impact 4.13-1 Release of Hazardous Materials

The Mitigated Alternative would result in a less-than-significant impact related to the release of hazardous materials. Policies governing hazardous materials would be the same as those of the *Draft GP 2020*. However, the Mitigated Alternative would result in a reduced amount of transport, use, and disposal, of hazardous materials, which could result in accidental release than under the *Draft GP 2020* due to the relatively fewer land uses which could generate these materials.

Impact 4.13-2 Hazardous Materials, Substances, or Waste near School Sites

The Mitigated Alternative would result in a significant impact related to hazardous materials, substances, or waste near school sites. Slightly reduced land uses and development consistent with the Mitigated Alternative would result in a slightly reduced risk of exposure to hazardous materials in the vicinity of school sites compared with the *Draft GP 2020*.

Impact 4.13-3 Hazardous Materials near Airports

The Mitigated Alternative would result in a less-than-significant impact related to hazardous materials near airports. Discretionary review of projects as well as compliance with the *Comprehensive Airport Land Use Plan* (CALUP) would ensure that this impact would be reduced to a less-than-significant level. The impact would be similar to that of the *Draft GP 2020*.

5.5 ALTERNATIVES CONSIDERED BUT NOT INCLUDED

CEQA directs a lead agency preparing an EIR to analyze a reasonable range of alternatives to the project which would feasibly attain most of the basic project objectives but would avoid or substantially lessen any of the significant effects of the project. The analysis of a range of alternatives is governed by a "rule of reason" that requires an EIR to analyze only those alternatives which could feasibly attain the basic objectives of the project. The following alternatives were determined to be either outside of the scope of the project objectives or infeasible and are not included in this analysis.

As described in ***Section 3.2 Project Objectives and History***, it is not a basic project objective to make changes to the existing land use maps beyond the limitations set forth in the screening criteria approved by the Board of Supervisors. [5] Therefore, alternatives that would accommodate additional

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5 *Screening Criteria for land Use Map Amendments*, CAC memo, Scott Briggs, Sonoma County PRMD, December 13, 2001.

population, housing, and job growth that cannot be accommodated by the existing land use maps would not meet basic project objectives. Any such alternatives are not considered in this EIR.

In addition, alternatives that would accommodate population, housing, and job growth that were greater than the No Project Alternative, but less than the proposed project were considered. These alternatives, however, were also eliminated from further consideration in the EIR for several reasons. First, they would not meet the project objectives as noted above. Second they would not provide any meaningful impact analysis that would distinguish them from the No Project Alternative, since both the No Project Alternative and the proposed project would allow essentially the same level of land use and development. The third reason has to do with the fact that Sonoma County policies favor city-centered growth. Since most future growth is planned within the cities where the County has no jurisdiction, the relatively limited unincorporated area growth would not provide the opportunity to evaluate meaningful differences in the level of development.

The project objectives and alternatives include changes to policies that are within the scope of the issues listed in the General Plan Update work plan. This work plan identified those issues that were identified by the Board of Supervisors for updating and reconsideration in the General Plan Update following extensive community meetings and public input. Issues not included in this work plan were determined to be satisfactorily addressed in the existing *General Plan*. Therefore, any alternatives that would be based upon policy issues that are outside of the scope of the General Plan Update are not considered in this EIR.

An alternative was initially considered that would analyze the impacts of no new development within the unincorporated portion of the county. A "no development" alternative is commonly included in EIRs for proposed development projects because it facilitates a comparison between the project impacts and the impacts if no project is constructed. In the case of a General Plan EIR, however, the project encompasses the sum of all land use and development that may occur in the entire county (and to some extent, the cities within the county). An alternative that assumes no future development in the county, cities, and neighboring counties is extremely unlikely and unrealistic. Moreover it would not provide any meaningful impact comparison for decision-makers. In any case, the environmental setting section of the EIR describes the same environmental conditions as a "no development" alternative would describe. Therefore, this alternative is not analyzed separately in this EIR.

5.6 ENVIRONMENTALLY SUPERIOR ALTERNATIVE

The State CEQA Guidelines require that an EIR's analysis of alternatives identify the "environmentally superior alternative" among all of those considered. Based on a comparison of impacts discussed above and in **Exhibit 5.0-2**, the No Project Alternative and the Buildout Alternatives would result in more severe impacts than the *Draft GP 2020*. The No Project Alternative does not have the benefit of the goals, policies, and programs contained in the *Draft GP 2020*. The increased level of development that would occur under the Buildout Alternative would result in more significant impacts compared to the *Draft GP 2020*. The Mitigated Alternative would include additional policies and programs that would result in fewer significant impacts than the *Draft GP 2020* and therefore would be the environmentally superior alternative. The Mitigated Alternative would have significantly more highway improvements than the *Draft GP 2020,* resulting in less congestion than the other alternatives. However, these improvements may result in additional secondary impacts. The Mitigated Alternative would result in less agricultural cultivation and associated facilities such as agricultural processing and support and agricultural tourism uses than would the *Draft GP 2020*. The reduced agricultural cultivation would result in fewer significant impacts compared to the *Draft GP 2020*.

6.0 IMPACT OVERVIEW

6.0 IMPACT OVERVIEW

6.1 GROWTH INDUCING IMPACTS

CEQA requires that an EIR discuss the ways in which a proposed project could foster population growth or the construction of additional housing in the vicinity of the project and how that growth would, in turn, affect the surrounding environment. Growth can be induced in a number of ways, by eliminating obstacles to growth, or by simulating economic activity within the region. For a general plan, however, the project is a long term plan intended to accommodate projected population, housing and employment growth, including the appropriate balance among these factors with the necessary public services and infrastructure.

The *Draft GP 2020* is a plan to accommodate future projected growth and development in the unincorporated area of Sonoma County. Projected growth is described in ***Chapter 3.0 Project Description*** and the environmental consequences related to the potential growth are fully assessed in ***Chapter 4.0 Environmental Setting, Impacts, and Mitigation Measures***.

Land uses and development consistent with the *Draft GP 2020* would result in additional housing, agricultural, commercial, industrial, and public services and infrastructure development within the unincorporated area. For example, development consistent with the *Draft GP 2020* would result in approximately 7,300 additional housing units in the unincorporated area over existing conditions. However, the amount of additional growth that would be accommodated by the *Draft GP 2020* is essentially the same as the level of growth projected for the existing *General Plan*. So, while the *Draft GP 2020* would be growth inducing to the extent it would accommodate this growth it would not, in and of itself, serve to induce future growth within the unincorporated area of Sonoma County beyond what is currently anticipated. Furthermore, while the *Draft GP 2020* would accommodate this growth, implementation of the proposed goals, objectives and policies would manage this growth in ways that protect the environment and quality of life in Sonoma County.

The goals, objectives, and policies of the *Draft GP 2020* would not provide the stimulus for growth. For example, goal **LU-1** is to accommodate Sonoma County's fair share of future growth in the San Francisco Bay Area region as detailed in the Land Use Element consistent with environmental constraints, maintenance of the high quality of life enjoyed by existing residents, and the capacities of public facilities and services. [1] Objective **LU-1.1** is to correlate development authorized by the land use plan maps with projected population and employment growth. It is the County's objective to provide an adequate but not excessive supply of residential, commercial and industrial lands to accommodate the projected growth and to provide the appropriate balance between employment and housing.

Policies in the Public Facilities and Services Element would generally limit the expansion of water and sewer facilities to accommodate future land uses and development consistent with *Draft GP 2020*. Policies **PF-1f** and **PF-1h** would avoid the extension of public sewer and water service that is outside of either a sphere of influence adopted by LAFCO or an Urban Service Area with certain limited

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[1] Projected population, household, and employment growth are shown in Tables LU-2, LU-5, and LU-6 of the Land Use Element.

exceptions. The exceptions require that the sewer or water facilities be sized to serve development consistent with the general plan. Policy **PF-1k** would permit the approval of new conventional or package sewage treatment plants under certain conditions. The intent of Policy **PF-1k** is that existing and future conventional and package sewage treatment plants would be sized to serve land uses and development consistent with the *GP 2020.*

Adoption of the *Draft GP 2020* would remove infrastructure limitations only to the extent necessary to accommodate planned growth. Adoption of the plan would not remove regulatory constraints that could result in future unforeseen growth. Moreover, adoption of the *Draft GP 2020* would concentrate urban land uses and development in Urban Service Areas. Therefore, while the *Draft GP 2020* could be said to induce some growth by accommodating planned growth, it would not be expected to have negative growth inducing impacts. Impacts associated with projected land uses and development consistent with the *Draft GP 2020* are analyzed in the appropriate sections throughout this EIR.

6.2 CUMULATIVE IMPACTS

Cumulative impacts refer to two or more individual effects that, when considered together, are considerable or which compound or increase other environmental impacts. The individual effects may be changes resulting from a single project or a number of separate projects. The cumulative impacts from several projects is the change in the environment that results from the incremental impacts 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. [2]

In this context, cumulative impacts are those that, if added to the impacts of the *Draft GP 2020*, would increase the severity or the significance of impacts of the *Draft GP 2020.* By requiring an evaluation of cumulative impacts, CEQA attempts to identify environmental impacts which would be ignored due to the project-by-project nature of the project-level analyses contained in EIRs. If a significant cumulative impact is identified, the EIR considers whether the project's contribution to that impact is cumulatively considerable.

This EIR evaluates cumulative impacts under three scenarios. The first are cumulative impacts that would occur in the unincorporated area of Sonoma County under the *Draft GP 2020*. Each of the topical impact assessments in this EIR takes into consideration, where applicable, the cumulative impacts of the *Draft GP 2020*. For these cumulative analyses the geographic area of concern is the unincorporated area of Sonoma County. The analysis of cumulative impacts is, for the most part, limited to development pursuant to the *Draft GP 2020*. Since cumulative development in the unincorporated area is incorporated into the project description itself, the analyses contained in the body of this report take cumulative issues into consideration.

In addition to impacts that are cumulatively significant under the *Draft GP 2020*, there is an additional level of cumulative impact resulting from growth in the unincorporated portion of Sonoma County together with projected growth in each of the nine cities. With respect to some impacts, such as transportation, the analysis also includes growth in adjacent counties. For most of this cumulative analysis, the geographic area of concern is all of Sonoma County.

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2 *CEQA Guidelines,* Section 15355.

Third, this cumulative impact analysis identifies cumulative impacts that may occur as a result of alternative policy decisions available to the County's decision makers as they consider the *Draft GP 2020*. As described ***Chapter 5.0 Alternatives***, the alternatives are distinguished by different policy choices. For example, under Biological Resources, each alternative assumes adoption of different policies and programs, such as the policies regarding riparian corridors. Although a typical cumulative impact analysis would only examine the impact of the proposed project, this EIR provides an additional analysis of the cumulative impacts of these alternative policy choices. The purpose of this additional analysis is to inform the public and decision makers of the impacts of the decisions as early in the review process as possible.

The cumulative impact analysis incorporates the mitigation measures contained in the *Draft GP 2020* in the form of policies and programs. Rather than restating these policies in each impact section, the reader should refer to the project analysis in ***Chapter 4.0 Environmental Setting, Impacts, and Mitigation Measures*** for proposed policies or programs that reduce or avoid cumulative impacts related to the project. In addition, impact analysis presented in that chapter identifies additional mitigation measures that are available to reduce the impacts of the *Draft GP 2020*. These measures would also reduce the applicable cumulative impacts identified in this section and are referenced herein.

Exhibit 6.0-1 shows the existing population in 2000 and the projected population growth through 2020 for the county for each of the nine cities plus the unincorporated area.

Exhibit 6.0-1
Population Growth 2000 - 2020

	Population	
Jurisdiction	***2000***	***2020***
City of Cloverdale USA	7,052	11,200
City of Healdsburg USA	11,253	13,160
Town of Windsor USA	22,744	30,300
City of Santa Rosa USA	165,849	195,300
City of Sebastopol USA	8,108	9,620
City of Rohnert Park USA	42,236	50,400
City of Cotati USA	7,279	9,600
City of Petaluma USA	55,743	64,200
City of Sonoma USA	9,754	14,590
City subtotal	***330,018***	***398,370***
Unincorporated Sonoma County	128,596	147,660
Total	***458,614***	***546,030***

Source: *Sonoma County General Plan 2020 Public Hearing Draft*, PRMD, October 28, 2004.

The starting point for the population growth projections in the *Draft GP 2020* is *Projections 2002*.[3] After a review of the projections and consultation with staff of each of the county's cities, the projections of total population were revised to match city general plans or estimates in Healdsburg, Santa Rosa, Sebastopol, Rohnert Park, and Sonoma.[4] In the nine cities, growth is the result of both new development and annexations of existing development at the edges of the cities. Net population changes in unincorporated areas include losses due to these annexations as well as growth attributable to new development outside of the city Urban Service Areas.

The *Draft GP 2020* projects that the population in Sonoma County would increase from 458,614 in 2000 to 546,030 in 2020, an increase of 87,416 people. Sonoma County's total population within the cities would increase from 330,018 in 2000 to 398,370 residents in 2020, an increase of approximately 68,400 residents. City population would account for 73 percent of total county population. Within the unincorporated area of Sonoma County, the population would increase from 128,596 in 2000 to 147,660 residents in 2020, in increase of approximately 19,100 residents. Unincorporated population would account for 27 percent of total county population.

City growth, which represents most of the future growth in the county, has the potential to impact physical resources such as hydrology and water resources, biological resources, geology, and agricultural resources. For example it has the potential to impact water quality through increased erosion and sedimentation during project construction and also to result in increased runoff and streambank erosion due to changes to existing drainage patterns and increases in impervious surface areas. Another example would be in regard to biological resources. Growth within the cities has the potential to result in the loss of populations or essential habitat for special-status species, the loss of sensitive natural communities, or impacts to wetlands. In regard to agricultural lands, growth and expansion of the nine cities would contribute to the conversion of agricultural lands to non-agricultural uses. City growth would also require public services and infrastructure that may be located in the unincorporated area. For example, the Santa Rosa Subregional Wastewater System, the Sonoma County Water Agency Water Project, Sutter and Sonoma Valley Hospitals, and the SMART passenger rail and US 101 Widening projects primarily serve city growth. The contribution of city growth to impacts from such projects to physical resources cannot be quantified at this time, given the conceptual nature of where future services and infrastructure would be located in the unincorporated area. Nevertheless, given the scale of city growth it is reasonable to assume that such growth between now and 2020 would result in substantial impacts to the county's physical resources.

Growth within the cities and adjacent counties would also substantially contribute to increased traffic volumes on roadways within Sonoma County. The increase in traffic volumes would in turn contribute to an increase in roadway noise levels thus increasing the number of roadway segments adversely affected by noise. In addition to the growth in the cities and adjacent counties, the cumulative impact analysis includes the following "cumulative projects" that are not part of the proposed project, but are in various stages of entitlement. These projects are:

- Graton Rancheria Hotel and Casino
- Sonoma County Airport Master Plan
- Sonoma State University Faculty Housing Project

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3 *Projections 2002*, Association of Bay Area Governments, December 2001.

4 *Sonoma County General Plan 2020 Public Hearing Draft*, Sonoma County PRMD, October 28, 2004, page 26.

It should be noted that these projects are not fully defined as yet, either in size or in location. It is not possible for the county to determine their site specific impacts, due to the evolving project descriptions. As a result, these impacts are analyzed only in general terms.

The cumulative considerations and impacts for each section are summarized below. For each impact area, the discussion below indicates whether cumulative development would have significant cumulative impacts to the environment and whether or not the *Draft GP 2020* would make a cumulatively considerable contribution to these impacts.

LAND USE, POPULATION, AND HOUSING

The cumulative development scenario for land use includes the development allowed under the *Draft GP 2020* together with development in the nine cities. Such growth, particularly in the cities, would result in significant cumulative land use, population, and housing impacts. However, as discussed in ***Section 4.1 Land Use, Population and Housing,*** land uses and development consistent with the *Draft GP 2020* would not induce substantial growth of population within the unincorporated portion of Sonoma County. Nonetheless, when viewed as a contributing factor to the more substantial growth projected to occur in the cities, the proposed project's incremental effects on growth and concentration of population, however small, would be cumulatively considerable.

As the unincorporated area together with the nine cities develop, land use conflicts between agricultural and residential / urban uses could intensify particularly at the fringe of the cities. Although most of this impact would result from city growth, land use and development in the unincorporated area would make a cumulatively considerable contribution to this impact.

Land use incompatibility resulting from additional land uses in the rural area is also identified as a significant impact resulting from the *Draft GP 2020*. Although city growth would not occur in the rural area and would not contribute to this impact, the cumulative projects would increase land use incompatibility. In this case, however, the contribution of the *Draft GP 2020* already would be significant and cumulatively considerable.

As described in ***Chapter 5.0 Alternatives***, land use, population, and housing impacts under each of the alternatives are significant, although minor variations in policies and programs may result in fewer or greater impacts than under the *Draft GP 2020*. As a result, the cumulative impacts would be similar and significant. In addition, each alternative would result in a cumulatively considerable contribution to these impacts.

TRANSPORTATION

As described in ***Section 4.2 Transportation,*** a travel forecast model was used to prepare the traffic projections for this EIR. This modeling effort included both roadway and transit improvements and growth in the unincorporated area of Sonoma County, as projected under the *Draft GP 2020*, as well as projected growth in each of the nine cities and growth outside of Sonoma County. The regional traffic growth in the remainder of the Bay Area was based on information provided by ABAG's *Projections 2002*, the Metropolitan Transportation Commission, and the California Department of Finance (for counties not covered by ABAG). Therefore, the traffic analysis provided in ***Section 4.2 Transportation*** included cumulative development considerations.

Exhibit 4.2-14 shows those roadways that would have a significant impact in 2020 based on adoption and implementation of the *Draft GP 2020* including projected growth in the cities. Due to the uncertain nature and location of the cumulative projects, they were not included in the traffic model, although the Graton Rancheria Hotel and Casino was included in its earlier location on Stony Point Road. As indicated in **Exhibit 4.2-14** growth in the county's nine cities along with growth in the unincorporated area would result in unacceptable levels of service along 27 roadway links, including county and city roadways, State highways, and US 101. These are summarized below:

- Adobe Road west of Corona Road and east of Frates Road
- Arnold Drive north of Watmaugh Road and north of Verano Avenue
- Guerneville Road, east of Frei Road
- Main Street between Old Redwood Highway and Adobe Road, through the community of Penngrove
- Petaluma Boulevard North, North of Skillman Lane
- Petaluma Hill Road from Adobe Road to the Santa Rosa city limits
- Rohnert Park Expressway from Stony Point Road to the Rohnert Park city limits
- Highway 12 in several locations, primarily in the Sonoma Valley
- Highway 37 in several locations
- Highway 116 east of Adobe Road and west of Stony Point Road
- US 101, in several areas between Cotati to north of Windsor
- Highway 121 south of Highway 116 in the south Sonoma Valley

This congestion would also be significant at key intersections in the county and cities, particularly those identified in ***Section 4.2 Transportation***. As discussed in that section, specific mitigation measures identified for each of these significant impacts may be infeasible. Impacts to the roadway and transit system would be a significant cumulative impact and implementation of the *Draft GP 2020* would make a cumulatively considerable contribution to these impacts.

As noted in ***Section 4.2 Transportation***, there are additional mitigation measures available that would further reduce these significant cumulative impacts, namely through the construction of additional road and transit improvements. However, these improvements are not feasible due to lack of financial resources, their environmental impact, and the local community values.

As described in ***Chapter 5.0 Alternatives***, transportation impacts are significant under each of the alternatives due to increased traffic. Each alternative includes variations in future road and transit improvements that would result in variations in the level of congestion on roadway segments and intersections and on the demand for transit services.

Therefore, cumulative traffic impacts under each alternative would be significant, and the contribution from each of the alternatives would be cumulatively considerable. However, the cumulative traffic congestion under the Mitigated Alternative would be less than that under the *Draft GP 2020*, due to the substantial additional road and transit improvements. In contrast, the cumulative traffic congestion under the No Project and Buildout Alternatives would be greater than under the *Draft GP 2020*, due to the relative lack of new improvements to the circulation system.

AIR QUALITY

As discussed in ***Section 4.3 Air Quality***, the land uses and development consistent with the *Draft GP 2020* would result in a significant air quality impact related to the emission of ozone precursors,

odors / toxic air contaminants, and diesel emissions. Particulate emissions and aircraft emissions are identified as less-than-significant impacts.

Growth in the cities and the cumulative projects would contribute to all of these impacts, resulting in a significant cumulative impact on air quality, particularly for those impacts related to automobile traffic. Particulate emissions would increase as a result of wood stove emissions and construction dust in the cities. Aircraft emissions may increase as a result of the Airport Master Plan project, although the uncertain nature of this project's proposed airport operations at this time makes its impact speculative.

As a result, the cumulative air quality impacts would be significant and the *Draft GP 2020* contribution would be cumulatively considerable.

Section 4.3 Air Quality identifies additional policy mitigation measures that would further reduce the impacts of the *Draft GP 2020* related to ozone precursors, diesel truck emissions, and odors and toxic air contaminants. However, these measures would not reduce cumulative impacts to a less-than-significant level.

As described in ***Chapter 5.0 Alternatives***, ozone precursor, odor / toxic air contaminant, and diesel emission impacts under each of the alternatives would be significant, although minor variations in policies and programs may result in fewer or greater impacts. As a result, the cumulative impacts would be similar and significant. In addition, each alternative would result in a cumulatively considerable contribution to these impacts.

NOISE

The analysis of noise impacts that are associated with auto and transit traffic are, in large part, based upon the traffic analysis which considers cumulative development in the unincorporated area of Sonoma County, the nine cities of Sonoma County, and adjacent counties as described above under Transportation. Future land uses and development within the county would result in potential cumulative noise level increases along certain roadway segments and transit routes such as SMART passenger rail. Cumulative impacts associated with these noise sources are significant and the *Draft GP 2020* would make a cumulatively considerable contribution to these cumulative noise impacts.

As described in ***Chapter 5.0 Alternatives***, noise impacts related to vehicle and rail travel under each of the alternatives would be significant. As a result, the cumulative impacts of all of the alternatives would be significant, but the Mitigated Alternative would result in a greater cumulative noise impact than under the other alternatives due to its relatively greater commitment to road improvements and subsequent exposure of more uses to roadway noise. The cumulative impacts of the No Project Alternative and Buildout Alternative would be similar to the *Draft GP 2020*, as the added traffic on existing roadways would be offset by less new roads.

The Air Transportation Element (ATE) of the *Draft GP 2020* would allow increased general aviation and / or commercial operations at county airports. The levels permitted by the *Draft GP 2020* at the Sonoma County Airport would not expand existing noise contours nor increase the noise impact to noise-sensitive uses in surrounding areas, due to the existing ATE policies that limit the total number of annual aircraft operations. However, increased levels of commercial operations that may occur as a result of the update of the Sonoma County Airport Master Plan may increase noise impacts around that airport. The significance of this noise impact is unknown and speculative at this time.

Noise impacts resulting from stationary sources are identified as less-than-significant impacts under the *Draft GP 2020*. It is possible that new noise sensitive land use and development consistent with the *Draft GP 2020* could occur adjacent to existing noise generating land uses at the fringe of the cities, or that new noise generating land uses (e.g., the Graton Rancheria Hotel and Casino) could occur adjacent to noise sensitive uses at the fringe of the cities. Yet these cumulative impacts would also be less-than-significant due to the policies included in the *Draft GP 2020* that would address the noise impacts of new noise generating uses.

As described in ***Chapter 5.0 Alternatives***, impacts related to noise sensitive land uses near noise impacted areas or new noise generating land use in noise impacted areas would not be significant under the Mitigated and No Project Alternatives. However, these impacts would be slightly greater under the Buildout Alternative due to its less restrictive policies and standards than under the *Draft GP 2020*. However, these less restrictive policies would only apply to exterior noise generated in urban areas resulting in a less-than-significant cumulative impact under this alternative.

HYDROLOGY AND WATER RESOURCES

Land uses and development consistent with the *Draft GP 2020*, together with development in the county's nine cities plus the cumulative projects, would result in cumulative hydrology and water resource impacts. As discussed in ***Section 4.5 Hydrology and Water Resources***, land uses and development consistent with the *Draft GP 2020* would result in significant water quality, groundwater, drainage, and flooding impacts. For example, cumulative development in the unincorporated area plus the nine cities would increase demand on groundwater supplies, potentially adversely affecting groundwater conditions. Also, cumulative development would result in alterations to existing drainage patterns and in the placement of structures within 100-year flood hazard areas that could impede or redirect flood flows, resulting in secondary flood damage including bank instability and erosion. The cumulative projects may also contribute to the cumulative hydrologic and water resources impacts, including increased demand on groundwater supplies, alteration of drainage patterns, and increased impervious surfaces. Cumulative development would result in cumulative hydrology and water resource impacts. Land uses and development consistent with the *Draft GP 2020* would make a cumulatively considerable contribution to these cumulative hydrology and water resources impacts.

Section 4.5 Hydrology and Water Resources identifies additional policy mitigation measures that would further reduce the impacts of the *Draft GP 2020* related to water quality, groundwater, drainage, and flooding. However, these measures would not reduce cumulative impacts to a less-than-significant level.

As described in ***Chapter 5.0 Alternatives***, hydrology and water resource impacts (e.g., water quality, groundwater, drainage, and flooding) under each of the alternatives would be significant, although variations in policies and programs may result in fewer or greater impacts than under the *Draft GP 2020*. As a result, the cumulative impacts under each alternative would also be significant. In addition, each alternative would result in a cumulatively considerable contribution to these impacts.

These cumulative impacts would be greater under the No Project and Buildout Alternatives because these alternatives would not benefit from all of the *Draft GP 2020* policies and programs in the Water Resources and Public Safety Elements and because these alternatives would result in more rural and / or urban land uses and development than would occur under the *Draft GP 2020*. Cumulative impacts would be fewer under the Mitigated Alternative due to its more restrictive policies and its relatively fewer land uses and development.

BIOLOGICAL RESOURCES

Land uses and development consistent with the *Draft GP 2020,* together with development in the county's nine cities and cumulative projects, would result in a significant loss of populations or essential habitat for special-status species and loss of sensitive natural communities. These would be significant cumulative impacts. Even with implementation of the proposed policies (as discussed in ***Section 4.6 Biological Resources***), the *Draft GP 2020* would make a cumulatively considerable contribution to cumulative biological resources impacts.

The *Draft GP 2020* would not result in a significant impact to wetlands. However, wetlands within the areas planned for city expansion and in the locations of the cumulative projects may be affected. federal and State regulations, coupled with the *Draft GP 2020* policies, likely would reduce this impact to a less-than-significant level. In this case, the *Draft GP 2020* contribution to this cumulative impact would not be cumulatively considerable.

In addition, land uses and development consistent with the *Draft GP 2020,* together with development in the nine cities and the cumulative projects, would adversely affect wildlife habitat and result in the obstruction of wildlife movement opportunities. This would be a significant cumulative impact. Implementation of the *Draft GP 2020* would make a cumulatively considerable contribution to this cumulative biological resources impact.

As described in ***Chapter 5.0 Alternatives***, biological resource impacts (e.g., to special status species, sensitive natural communities, wildlife habitat movement) under each of the alternatives would be significant, although variations in policies and programs may result in fewer or greater impacts than under the *Draft GP 2020*. As a result, the cumulative impacts under each alternative would be significant. In addition, each alternative would result in a cumulatively considerable contribution to these impacts.

These cumulative impacts would be greater under the No Project and Buildout Alternatives because these alternatives would not benefit from all of the *Draft GP 2020* policies and programs protecting biological resources, and because these alternatives would result in more rural and / or urban land uses and development than would occur under the *Draft GP 2020*. Cumulative impacts would be fewer under the Mitigated Alternative due to its more restrictive policies and its relatively fewer land uses and development.

Wetland impacts are identified as less-than-significant under the Mitigated Alternative and significant under the No Project and Buildout Alternatives due to different policies and the differences in land uses. However, since wetlands could be adversely affected by development in the expansion areas of some cities, wetland impacts would be cumulatively significant under the *Draft GP 2020* and each of the alternatives. As a result, for each alternative, the contribution of the alternative would be cumulatively considerable. These cumulative wetland impacts would be greater under the No Project and Buildout Alternatives than under the *Draft GP 2020* and they would be less under the Mitigated Alternative than under the *Draft GP 2020*.

GEOLOGY / SOILS

As discussed in ***Section 4.7 Geology / Soils***, as population within the unincorporated area of Sonoma County together with the nine cities grows, including growth associated with the cumulative projects, so would the opportunity for geologic and soils hazards (e.g., seismic ground shaking, seismic related ground failure, landsliding, tsunamis and seiches, subsidence and settlement, and expansion of soils).

Implementation of the *Draft GP 2020* policies would reduce the danger from these hazards, however; this would be a significant cumulative impact. In addition, the *Draft GP 2020* contribution to these impacts would be cumulatively considerable. ***Section 4.7 Geology / Soils*** identifies an additional policy mitigation measure that would further reduce the impacts of the *Draft GP 2020* related to seismic ground shaking. However, this measure would not reduce cumulative impacts to a less-than-significant level.

In addition to the above impacts from geologic and soils hazards, land uses and development under the *Draft GP 2020* would have significant soil erosion impacts. Development within the cities and cumulative projects would contribute to this erosion to the extent that any projects are not subject to discretionary project review. This would result in a significant cumulative impact for which the *Draft GP 2020* contribution would be cumulatively considerable. Mineral resource and septic suitability impacts would not be exacerbated by development in the cities or the cumulative projects and no cumulative impact would occur.

As described in ***Chapter 5.0 Alternatives***, geology and soil impacts under each of the alternatives would be significant, although minor variations in policies and programs may result in fewer or greater impacts than under the *Draft GP 2020*. Cumulative impacts under each alternative would be similar and significant. In addition, each alternative would result in a cumulatively considerable contribution to these impacts.

AGRICULTURAL AND TIMBER RESOURCES

As discussed in ***Section 4.8 Agricultural and Timber Resources***, conversion of agricultural land can occur in two ways. First, cities and unincorporated urban areas may grow outward, resulting in loss of farmland on the fringes of these areas. Second, in rural areas, agricultural lands that are currently available for production may be lost to processing and support uses and other rural uses allowed by agricultural zoning. Conversion of agricultural land resulting from the outward expansion of the cities and unincorporated urban areas is identified as a less-than-significant impact due to the existence of city and *Draft GP 2020* policies limiting the extent of such expansions. For the same reasons, this impact is not considered to be a significant cumulative impact.

Loss of agricultural production due to increased processing and support uses, and agricultural tourism or other rural uses, including habitat protection, would not result from growth of the cities or unincorporated urban areas, and would not likely result from the cumulative projects unless the Sonoma State faculty housing project goes forward on agricultural land. Nonetheless, given the extent of agriculturally protected land in the county, this cumulative impact would be less-than-significant.

As described in ***Chapter 5.0 Alternatives***, loss of agricultural land due to conversion to urban uses or to agricultural support and tourism uses under each of the alternatives are less-than-significant, although variations in policies and programs may result in fewer or greater impacts. Cumulative impacts of the project alternatives would also be less-than-significant for the reasons described above. These less-than-significant cumulative impacts would be similar to but slightly greater than under the *Draft GP 2020* with the No Project and Buildout Alternatives due to their less restrictive policies affecting agricultural support and agricultural tourism uses and the likelihood that more rural land uses would occur. Conversely, the more restrictive agricultural processing policies under the Mitigated Alternative would result in relatively less use of productive agricultural land for these uses.

The cumulative loss of agricultural land as a result of biotic habitat protection policies would be greater under the Mitigated Alternative and less under the No Project and Buildout Alternatives due to the differences in Riparian Corridor and Critical Habitat policies in these alternatives.

Timberland conversions that have occurred in Sonoma County from 1989 through 2004 have all occurred in the unincorporated area. [5] Cumulative development within the nine cities would not result in a significant cumulative timberland conversion impact. For the same reason, there would not be a significant cumulative timberland conversion impact under any of the project alternatives.

PUBLIC SERVICES

Cumulative impacts to public services are discussed below.

Water Supply Services

Current and projected water supplies are discussed in ***Section 4.9 Public Services***. Some of the unincorporated USAs receive water from the Sonoma County Water Agency (SCWA) while others are dependent upon surface water or groundwater for water supply. Most new land uses and development in the unincorporated area outside of the USAs, would be dependent on groundwater, as would the majority of new irrigation agriculture. Land uses and development consistent with the *Draft GP 2020*, together with development in the nine cities and the cumulative projects, would result in an increased demand on surface water and groundwater supplies. Future increases in water demand would result from increases in both population growth and agricultural ad other rural uses.

As noted in ***Section 4.9 Public Services***, available future water supplies vary by water provider and by source. For example, surface water supplies for the SCWA system are considered adequate to accommodate demand for those jurisdictions that contract with the SCWA. However, expansion of the delivery system, approval of the Water Project, and obtaining additional water rights must be completed before the available supply can be delivered.

On the other hand, future supplies for cities, districts, and individuals that rely upon groundwater is less certain, and often single water sources are utilized by multiple water users. The *Draft GP 2020* includes numerous policies and programs that would result in comprehensive assessment and management of water sources. However, in light of the current uncertainty regarding the availability of water supplies, this would be a significant cumulative impact and the *Draft GP 2020's* contribution is cumulatively considerable.

This increased demand for water supplies would result in the need for new water supply facilities. As noted above, additional water rights and new facilities would be needed in order for the SCWA to fulfill the water demand from its contractors. Similarly, other water providers serving individual users and urban and rural communities may need new or expanded facilities to serve planned growth. The construction of these facilities may result in significant cumulative environmental impacts, depending upon their location. The construction of these facilities, necessary to serve land uses and development consistent with the *Draft GP 2020* would be cumulatively considerable.

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[5] Nichols • Berman communication with David Schiltgen, Planner III, Sonoma County PRMD, January 2005.

As described in ***Chapter 5.0 Alternatives***, water supply service impacts under each of the alternatives would be significant. Cumulative impacts under each alternative would also be significant, and each alternative would result in a cumulatively considerable contribution to these impacts. Cumulative demand for water supplies and facility needs under the No Project and Mitigated Alternatives would be less than under the *Draft GP 2020*. Neither of these alternatives would include new affordable housing sites that would increase water demand in some urban areas. In addition, the Mitigated Alternative would not provide for expansion of wastewater facilities that would be necessary to accommodate additional urban land uses and development, thereby reducing water demand. Cumulative demand and facility needs under the Buildout Alternative would be greater than under the *Draft GP 2020* due primarily to the additional land uses and development and the increased usage of package treatment plants.

Wastewater Management Services

As discussed in ***Section 4.9 Public Services***, cumulative land uses and development under the *Draft GP 2020*, in the cities, and the cumulative projects could generate wastewater flows that may exceed the treatment capacity of wastewater treatment services in the cities and unincorporated area. This demand may require both construction of new facilities and improvements to existing facilities in the cities and /or in the unincorporated area. In turn, construction of such facilities could result in site-specific impacts. These would be significant cumulative impacts. Land uses and development consistent with the *Draft GP 2020* would make a cumulatively considerable contribution to the increased demand for wastewater services and the need for new or expanded wastewater treatment facilities.

This increased demand for wastewater services would result in the need for new wastewater facilities. As noted above, new facilities would be needed for various providers in order to fulfill the demand from the service areas. Similarly, other wastewater providers serving cities may need new or expanded facilities to serve planned growth. The construction of these facilities may result in significant cumulative environmental impacts in the unincorporated area depending upon their location. The construction of the facilities necessary to serve land uses and development under the *Draft GP 2020* would make a cumulatively considerable contribution to the cumulative impact.

As described in ***Chapter 5.0 Alternatives***, wastewater management service impacts under each of the alternatives would be significant. Cumulative impacts under each alternative would also be significant, and each alternative would result in a cumulatively considerable contribution to these impacts.

Cumulative wastewater service demand and facility needs under the No Project and Mitigated Alternatives would be less than those under the *Draft GP 2020*. Neither of these alternatives would include new affordable housing sites. Since the Mitigated Alternative does not include wastewater facility expansion, the service demand would remain high, but the impacts of facility construction would not occur.

Cumulative wastewater demand and facility needs under the Buildout Alternative would be greater than those under the *Draft GP 2020* due primarily to the additional land uses and development and the increased usage of package treatment plants.

Solid Waste Management

As discussed in ***Section 4.9 Public Services***, land uses and development consistent with the *Draft GP 2020*, together with development in the nine cities and the cumulative projects, would generate solid

waste streams that exceed the disposal capacity of the Sonoma County Central Landfill by 2015. Delayed expansion projects, and the potential infeasibility of recommended projects contained in the Countywide Integrated Waste Management Plan (CoIWMP) means that future landfill capacity is uncertain, resulting in a significant cumulative impact on these services. Land uses and development consistent with the *Draft GP 2020* would make a cumulatively considerable contribution to this solid waste management impact.

Mitigation Measure 4.9-6 would further reduce the impacts of the *Draft GP 2020* related to solid waste management services. However, this measure would not reduce cumulative impacts to a less-than-significant level.

As described in ***Chapter 5.0 Alternatives***, solid waste management impacts under each of the alternatives would be significant. Cumulative impacts under each alternative would also be significant and each alternative would result in a cumulatively considerable contribution to these impacts.

Since solid waste disposal demand and facility needs are similar to those of the *Draft GP 2020*, the No Project and Mitigated Alternatives would result in similar cumulative impacts. However, the additional land uses and development that would occur under the Buildout Alternative would result in a greater cumulative impact than under the *Draft GP 2020*.

Parks and Recreation Services

As discussed in ***Section 4.9 Public Services***, growth in the unincorporated area of Sonoma County plus the nine cities and the cumulative projects would require a total of 8,190 acres of Regional Open Space Parks and 2,730 acres of Community and Regional Parks. This would be an increase of 5,085 acres of Regional Open Space Parks and 1,549 acres of Community and Regional Parks over existing parklands in 2001. In order to meet this demand, additional park and recreational facilities would need to be planned and constructed. Since adequate funding for enough facilities to meet this demand is uncertain, the cumulative impact on parks and recreation would be significant, and the contribution of the *Draft GP 2020* would be cumulatively considerable. However, Sonoma County is currently considering a Draft Outdoor Recreation Plan (ORP). [6] The *Draft ORP* proposes increases in parklands that would meet the cumulative demand for parks and recreation services. If adopted and implemented, a Draft Outdoor Recreation Plan may result in sufficient increases in parklands to meet the cumulative demand for parks and recreation services

The construction of park and recreation facilities could result in significant site specific environmental impacts depending upon the nature and location of each facility. These impacts could be cumulatively significant and the contribution of the *Draft GP 2020* would be cumulatively considerable.

As described in ***Chapter 5.0 Alternatives***, park and recreation impacts under each of the alternatives would be significant. Cumulative impacts under each alternative would also be significant, and each alternative would result in a cumulatively considerable contribution to these impacts. Since parks and recreation services demand and facility needs are similar to *Draft GP 2020*, the No Project Alternative and Mitigated Alternative would result in similar cumulative impacts. However, the additional land uses and development that would occur under the Buildout Alternative would result in a greater impact than under the *Draft GP 2020*.

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6 *Draft Sonoma County Outdoor Recreation Plan*, Sonoma County Regional Parks Department, March 2003.

Public Education Services

As discussed in ***Section 4.9 Public Services***, projections for K-12 students in Sonoma County by the State Department of Finance are expected to decline from 72,597 students in 2003 / 2004 to 71,548 students in 2009 / 2010 before increasing slightly to 72,555 students in 2012 / 2013. Projections beyond 2012 / 2013 are not available. The majority of the student projections derive from existing and future population growth in the cities. Development consistent with the *Draft GP 2020* combined with that of the cumulative projects and the cities would result in a significant cumulative impact on public education services and the need for new school facilities. However, land uses under the *Draft GP 2020* would not generate enough students to increase this demand and would not result in the need for new or expanded public schools. Therefore it would not make a cumulatively considerable contribution to the impact to public education services and facilities.

As described in ***Chapter 5.0 Alternatives***, public education services impacts would be significant under the Buildout Alternative and less-than-significant under the *Draft GP 2020* and the No Project and Mitigated Alternatives. This difference is due to the additional land uses and development that would occur under the Buildout Alternative. This additional development could, in combination with the growth in the cities and the cumulative projects, result in student populations that might trigger additional facility needs and related construction that would be a significant cumulative impact. In this case, the Buildout Alternative contribution to this cumulative impact would be cumulatively considerable.

Cumulative impacts on public education services and facility needs would be significant within the cities under the No Project and Mitigated Alternatives due to the growth in student population. However, land uses in the unincorporated area would not generate enough students to increase the demand or need for new facilities. As a result, these alternatives would not make a cumulatively considerable contribution to this impact.

Fire Protection and Emergency Services

As discussed in ***Section 4.9 Public Services***, land uses and development consistent with the *Draft GP 2020*, together with development in the nine cities and the cumulative projects, would result in a significant cumulative demand for increased fire protection and emergency services facilities. Although several of the cities (i.e., Cloverdale, Healdsburg, Petaluma, Santa Rosa, Sebastopol, and Sonoma) operate independent fire departments the typical response to an emergency call within Sonoma County generally requires the dispatch of multiple agencies in all areas outside the City of Santa Rosa.[7] Land uses and development consistent with the *Draft GP 2020* would make a cumulatively considerable contribution to the demand for additional fire protection and emergency services facilities as well as to impacts related to the construction of new facilities.

Mitigation Measure 4.9-10 would further reduce the impacts of the *Draft GP 2020* related to fire hazards. However, this measure would not reduce cumulative impacts to a less-than-significant level.

As described in ***Chapter 5.0 Project Alternatives***, fire protection and emergency services and facility needs impacts under each of the alternatives would be significant, although minor variations in policies and programs may result in fewer or greater impacts. Cumulative impacts under each

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[7] Nichols • Berman communication with Vern Losh, Director, and Jack Rosevear, Fire Marshall, Department of Emergency Services, September 2004.

alternative would also be significant, and each alternative would result in a cumulatively considerable contribution to these impacts.

These cumulative impacts would be greater under the No Project and Buildout Alternatives than under the *Draft GP 2020*. The primary reason is that these alternatives would not benefit from the more aggressive fire protection policies in the *Draft GP 2020*. In addition, the Buildout Alternative would result in more urban and rural development requiring fire and emergency protection. Cumulative impacts under the Mitigated Alternative would be less than under the *Draft GP 2020* due to reduced rural land uses and more stringent fire service policies.

Criminal Justice Services

As discussed in ***Section 4.9 Public Services***, cumulative development within the cities and the cumulative projects would contribute to the increased demand for new or expanded Sheriff's Department substations, detention facilities, and other criminal justice facilities. The construction of these facilities could result in significant environmental impacts, depending upon their location. This would be a significant cumulative impact. Land uses and development under the *Draft GP 2020* would make a cumulatively considerable contribution to this demand for additional criminal justice facilities, and to the impacts associated with their construction.

As described in ***Chapter 5.0 Alternatives***, criminal justice services and facility needs impacts under each of the alternatives would be significant, although minor variations in policies and programs may result in fewer or greater impacts. Cumulative impacts under each alternative also would be significant and each alternative would result in a cumulatively considerable contribution to these impacts. These cumulative impacts would be similar to those of the *Draft GP 2020* under the No Project Alternative due to similar policies and land uses and development. Under the Buildout Alternative, the demand for criminal justice services and facilities would be greater than under *Draft GP 2020* due to the additional land uses and development that would occur. Demand for new facilities would be less under the Mitigated Alternative due to the reduced level of rural uses that would occur.

Library Services

As discussed in ***Section 4.9 Public Services***, land uses and development consistent with the *Draft GP 2020* together with development in the county's nine cities and the cumulative projects would result in an increased demand for new or expanded County library facilities in order to maintain acceptable service levels. The construction of these facilities could result in significant environmental impacts, depending on their location. This would be a significant cumulative impact. The *Draft GP 2020* would make a cumulatively considerable contribution to the demand for additional library services.

As described in ***Chapter 5.0 Alternatives***, library services and facility needs impacts under each of the alternatives would be significant, although minor variations in policies and programs may result in fewer or greater impacts. Cumulative impacts under each alternative would also be significant, and each alternative would result in a cumulatively considerable contribution to these impacts. These cumulative impacts would be similar those of the *Draft GP 2020* under the No Project Alternative due to similar policies and land uses and development. Under the Buildout Alternative, the demand for library services and facilities would be greater than under the *Draft GP 2020* due to the additional land uses and development that would occur under that alternative. Demand for new facilities would be less under the Mitigated Alternative due to the reduced level of rural uses that would occur.

Human Services

As discussed in ***Section 4.9 Public Services***, land uses and development consistent with the *Draft GP 2020*, together with development in the cities and the cumulative projects would increase the demand for human services and result in significant cumulative impacts from construction of new or expanded human service facilities. Development consistent with the *Draft GP 2020* would make a cumulatively considerable contribution to this demand and to the construction-related impacts.

As described in ***Chapter 5.0 Alternatives***, human services and facility needs impacts under each of the alternatives would be significant although minor variations in policies and programs may result in fewer or greater impacts. Cumulative impacts under each alternative would also be significant, and each alternative would result in a cumulatively considerable contribution to these impacts. These cumulative impacts would be similar to the *Draft GP 2020* under the No Project Alternative due to similar policies and land uses and development. Under the Buildout Alternative, the demand for human services and facilities would be greater than under the *Draft GP 2020* due to the additional land uses and development that would occur. Demand for new facilities would be less under the Mitigated Alternative due to the reduced level of rural uses that would occur.

CULTURAL RESOURCES

The cultural resources analysis considers all land uses and development within the unincorporated area of Sonoma County, the nine cities, the cumulative projects, and the cumulative impacts of such growth on cultural resources. Impacts to cultural resources are typically limited to the proximity of development, thus growth within the boundaries of the nine cities and the cumulative projects could increase the severity of impacts to cultural resources from cumulative development pursuant to the *Draft GP 2020*. Consistent with the *Draft GP 2020*, project sponsors would be required to take appropriate measures to protect or preserve cultural resources affected by individual projects. This would reduce the impacts of cumulative development on these resources. However, many land uses and development do not require permits which would subject them to review and mitigation. Therefore, this would be a significant cumulative impact. The contribution of the *Draft GP 2020* would be cumulatively considerable.

As described in ***Chapter 5.0 Alternatives***, cultural resource impacts under each of the alternatives would be significant and policies and programs are the same under each alternative. Cumulative impacts under each alternative would also be similar and significant, and each alternative would result in a cumulatively considerable contribution to these impacts.

Section 4.10 Cultural Resources identifies additional policy mitigation measures that would further reduce the impacts of the *Draft GP 2020* and its alternatives related to historic, archaeological, and paleontological resources. However, these measures would not reduce cumulative impacts to a less-than-significant level.

VISUAL RESOURCES

Land uses and development consistent with the *Draft GP 2020* could impact the visual quality of Community Separators, Scenic Landscape Units, Scenic Corridors and Scenic Highways. As discussed in ***Section 4.11 Visual Resources***, policies contained in the *Draft GP 2020* and the Sonoma County Code would continue to strictly limit the intensity, density, and location of development within these areas. Land uses and development consistent with the *Draft GP 2020*, therefore, would not

result in significant visual impacts on these lands. Land uses and development within the nine cities plus the cumulative projects could combine with the *Draft GP 2020* to increase the severity of impacts to visual quality within the Community Separators, Scenic Landscape Units, Scenic Corridors, and Scenic Highways. However, the impact from the cities would be limited to portions of Scenic Corridors and Scenic Highways on the fringe of cities. As a result, the cumulative impacts would be less-than-significant.

Land uses and development from the *Draft GP 2020*, the nine cities, and the cumulative projects would result in a significant cumulative impact in the visual quality of county lands that are not designated Scenic Resources, including impacts from light pollution. This impact could be particularly significant in areas where development in a city and the county are located such that the visual quality of development and light pollution are combined. Although policies and programs in the *Draft GP 2020* would reduce these impacts, these impacts would still be cumulatively considerable.

As described in ***Chapter 5.0 Alternatives***, the visual impacts of the *Draft GP 2020* and each of the alternatives differ depending upon the policies and programs and extent of land uses and development that would occur. As a result, the cumulative impacts resulting from the implementation of each alternative also differ. The No Project Alternative would combine with cities and cumulative projects and result in a less-than-significant cumulative impact on visual resources within designated scenic resource areas. The policies under the No Project Alternative would provide visual protection of these areas that would be similar to that of the *Draft GP 2020*. Rural land uses would be slightly greater than under the *Draft GP 2020*, resulting in a slightly greater visual impact, but the impact would remain less-than-significant.

However, cumulative visual impacts under the Buildout Alternative would be significant and this alternative would make a cumulatively considerable contribution to visual impacts in scenic resource areas. The additional land uses and development that would occur under this alternative, coupled with the less restrictive visual protection policies and the impacts of city development near designated scenic resources are the main reason that this impact would be significant and would be greater than the cumulative impacts under the *Draft GP 2020*.

Similar to the *Draft GP 2020* and the No Project Alternative, cumulative visual impacts in scenic resource areas would be less-than-significant under the Mitigated Alternative. Development standards would be more restrictive than under the *Draft GP 2020* and rural uses would be fewer in these areas, resulting in greater protection of visual quality.

As described in ***Chapter 5.0 Alternatives***, cumulative visual impacts in areas that are not designated as scenic resources also differ under each alternative, depending upon the policies and programs and extent of land uses and development that would occur. Cumulative visual impacts in these areas would be significant under the No Project Alternative and Buildout Alternative due to the lack of lighting and glare, urban design, and rural character policies. The Buildout Alternative would also result in more development. As a result, the contribution of these alternatives to visual impacts would be cumulatively considerable and these cumulative impacts would be greater than under the *Draft GP 2020*.

The Mitigated Alternative, however, would result in a less-than-significant cumulative visual impact because it would include greater visual protection under the above policies. In addition, this alternative would include more land designated as scenic resources and subject to development standards protecting visual quality than would the *Draft GP 2020*. As a result, these cumulative impacts would be less-than-significant and less than under the *Draft GP 2020*.

ENERGY

As discussed in ***Section 4.12 Energy***, land uses and development consistent with the *Draft GP 2020* could substantially increase the demand for and consumption of energy resources. Although energy impacts related to land use patterns, energy efficiency in new construction and building retrofits, would be less-than-significant, the increased demand for energy as a result of future land uses and development consistent with the *Draft GP 2020* would be significant. Cumulative development in the cities and cumulative projects would result in a significant cumulative increase in the demand for energy and the *Draft GP 2020* would make a cumulatively considerable contribution to this impact.

As described in ***Chapter 5.0 Alternatives***, energy impacts resulting from land use patterns and construction would be less-than-significant under each alternative. The only exception is under the Buildout Alternative where the additional construction would result in a significant impact. However, energy demand as a result of future land uses and development in the cities and cumulative projects would be significant under all three alternatives and each of the alternatives would make a cumulatively considerable contribution to the impact. The No Project Alternative and the Buildout Alternative would result in greater cumulative energy demand impacts than under the *Draft GP 2020* due to the less aggressive energy conservation policies and the greater amount of rural land uses. The Mitigated Alternative would result in a similar, but slightly less cumulative energy demand due to the reduced rural and urban land uses than under the *Draft GP 2020*.

HAZARDOUS MATERIALS

As discussed in ***Section 4.13 Hazardous Materials***, land uses and development consistent with the *Draft GP 2020* would result in a significant impact related to hazardous materials near school sites. Otherwise, hazardous materials impacts under the *Draft GP 2020* would not be significant. City and cumulative project land uses and development could result in additional transport and / or release of hazardous materials in the unincorporated area, and would result in an increased likelihood that the location of hazardous materials uses could occur near schools in the county. Similarly, hazardous materials generated in the county could be released in the cities and / or hazardous materials sites could be located near city schools.

Existing regulations and the *Draft GP 2020* policies and programs would reduce the cumulative impacts associated with release / transport of hazardous materials to a less-than-significant cumulative impact. However, the potential for location of hazardous materials uses near school sites would remain cumulatively significant and the *Draft GP 2020* contribution would be cumulatively considerable. The additional policy mitigation measures identified in ***Section 4.13 Hazardous Materials*** would reduce the contribution of the *Draft GP 2020* to a less than cumulatively considerable level, because hazardous materials uses near school sites would be partially addressed as part of County development review. However, the cumulative impact would remain significant.

As described in ***Chapter 5.0 Alternatives***, the hazardous materials impacts of the alternatives are similar to those under the *Draft GP 2020*. Each alternative would have a less-than-significant impact regarding the release / transport of hazardous materials in general and near airports. In addition, each alternative would have a significant impact regarding the location of hazardous materials uses near school sites, and each would make a cumulatively considerable contribution to this impact. For the reasons described above, all of the alternatives would result in a significant cumulative impact regarding hazardous materials near school sites.

The No Project Alternative and the Buildout Alternative would result in a slightly greater cumulative impact regarding this impact than under the *Draft GP 2020*, due to the lack of policies and greater amount of rural land uses and / or development. The Mitigated Alternative would have a similar cumulative impact to that of the *Draft GP 2020* due to its similar policies. The fewer land uses under this alternative likely would not affect the specific demand for hazardous materials sites.

In the case of each of these alternatives, additional policy mitigation measures identified in ***Section 4.13 Hazardous Materials*** could be adopted that would reduce the alternative's contribution to this cumulative impact to a less-than-significant level.

6.3 SIGNIFICANT UNAVOIDABLE IMPACTS

This section identifies project impacts that could not be eliminated or reduced to a less-than-significant level by mitigation measures that are part of the *Draft GP 2020* or other mitigation measures recommended in this EIR. These impacts are described in detail in ***Chapter 4.0 Environmental Setting, Impacts, and Mitigations Measures***.

4.1-2 Land Use Conflicts between Agricultural and Residential / Urban Uses

Implementation of the *Draft GP 2020* would result in the intrusion of residential uses into agricultural areas thereby exposing residents to noise, odors, dust, and similar nuisances associated with agricultural operations. Such residential development may be incompatible with agricultural operations. Urban uses at the fringe of cities and the unincorporated communities may also encounter these agricultural operations. Both residential intrusion and urban uses at the fringe may result in land use conflicts and land use incompatibility. While the *Draft GP 2020* and the Sonoma County Code contain policies and ordinances to reduce this impact, this would be a significant impact.

4.1-3 Incompatible Land Uses in the Rural Area

Land uses and development consistent with the *Draft GP 2020* would result in changes in land use type, density, and scale within rural areas and generate land use incompatibilities. While policies and programs contained in the *Draft GP 2020* would reduce such incompatibilities, this would be a significant impact.

4.2-1 Congestion on Local County and City Roadway Segments

Land uses and development consistent with the *Draft GP 2020*, the cities, and implementation of proposed transportation improvements would result in unacceptable LOS along several local city and county roadways.

4.2-2 Congestion on State Highways

Land uses and development consistent with the *Draft GP 2020* and implementation of proposed transportation improvements would result in unacceptable LOS along several locations on State Highways.

4.2-3 Congestion on Portions of US 101 in Several Areas between Cotati to north of Windsor

Land uses and development consistent with the *Draft GP 2020* and implementation of proposed transportation improvements would result in unacceptable LOS along portions of US 101.

4.2-4 Congestion at Key Intersections throughout the County

Land uses and development consistent with the *Draft GP 2020* and implementation of proposed transportation improvements would result in unacceptable LOS at several key intersections.

4.3-1 Increased Emissions of Ozone Precursors

Land uses and development consistent with the *Draft GP 2020* would result in increased emissions of ozone precursors resulting primarily from vehicles. The increase of emissions within the NSCAPCD would be a less-than-significant impact. However, within the jurisdiction of the BAAQMD, the increased emissions would exceed the District's Clean Air Plan thresholds.

4.4-1 Increased Traffic Noise

Land uses and development consistent with the *Draft GP 2020* would result in increased traffic which in turn would result in a significant increase in noise along certain roadway segments.

4.4-3 Increased Rail Noise

Existing noise sensitive land uses could be exposed to substantially increased noise levels from rail activity.

4.5-3 Water Quality – Agricultural and Resource Development Uses

Agricultural and resource development (i.e., timber harvesting and mineral resources extraction) land uses consistent with the *Draft GP 2020* could result in an increase in sediment and nutrients in downstream waterways.

4.5-5 Groundwater Level Decline

Land uses and development consistent with the *Draft GP 2020* would increase demand on groundwater supplies and could therefore result in the decline of groundwater levels.

4.5-7 Well Competition and Adverse Well Interference

Land uses and development consistent with the *Draft GP 2020* could result in an increase in the number of private wells in unincorporated areas of the county. Approval of wells in Class I or Class II areas could result in well interference impacts.

4.5-8 Changes to Drainage Patterns Leading to Streambank Erosion

Land uses and development consistent with the *Draft GP 2020* would result in alterations to existing drainage patterns. Such changes would increase erosion, both in overland flow paths and in drainage swales and creeks.

4.5-11 Impede or Redirect Flows in Flood Hazard Areas

The placement of land uses and development, particularly structures, within 100-year flood hazards areas, could impede or redirect flood flows, resulting in secondary flood damage including bank instability and erosion.

4.6-1 Special Status Species

Land uses and development consistent with the *Draft GP 2020*, could result in loss of populations or essential habitat for special-status species.

4.6-2 Sensitive Natural Communities

Land uses and development consistent with the *Draft GP 2020* could result in loss of sensitive natural communities.

4.6-4 Wildlife Habitat and Movement Opportunities

Land uses and development consistent with the *Draft GP 2020* would result in a reduction of existing wildlife or fish habitat, contribute to habitat fragmentation, and result in obstruction of movement opportunities. Aspects of the applicable policies contained in the *Draft GP 2020* would serve to partially address these impacts, but the conversion, fragmentation, and obstruction would be a significant impact.

4.7-1 Seismic Ground Shaking

Land uses and development consistent with the *Draft GP 2020* would expose people or structures to substantial adverse seismic effects, including the risk of loss, injury, or death involving strong seismic groundshaking.

4.7-2 Seismic Related Ground Failure

Land uses and development consistent with the *Draft GP 2020* would expose people or structures to potential substantial adverse seismic effects, including the risk of loss, injury, or death from seismic-related ground failures such as surface fault rupture, lateral spreading, lurching, differential settlement, and flow failures. While the policies included in the *Draft GP 2020* would reduce most impacts to an acceptable level, seismic related ground failure impacts related to roads, public facilities, and other County projects would remain significant.

4.7-3 Landsliding

Land uses and development consistent with the *Draft GP 2020* would expose people and structures to substantial damaging effects of landsliding, including the risk of loss, injury, or death from down slope earth movement that may be slow or rapidly occurring. This kind of geologic hazard can be caused by earthquake, seasonal saturation of the soils and rock materials, erosion, or grading activities.

4.7-4 Subsidence and Settlement

Land uses and development consistent with the *Draft GP 2020* could expose property and structures to the damaging effects of ground subsidence hazards. This kind of geologic hazard can be seismically trigged (liquefaction), caused by seasonal saturation of the soils and rock materials, or caused by grading activities.

4.7-5 Tsunamis and Seiches

Land uses and development consistent with the *Draft GP 2020* could expose people and structures in limited areas of the county to potential, substantial adverse seismically caused flooding and strong tidal effects, including the risk of loss, injury, or death. While the policies included in the *Draft GP 2020* would reduce impacts to an acceptable level, tsunami and seiche impacts related to roads, public facilities, and other County projects would be significant.

4.7-6 Soil Erosion

Erosion can result in the loss of agricultural soil resources, as well as expose improvements to erosion-related damage such as undermining and settlement, and in severe cases can progress to landsliding.

4.9-1 Insufficient Water Supplies to Meet the Future Water Demand of the Urban Service Areas

Land use and development consistent with the *Draft GP 2020* would increase the demand for water. As a result, insufficient water supplies would be available to serve some of the unincorporated USAs from existing entitlements. New or expanded entitlements would be required.

4.9-2 Insufficient Water Supplies to Meet the Future Water Demand of Rural Private Domestic, Small Municipal, and Agricultural Wells.

Land uses and development consistent with the *Draft GP 2020* would result in an increased demand on groundwater supplies for rural uses. Due to the lack of comprehensive information regarding the county's groundwater resources, it is uncertain if groundwater supplies would be sufficient to meet the future demand of rural private domestic, small municipal, and agricultural wells. This uncertainty combined with the current regulatory approach could result in insufficient groundwater supplies in rural areas of the county.

4.9-3 New or Expanded Water Supply Facilities

Land Uses and development consistent with the *Draft GP 2020* could result in the need for increased water supply facilities, either through the construction of new facilities or through the expansion or retrofitting of existing facilities. Construction of new or expanded water supply facilities could result in site-specific impacts, especially on aquatic organisms and fisheries.

4.9-4 Increased Wastewater Treatment Demand

Land uses and development consistent with the *Draft GP 2020* would generate wastewater flows that exceed treatment capacity of wastewater treatment services and would require both construction of new facilities and improvements to existing facilities.

4.9-5 New or Expanded Wastewater Facilities

Land uses and development consistent with the *Draft GP 2020* could result in the need for increased wastewater facilities, either through the construction of new facilities or through the expansion or retrofitting of existing facilities. Construction of these facilities could result in site-specific impacts.

4.9-6 Increased Solid Waste Disposal Demand

Land uses and development consistent with the *Draft GP 2020* would generate solid waste streams that would exceed the disposal capacity of the Sonoma County Central Landfill. After this date, the transport of solid waste to landfills outside of Sonoma County with sufficient permitted capacity would commence. Due to the lack of certainty regarding the county's future landfill capacity, this would be a significant impact.

4.9-7 Increased Demand for Parks and Recreation Services and Facilities

Implementation of the *Draft GP 2020* would require new or expanded Community and Neighborhood Parks. Regional Recreation Areas, and Regional Open Space Parks in order to achieve recognized park planning standards. The construction of these facilities could result in adverse physical effects on the environment.

4.9-9 Increased Demand for Fire Protection and Emergency Service Facilities

Implementation of the *Draft GP 2020* would increase the demand for fire protection and emergency services and require the construction of new or expanded fire protection and emergency services facilities.

4.9-10 Wildland Fire Hazards

Implementation of the *Draft GP 2020* would expose people or structures to risk of loss, injury, or death involving wildland fires.

4.9-11 Demand for Additional Criminal Justice Facilities

Implementation of the *Draft GP 2020* would increase the demand for new or expanded Sheriff's Department substations and detention facilities the construction of which could cause significant environmental impacts.

4.9-12 Increased Demand for Library Facilities

Implementation of the *Draft GP 2020* would result in the demand for new or expanded County Library facilities in order to maintain acceptable service levels.

4.9-13 Increased Demand for Human Services Facilities

Implementation of the *Draft GP 2020* could exceed the ability of the County's Human Services Department to maintain an acceptable level of service within its present level of funding and facilities and therefore could result in the expansion or construction of new Human Services facilities.

4.10-2 Archeological and Paleontological Resources and Human Remains
Land Uses and development consistent with the *Draft GP 2020* could result in the disturbance of subsurface archeological and paleontological resources as well as human remains, including those interred outside of formal cemeteries.

4.11-3 Light Pollution and Nighttime Sky
Land uses and development consistent with the *Draft GP 2020* would generate additional sources of lighting which could result in sky glow, light trespass, and glare.

4.12-3 Increased Energy Demand and Need for Additional Energy Resources
Future land uses and transportation systems could substantially increase the demand for energy resources and the need for additional energy resources to meet this demand.

6.4 SIGNIFICANT IRREVERSIBLE ENVIRONMENTAL CHANGES

CEQA requires that significant irreversible environmental changes caused by a plan must be addressed in an EIR. Specifically, the EIR must consider whether "uses of non-renewable resources during the initial and continued phases of the project may be irreversible since a large commitment of such resources makes removal or non-use thereafter unlikely." [8] *Nonrenewable resources*, in this discussion, refer to the physical features of the natural environment, such as land, air, and waterways.

The land use designations proposed by the *Draft GP 2020* would result in commitment of these areas to the designated uses for the foreseeable future. Additionally, amendments in the *Draft GP 2020* would allow the development of differing uses that may not have been previously anticipated by the existing *General Plan*. However, as discussed in ***Section 4.1 Land Use, Population, and Housing***, the proposed Land Use Amendments would not result in significant changes to land use designations from the existing *General Plan*.

Additionally, irreversible changes would likely occur due to future excavation, grading, and construction activities associated with uses permitted by the *Draft GP 2020.* Although these changes can generally be addressed by mitigation measures, the potential for disturbance would represent an irreversible change. The *Draft GP 2020* would also result in irreversible changes by increasing densities and introducing development onto the remaining sites that are designated for use, but that are presently undeveloped.

Land uses and development consistent with the *Draft GP 2020* would result in changes to traffic and circulation, and would thus increase air pollution and noise emissions. Other irreversible changes associated with the *Draft GP 2020* would be the future use of non-renewable resources during construction, including concrete, glass, plastic, and petroleum products. Operation of future uses would also consume energy as well as water.

Land uses and development consistent with the *Draft GP 2020* as well as policies to protect biological resources would result in the conversion of agricultural lands. Although the conversion of agricultural lands as the result of implementation of the *Draft GP 2020* would be a small percentage of the

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8 *CEQA Guidelines,* Section 15126.2(c).

County's inventory of land available for agriculture, any conversion of agricultural lands would be a significant irreversible environmental change.

7.0 APPENDICES

7.0 APPENDICES

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Department of Transportation and Public Works

Airport Division

John Stout – Airport Director

Integrated Waste Division

Ken Wells – Integrated Waste Manager
Lesli Daniel – Household Hazardous Waste Program Manager
Donna Caldwell

Sonoma County Grape Growers Association

Nicholas Frey

Sonoma County Office of Education

Patty Bernstein

Sonoma County Sheriff's Department

Administration Division

Richard Sweeting – Captain

Personnel Service Bureau

Ed Hoener – Sargeant

State of California

California Geological Survey

Geologic Hazards Mapping Program

Chuck Real

State of California (cont.)

Office of State Landscape Architecture

Dennis Cadd, State Scenic Highways Coordinator

North Coast Regional Water Quality Control Board (Region 1)

Mark Bartson

University of California Berkeley

Adina Merenlender

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APPENDIX 7.4 INITIAL STUDY

INITIAL STUDY- SONOMA COUNTY GENERAL PLAN UPDATE (GP 2020)

1. Project Title: Sonoma County General Plan Update (GP 2020)

2. Lead agency name and address: Sonoma County Permit and Resource Management Department (PRMD), 2550 Ventura Ave., Santa Rosa, CA 95403.

3. Contact person and email number: Scott Briggs, Ph.D., Project Manager, sbriggs1@sonoma-county.org.

4. Project location: County of Sonoma

5. Project sponsor's name and address: PRMD, 2550 Ventura Avenue, Santa Rosa, CA 95403.

6. General plan designation: The project itself is an update of the County's General Plan

7. Zoning: Varies throughout the unincorporated areas

8. Description of project: The EIR is being prepared concurrently with the proposed General Plan in order to integrate environmental information into the planning process to the maximum extent feasible. The current General Plan was prepared in 1989. It is available on the County's website (http://www.sonoma-county.org/prmd), as well at the PRMD offices (2550 Ventura Ave, Santa Rosa, California 95403). The work program for the GP 2020 is not a complete update of the entire General Plan, but consists of a policy review that is structured and focused on a list of key issues developed and refined over the past year through an intensive public participation process.

9. Surrounding land uses and setting: As the most northerly of the nine counties in the San Francisco Bay Area, Sonoma County is located along the Pacific coastline about 40 miles north of San Francisco and the Golden Gate Bridge. The county is just over 1500 square miles, making it the largest of the nine counties. A wide number of land uses and environmental settings are encompassed within the county boundaries and beyond. Land uses range from agricultural, residential, commercial, and industrial development. The unincorporated area is predominantly in a natural state, and includes steep mountains and forests, oak trees on rolling hills, grasslands, and wetlands. Sonoma County is bordered by the Pacific Ocean on the west, Marin County and San Pablo Bay to the south, Solano, Napa, and Lake Counties to the east, and Mendocino County to the north. The U.S. Highway 101 Freeway is the major north-south route, connecting the county to San Francisco and Marin County to the south, and to Mendocino County on the north.

10. Other public agencies whose approval is required: The following list is not exhaustive but it is based upon best available information at this time.

    Sonoma County's adoption of an updated General Plan- GP 2020 may result in revisions to the County's Development Code, including the Zoning Ordinance. It is possible that changes could be made to other existing County plans and programs as well, depending on the final adopted provisions of GP 2020. A number of future actions may be based (in whole or part) on the environmental evaluation undertaken as part of GP 2020 and the EIR. Review and approval of subsequent development projects may require review and approval by agencies including, but not limited to, the following.

    - Sonoma County issues changes of zone, specific plans, tentative tract and parcel maps, conditional use permits, and other discretionary development approvals.

    - The U.S. Army Corps of Engineers issues federal 404 permits for individual development projects and public works projects.

    - The Regional Water Quality Control Board, Region 2 issues state National Pollutant Discharge Elimination System (NPDES) permits for individual private development projects and public projects.

    - The California Department of Fish and Game (CDFG) issues state Section 1600 *et seq.* permits for individual private development projects and public works projects.

ENVIRONMENTAL FACTORS POTENTIALLY AFFECTED:

The environmental factors checked below would be potentially affected by this project, involving at least one impact that is a "Potentially Significant Impact" as indicated by the checklist on the following pages.

☒ Aesthetics	☒ Agriculture Resources	☒ Air Quality
☒ Biological Resources	☒ Cultural Resources	☒ Geology / Soils
☒ Hazards & Hazardous Materials	☒ Hydrology / Water Quality	☒ Land Use / Planning
☒ Mineral Resources	☒ Noise	☒ Population / Housing
☒ Public Services	☒ Recreation	☒ Transportation / Traffic
☒ Utilities / Service Systems	☒ Mandatory Findings of Significance	

DETERMINATION: (To be completed by the Lead Agency)

On the basis of this initial evaluation:

☐ I find that the proposed project COULD NOT have significant effect on the environment, and a NEGATIVE DECLARATION will be prepared.

☐ I find that although the proposed project could have a significant effect on the environment, there will not be a significant effect in this case because revisions in the project have been made by or agreed to by the project proponent. A MITIGATED NEGATIVE DECLARATION will be prepared.

☒ I find that the proposed project MAY have a significant effect on the environment, and an ENVIRONMENTAL IMPACT REPORT is required.

☐ I find that the proposed project MAY have a "potentially significant impact" or "potentially significant unless mitigated" impact on the environment, but at least one effect (a) has been adequately analyzed in an earlier document pursuant to applicable legal standards, and (b) has been addressed by mitigation measures based on the earlier analysis as described on attached sheets. An ENVIRONMENTAL IMPACT REPORT is required, but it must analyze only the effects that remain to be addressed.

☐ I find that although the proposed project could have a significant effect on the environment, because all potentially significant effects (a) have been analyzed adequately in an earlier EIR or NEGATIVE DECLARATION pursuant to applicable standards, and (b) have been avoided or mitigated pursuant to that earlier EIR or NEGATIVE DECLARATION, including revisions or mitigation measures that are imposed on the proposed project, nothing further is required.

Signature — Date: JANUARY 3, 2003

SCOTT R. BRIGGS
Printed Name

For

EVALUATION OF ENVIRONMENTAL IMPACTS:

1) A brief explanation is required for all answers except "No Impact" answers that are adequately supported by the information sources a lead agency cites in the parentheses following each question. A "No Impact" answer is adequately supported if the referenced information sources show that the impact simply does not apply to projects like the one involved (e.g., the project falls outside a fault rupture zone). A "No Impact" answer should be explained where it is based on project-specific factors as well as general standards (e.g., the project will not expose sensitive receptors to pollutants, based on a project-specific screening analysis).

2) All answers must take account of the whole action involved, including off-site as well as on-site, cumulative as well as project-level, indirect as well as direct, and construction as well as operational impacts.

3) Once the lead agency has determined that a particular physical impact may occur, and then the checklist answers must indicate whether the impact is potentially significant, less than significant with mitigation, or less than significant. "Potentially Significant Impact" is appropriate if there is substantial evidence that an effect may be significant. If there are one or more "Potentially Significant Impact" entries when the determination is made, an EIR is required.

4) "Negative Declaration: Less Than Significant With Mitigation Incorporated" applies where the incorporation of mitigation has reduced an effect from "Potentially Significant Impact" to a "Less Than Significant Impact." The lead agency must describe the mitigation measures, and briefly explain how they reduce the effect to a less than significant level (mitigation measures from Section XVII, "Earlier Analyses" may be cross-referenced).

5) Earlier analyses may be used where, pursuant to the tiering, program EIR, or other CEQA process, an effect has been adequately analyzed in an earlier EIR or negative declaration. A brief discussion should identify the following:

    a) Earlier Analysis Used. Identify and state where they are available for review.
    b) Impacts Adequately Addressed. Identify which effects from the above checklist were within the scope of and adequately analyzed in an earlier document pursuant to applicable legal standards, and state whether such effects were addressed by mitigation measures based on the earlier analysis.
    c) Mitigation Measures. For effects that are "Less Than Significant With Mitigation Measures Incorporated," describe the mitigation measures that were incorporated or refined from the earlier document and the extent to which they address site-specific conditions for the project.

6) Lead agencies are encouraged to incorporate into the checklist references to information sources for potential impacts (e.g., general plans, zoning ordinances). Reference to a previously prepared or outside document should where appropriate, include a reference to the page or pages where the statement is substantiated.

7) Supporting Information Sources: A source list should be attached, and other sources used or individuals contacted should be cited in the discussion.

8) This is only a suggested form, and lead agencies are free to use different formats; however, lead agencies should normally address the questions from this checklist that are relevant to a project's environmental effects in whatever format is selected.

9) The explanation of each issue should identify:

    a) the significance criteria or threshold, if any, used to evaluate each question; and
    b) the mitigation measure identified, if any, to reduce the impact to less than significance.

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

I (a, b, c, d) Potentially Significant Impact: An analysis of impacts on the visual resources and aesthetic character of Sonoma County will be included in the EIR, including impacts of potential development on the County's scenic resources and rural character. The effectiveness of the Community Separators, Scenic Landscape Units, and Scenic Corridor designations, as well as the Greenbelt areas included in the Sonoma County Agricultural Preservation and Open Space District's *Acquisition Plan 2000*, will be assessed with regard to potential impacts on the quality of scenic views and vistas. The EIR will also address effects associated with an increase of light sources within the County, including light pollution, light trespass, and glare.

II. AGRICULTURE RESOURCES: In determining whether impacts to agricultural resources are significant environmental effects, lead agencies may refer to the California Agricultural Land Evaluation and Site Assessment Model (1997) prepared by the California Dept. of Conservation as an optional model to use in assessing impacts on agriculture and farmland. Would the project:

a)	Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Department, to non-agricultural use?	☒	☐	☐	☐
b)	Conflict with existing zoning for agricultural use, or a Williamson Act contract?	☒	☐	☐	☐
c)	Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland, to non-agricultural use?	☒	☐	☐	☐

II (a,b,c) Potentially Significant Impact: The EIR will evaluate the potential conversion of agricultural land uses to non-agricultural uses. Particular attention will be paid to the conversion of timberland to vineyards, plus conflicts between residential and agricultural land uses. The EIR will also address the increase of visitor serving commercial uses on agricultural land, particularly wineries, as well as conflicts with protected agricultural lands (i.e., under a Williamson Act contract).

III. AIR QUALITY: Where available, the significance criteria established by the applicable air quality management or air pollution control district may be relied upon to make the following determinations. Would the project:

a)	Conflict with or obstruct implementation of the applicable air quality plan?	☒	☐	☐	☐

b)	Violate any air quality standard of contribute substantially to an existing or projected air quality violation?	☒	☐	☐	☐
c)	Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors)?	☒	☐	☐	☐
d)	Expose sensitive receptors to substantial pollutant concentrations?	☒	☐	☐	☐
e)	Create objectionable odors affecting a substantial number of people?	☒	☐	☐	☐

III (a,b,c,d,e) Potentially Significant Impact: The EIR will describe the current baseline air quality, including federal/state attainment status for air pollutants. It will also provide a consistency analysis with population/employment assumptions used in the development of the Clean Air Plans and evaluate General Plan consistency with the regional Transportation Control Measures (TCMs) designated for implementation by counties. The analysis of future air quality impacts will be based on the BURDEN7G program or another method recommended by the respective air districts. Sensitive receptors and objectionable odors will also be addressed. If the project cannot be found consistent with regional Clean Air Plans, additional measures that could be adopted to eliminate the inconsistency will be recommended.

IV. BIOLOGICAL RESOURCES -- Would the project:

a)	Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California of Fish and Game or U.S. Fish and Wildlife Service?	☒	☐	☐	☐
b)	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 of Fish and Game or U.S. Fish and Wildlife Service?	☒	☐	☐	☐
c)	Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?	☒	☐	☐	☐
d)	Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native nursery sites?	☒	☐	☐	☐
e)	Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?	☐	☐	☐	☒
f)	Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan?	☒	☐	☐	☐

IV (a,sb,c,d,f) Potentially Significant Impact: The analysis of biological resources will be based on collecting existing information on the county's biological and wetland resources. This will include material received during the numerous meetings held by the Riparian Corridor / Biological Habitat Subcommittee. As necessary, state, federal, and local wildlife biologists will be consulted to determine concerns or specific knowledge of any sensitive resources of particular concern in the county. The EIR will also provide a discussion of the regulatory framework affecting biological and wetland resources, information on the county's vegetation and wildlife resources, and updated information on special-status species, sensitive natural communities, riparian corridors, and other habitats.

IV (e): No Impact: Sonoma County is evaluating riparian corridor designations and building setbacks as part of GP 2020. Because the General Plan must be, by law, internally consistent, there would be no policies that would conflict with those aimed at protecting biological resources.

V. CULTURAL RESOURCES -- Would the project:

a)	Cause a substantial adverse change in the significance of a historical resource as defined in § 15064.5?	☒	☐	☐	☐
b)	Cause a substantial adverse change in the significance of an archaeological resource as pursuant to § 15064.5?	☒	☐	☐	☐
c)	Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?	☒	☐	☐	☐
d)	Disturb any human remains, including those interred outside of formal cemeteries?	☐	☒	☐	☐

V (a,b,c) Potentially Significant Impact: The analysis of cultural resources in the EIR will include a review of data and the information available from the Office of Historic Preservation, the California Historical Resources Information System, as well as any relevant current cultural studies. The potential impact of GP 2020 on historical and cultural resources will be evaluated

V (d) Less Than Significant Impact with Mitigation Incorporated: The potential exists for uncovering historic human burials that cannot be located during cultural resource site surveys. Destruction or disturbance of such resources could be a potentially significant impact. Implementation of the following mitigation measure will reduce the impacts to less than significant: If human remains are encountered during a public or private construction activity, State Health and Safety Code 7050.5 states that no further disturbance shall occur until the county coroner has made a determination or origin and disposition pursuant to Public Resources Code Section 5097.98. The Sonoma County Coroner must be notified within 24 hours.

If the Coroner determines that the burial is not historic, but prehistoric, the Native American Heritage Commission must be contacted to determine the most likely descendent (MLD) for the area. The MLD may become involved with the disposition of the burial following scientific analysis. Implementation of state law will reduce the potential impact of uncovering human remains to a level of less than significant.

VI. GEOLOGY AND SOILS -- Would the project:

a)	Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving?	☒	☐	☐	☐
b)	Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42.	☒	☐	☐	☐
c)	Strong seismic ground shaking?	☒	☐	☐	☐
d)	Seismic-related ground failure, including liquefaction?	☒	☐	☐	☐

e)	Landslides?	☒	☐	☐	☐
f)	Result in substantial soil erosion or the loss of topsoil?	☒	☐	☐	☐
g)	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?	☒	☐	☐	☐
h)	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?	☒	☐	☐	☐
i)	Have soils incapable of adequately supporting the use of septic tanks or alternative waste water disposal systems where sewers are not available for the disposal of waste water?	☒	☐	☐	☐

VI (all impact categories) Potentially Significant Impact: The EIR will assess the potential geologic, seismic, and soil impacts of GP 2020. This section of the EIR will emphasize geotechnical hazards, faulting and seismic hazards, slope stability and landsliding, and soil hazards including subsidence, expansive soils, and erosion. The focus of this section will be to analyze new information on anticipated ground shaking from seismic events; update information on any revisions to Fault-Rupture Zones in Sonoma County; incorporate information on faults and seismicity from the 1997 Uniform Building Code; and review local effects of recent significant earthquakes.

VII. HAZARDS AND HAZARDOUS MATERIALS -- Would the project:

a)	Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?	☒	☐	☐	☐
b)	Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?	☒	☐	☐	☐
c)	Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?	☒	☐	☐	☐
d)	Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?	☒	☐	☐	☐
e)	For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project result in a safety hazard for people residing or working in the project area?	☐	☐	☒	☐
f)	For a project within the vicinity of a private airstrip, would the project result in a safety hazard for people residing or working in the project area?	☐	☐	☒	☐
g)	Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?	☐	☐	☐	☒

h)	Expose people or structures to a significant risk of loss, injury, or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands?	☒	☐	☐	☐

VII (a,b,c,d,g) Potentially Significant Impact: The EIR will describe the use of hazardous materials and the treatment and disposal of hazardous waste in the county, as well as the state and federal regulations in place. The impacts of GP 2020 in terms of increasing hazardous waste use and exposing new development to soil and groundwater contamination will be analyzed.

VII (e, f) Less than Significant Impact: GP 2020 does not propose any changes to the locations of existing private or public airports, nor the establishment of any new airport. Development in the vicinity of the County's airports will be required to adhere to the provisions of the *Comprehensive Airport Land Use Plan for Sonoma County* (CLUP), 2001, as well as the policies of the pertinent city general plans where airports are near or within city boundaries. The CLUP includes safety as well as noise compatibility standards. While it is anticipated that air traffic generated at airports within the county will increase along with the county's population and employment base, significant safety hazards are not anticipated to result from these increases because of the existing safety provisions in the CLUP. Similarly, projected increases in air traffic generated at county airports are not anticipated to result in any new hazards beyond those addressed in response to questions XI (e) and (f) (noise).

VII (g) No Impact: The County has adopted an *Emergency Operations Plan* (EOP) that provides procedures to be followed in fire response and flood response. The Fire Services Department provides full-time staff to plan check development permits.

VIII. HYDROLOGY AND WATER QUALITY -- Would the project:

a)	Violate any water quality standards or waste discharge requirements?	☒	☐	☐	☐
b)	Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted)?	☒	☐	☐	☐
c)	Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner which would result in substantial erosion or siltation on- or off-site?	☒	☐	☐	☐
d)	Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site?	☒	☐	☐	☐
e)	Create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff?	☒	☐	☐	☐
f)	Otherwise substantially degrade water quality?	☒	☐	☐	☐
g)	Place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map?	☒	☐	☐	☐

h)	Place within a 100-year flood hazard area structures which would impede or redirect flood flows?	☒	☐	☐	☐
i)	Expose people or structures to a significant risk of loss, injury, or death involving flooding, including flooding as a result of the failure of a levee or dam?	☒	☐	☐	☐
j)	Inundation by seiche, tsunami, or mudflow?	☒	☐	☐	☐

VIII (all impact categories) Potentially Significant Impact: GP 2020 will use an integrated, multi-objective watershed and groundwater basin framework to address the management of water resources in the county. The EIR will analyze the environmental impacts of proposed objectives and policies on surface water and groundwater quality, bank erosion and sedimentation, flooding, and the management of water supplies. This will include a discussion of the adequacies of existing policies verses proposed policies in addressing water resource problems. Proposed surface water and groundwater quality objectives and policies will coincide with state and federal regulatory requirements and will address several aspects of development within the county. Bank erosion and sedimentation are important aspects of water quality. Erosion and sedimentation issues will be dealt with through a series of policies related to road construction, agricultural expansion (vineyards), and riparian setbacks.

Flooding issues are generally associated with an increase in impervious surface area and development within the floodplain. Detention and infiltration practices are some of the measures that will be used to address flood problems within the county. Finally, water supplies are derived from both surface water and groundwater sources. Therefore, the policies and objectives for the management of water supplies will vary throughout the county. Changes in water supply management will concentrate largely on the permitting process associated with groundwater well construction and will depend on surrounding land use and hydrogeology.

IX. LAND USE AND PLANNING -- Would the project:

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

IX (a) No Impact: The GP 2020 will not make any major land use plan changes; no communities will be divided.

IX (b.c): The EIR will evaluate the impacts of the projected growth and development under revised plan policies on the existing land use patterns in the county. Also, the consistency of GP 2020 with the land use plans of the county's incorporated cities, applicable Association of Bay Area Government Regional (ABAG) plans, etc. will be addressed.

X. MINERAL RESOURCES -- Would the project:

a)	Result in the loss of availability of a known mineral resource that would be of value to the region and residents of the state?	☒	☐	☐	☐
b)	Result in the loss of availability of a locally-important mineral resource recovery site delineated on a local general plan, specific plan, or other land use plan?	☒	☐	☐	☐

X (a,b) Potentially Significant Impact: Sonoma County contains significant mineral resources that are currently mined in several locations. The EIR will address the potential loss of valuable mineral resources.

XI. NOISE -- Would the project result in?

a)	Exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?	☒	☐	☐	☐
b)	Exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels?	☒	☐	☐	☐
c)	A substantial permanent increase in ambient noise levels in the project vicinity above existing levels without the project?	☒	☐	☐	☐
d)	A substantial temporary or periodic increase in ambient noise levels in the project vicinity above existing levels without the project?	☒	☐	☐	☐
e)	For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?	☒	☐	☐	☐
f)	For a project within the vicinity of a private airstrip, would the project expose people residing or working in the project area to excessive noise levels?	☒	☐	☐	☐

XI (all impact categories) Potentially Significant Impact: The noise analysis of the EIR will repeat the noise measurement program previously used in 1986 to obtain a baseline measurement. This will provide perspective on the effects of changes in land use patterns over the last 15 years in Sonoma County. Newly developed areas will also be evaluated. Twenty-four hour noise measurements and short-term sampling will be performed. The noise exposure inventory will also include new noise measurements and predictions for ten industrial noise sources. Noise modeling for transportation-generated noise will be conducted for various county roadway segments, based on the updated traffic. The new County *Comprehensive Land Use Plan* adopted by the Airport Land Use Commission will include revised noise contours due to revised air traffic forecasts. The proximity of sensitive land uses to excessive noise levels will be analyzed. The effectiveness of current County policies and standards will be evaluated.

XII. POPULATION AND HOUSING -- Would the project:

a)	Induce substantial population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)?	☒	☐	☐	☐
b)	Displace substantial numbers of existing housing, necessitating the construction of replacement housing elsewhere?	☐	☐	☒	☐
c)	Displace substantial numbers of people, necessitating the construction of replacement housing elsewhere?	☐	☐	☒	☐

XII (a) Potentially Significant Impact: The EIR will include forecasts of population, households, and employment, using 2000 Census data as the baseline. Provision for affordable housing and farmworker housing will also be addressed

XII (b,c) Less than Significant Impact: The GP 2020 does not include provisions that will result in the displacement of housing. GP 2020 incorporates the *Sonoma County General Plan Housing Element*, 2002. Moreover, the element contains six detailed programs to increase the supply of affordable housing. Sonoma County has had a long-standing policy of promoting development within urbanized areas rather than allowing sprawl. The existing growth management policies in two of its nine planning areas exempt affordable housing from growth restrictions. These growth management policies have not resulted in the denial of any building permits for either market-rate or affordable housing developments.

XIII. PUBLIC SERVICES

a)	Would the project result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times, or other performance objectives for any of the public services:?	☒	☐	☐	☐
	Fire protection?	☒	☐	☐	☐
	Police protection?	☒	☐	☐	☐
	Schools?	☒	☐	☐	☐
	Parks?	☒	☐	☐	☐
	Other public facilities?	☒	☐	☐	☐

XIII (all impact categories) Potentially Significant Impact: The EIR will evaluate whether forecasted GP 2020 development will result in demand for public services such that new facilities would need to be constructed (with the associated environmental impacts of that). Public service impacts to be analyzed include, law enforcement, fire protection, parks and recreation, public education, and libraries.

XIV. RECREATION

a)	Would the project increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?	☒	☐	☐	☐
b)	Does the project include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment?	☒	☐	☐	☐

XIV (a,b) Potentially Significant Impact: Refer to response for XIII above.

XV. TRANSPORTATION / TRAFFIC -- Would the project:

a)	Cause an increase in traffic which is substantial in relation to the existing traffic load and capacity of the street system (i.e., result in a substantial increase in either the number of vehicle trips, the volume to capacity ratio on roads, or congestion at intersections)?	☒	☐	☐	☐
b)	Exceed, either individually or cumulatively, a level of service standard established by the county congestion management agency for designated roads or highways?	☒	☐	☐	☐
c)	Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks?	☐	☐	☒	☐
d)	Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?	☐	☐	☒	☐
e)	Result in inadequate emergency access?	☐	☐	☐	☒

f)	Result in inadequate parking capacity?	☐	☐	☒	☐
g)	Conflict with adopted policies, plans, or programs supporting alternative transportation (e.g., bus turnouts, bicycle racks)?	☐	☐	☒	☐

XV (a,b) Potentially Significant Impact: The EIR will include an analysis of effects of the proposed land uses on the County's transportation system. This effort will focus on a comparison of potential impacts associated with the proposed project and alternatives to existing baseline conditions for the roadway, transit, bicycle, pedestrian, and aviation components of the transportation system. Base year land use data for 2000 will be collected. A traffic model (TRANPLAN) will be calibrated and validated, and will include analysis of transit use and carpooling. With the updated traffic model, the GP 2020 EIR will provide a complete assessment of the existing levels of service, a baseline for reevaluation of needed improvements, and a basis for policy development. The 2020 travel characteristics of Sonoma County households will be analyzed and the traffic modeling will provide input to the noise and air quality analyses.

XV (c) Less than Significant Impact: GP 2020 does not propose any changes to the locations of existing airports, nor the establishment of any new airports. Development in the vicinity of the County's airports will be required to adhere to the provisions of the *Comprehensive Airport Land Use Plan for Sonoma County* (CLUP), 2001, as well as the policies of the pertinent city general plans where airports are affected by city boundaries. The CLUP includes safety as well as noise compatibility standards. While it is anticipated that air traffic generated at airports within the county will increase along with the county's population and employment base, changes in air traffic patterns are not anticipated to result from these increases. Similarly, projected increases in air traffic generated at county airports are not anticipated to result in any new hazards beyond those addressed in response to XV (e) and (f)) (safety hazards).

XV (d) Less than Significant Impact: All future roadway development occurring pursuant to the provisions of the General Plan will adhere to applicable standards of Sonoma County pertaining to roadway design. Use of roadways within the county will be required to adhere to applicable provisions of the State vehicle and/or streets and highway codes. Adherence to these standards would reduce any potential impacts related to this issue to a less than significant level.

XV (e) No Impact: The roadway network will be designed, constructed, and maintained to ensure that adequate and efficient emergency access is maintained. Future development within the unincorporated areas of the county shall adhere to applicable emergency access/evacuation guidelines promulgated by the County. Therefore, no impacts associated with this issue are anticipated.

XV (f) Less than Significant Impact: All future development projects occurring pursuant to the provisions of the proposed GP 2020 will adhere to the applicable parking standards of the County, as outlined in the Development Code. Adherence to these standards would reduce potential impacts related to this issue to a less than significant level.

XV (g) Less than Significant Impact: Section 65089(b) (A) of the Government Code requires that general plans contain "trip reduction and travel demand element that promotes alternative transportation methods, including but not limited to carpools, vanpools, transit, bicycles, and park-and-ride lots; improvements in the balance between jobs and housing; and other strategies, including but not limited to, flexible work hours, telecommuting, and parking management programs." The Transportation Element of GP 2020 will include provisions for increasing transportation alternatives to automobile use. Also, the Metropolitan Transportation Commission, the regional transportation agency for planning and allocating funding, adopted a Regional Transportation Plan which coordinates regional transportation systems and improvements. All future development projects occurring through the provisions of GP 2020 will adhere to the County and regional policies, plan, and programs in place to support alternative modes of transportation. Adherence to these provisions would reduce potential impacts to below a level of significance.

XVI. UTILITIES AND SERVICE SYSTEMS -- Would the project:

a)	Exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board?	☒	☐	☐	☐
b)	Require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?	☒	☐	☐	☐

c)	Require or result in the construction of new storm water drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?	☒	☐	☐	☐
d)	Have sufficient water supplies available to serve the project from existing entitlements and resources, or are new or expanded entitlements needed?	☒	☐	☐	☐
e)	Result in the determination by the wastewater treatment provider which serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments?	☒	☐	☐	☐
f)	Be served by a landfill with sufficient permitted capacity to accommodate the project's solid waste disposal needs?	☒	☐	☐	☐
g)	Comply with federal, state, and local statutes and regulations related to solid waste?	☐	☐	☐	☒

XVI (a,b,c,d,e,f,) Potentially Significant Impact: The EIR will evaluate whether forecasted GP 2020 development and the alternatives will result in demand for public services such that new facilities would need to be constructed (with the associated environmental impacts of that). Public service impacts to be analyzed include water supply and delivery system, wastewater treatment and disposal, and solid waste disposal.

XVI (g) No Impact: Implementation of the proposed project will result in the development of residential, commercial, industrial, agricultural, and recreational uses, and community and public facilities. The collection and disposal of solid waste will conform to applicable federal, state, and local plans and regulations, including AB 939 (Integrated Waste Management Act) and the *Sonoma County-wide Integrated Waste Management Plan* now being updated. The GP 2020 will contain policies to support the waste management objectives that result from this update.

XVII. MANDATORY FINDINGS OF SIGNIFICANCE

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

XVII (a) Potential to Degrade- Potentially Significant Impact: The GP 2020 has the potential to result in significant impacts on biological and agricultural resources, including the potential to reduce substantially the habitat of certain wildlife and plant species and the loss of important farmland. The EIR will address these issues and any feasible mitigation measures will be identified to avoid and/or reduce any significant impacts.

XVII (b) Cumulative Impacts- Potentially Significant Impact: The GP 2020 will define the extent of future development within the unincorporated areas of Sonoma County. If development with these areas as well as within the incorporated cities were to progress at or near the maximum extent allowed under these agencies' General Plans, considerable cumulative impact may occur and extend beyond the boundaries of the county. Increased traffic is one such anticipated cumulative impact. In addition, it is possible that the impacts of implementing GP 2020 will combine with the impacts of development occurring in surrounding counties to create significant cumulative impacts. An assessment of the cumulative impacts of GP 2020 and adjacent jurisdictions will be conducted, and mitigation measures will be identified in the general Plan EIR to reduce and/or eliminate potentially significant cumulative impacts.

XVII (c) Adverse Impacts on Humans- Potentially Significant Impact: Increases in traffic-related noise and air pollutant emissions, alteration of existing viewsheds, potential seismic and flooding hazards, and the introduction of new lighting and glare sources may have effects on the existing and future residents within the unincorporated portion of Sonoma County. In addition, air pollutant emissions associated with the implementation of the proposed GP 2020 may result in impacts to subregional and/or regional air quality. The EIR will address the severity of these effects generated by the proposed project and identify mitigation measures to reduce and/or eliminate potentially significant impacts.

APPENDIX 7.5 LAND USE AMENDMENT REQUESTS

7.5 LAND USE AMENDMENT REQUESTS

As discussed in ***Chapter 5.0 Alternatives***, the Buildout Alternative would include additional requests to amend the County's land use plan. The following table includes the land use amendment requests submitted during the meetings of the Citizen's Advisory Committee that were considered but not proposed as part of the *Draft GP 2020.* Land Use Amendment requests that would be implemented as part of the *Draft GP 2020* are listed in **Exhibit 4.1-2** in ***Section 4.1 Land Use, Population, and Housing***.

Request No.	Applicant (Owners)	APN (Acres) Location	Land Use Map Amendment Request	Existing Land Use Designation and Use(s)	Existing Zoning	Meets Screening Criteria?	Net Changes if Approved
Cloverdale / NE County Planning Area							
2-1	Hufnagel,Frederic, and Debra	116-240-009 (40.44) Cloverdale	Change land use designation and zoning to RR 3 and AR 3 to increase subdivision and residential development potential.	RR 10 Residential	AR 10	No	+ 9 dwelling units
2-2	Richards	116-240-027 (13.84) Cloverdale	Change land use designation and zoning to RR 5 and AR 5 to increase subdivision and residential development potential.	RR 10 Residential	AR 10	No	+ 1 dwelling unit
2-5	PRMD (Knupfer and Richardson)	115-160-045 (0.35) Cloverdale 115-160-047 (0.53) Cloverdale 115-160-057 (0.34) Cloverdale 115-160-058 (1.57) Cloverdale	Change land use designation and zoning to RR 2 and RR 2 SR.	LC Vacant or Residential	LC SR	Yes, Criterion 2: Non-conforming use	0
2-6	PRMD (Richardson)	115-150-038 (1.62) Cloverdale	Change land use designation and zoning to RR 5 and RR 5 F2.	LI Residential	M1 F2	Yes, Criterion 2: Non-conforming use	0

Request No.	Applicant (Owners)	APN (Acres) Location	Land Use Map Amendment Request	Existing Land Use Designation and Use(s)	Existing Zoning	Meets Screening Criteria?	Net Changes if Approved
2-7	PRMD (Richardson, Calderon, Christ)	115-150-002 (1.04) Cloverdale 115-150-007 (7.48) Cloverdale 115-150-039 (2.95) Cloverdale 115-150-043 (2.32) Cloverdale 115-150-044 (ease) Cloverdale 115-150-052 (5.00) Cloverdale 115-150-054 (ease) Cloverdale 115-150-055 (2.85) Cloverdale 115-150-067 (16.47) Cloverdale	Change land use designation and zoning to RR 5 and RR 5 F2 or RR 5 SR.	LI Residential	M1 F2 RR B8 F2 M1 F2 RR B8 F2 RR B8 F2 M1 F2 M1 F2 M1 SR M1 F2	Yes, Criterion 2: Non-conforming use	0

Request No.	Applicant (Owners)	APN (Acres) Location	Land Use Map Amendment Request	Existing Land Use Designation and Use(s)	Existing Zoning	Meets Screening Criteria?	Net Changes if Approved
2-7 (cont.)		115-150-068 (7.21) Cloverdale			RR B8 F2		
2-8	Hufnagel, Fred and Helen	115-200-003 (107.52) Cloverdale	Change land use designation and zoning to RRD 20 to increase subdivision and residential development potential.	RRD 240 Residential	RRD 240	No	+ 5 dwelling units
2-9	Kuimelis	115-200-004 (45.65) Cloverdale	Change land use designation and zoning to RR or RRD 20 (40 acres) and RR or RRD 5 (5+ acres) to increase subdivision and residential development potential.	RRD 240 Residential	RRD 240	No	+ 2 dwelling units
2-12	Rood	140-170-038 (12.84) Geyserville	Change land use designation and zoning to LIA 20 / UR 4 and LIA 20 / R1 4 du/ac F2 SR (for 11.84 acres / 1.00 acre frontage) to increase subdivision and residential development potential.	LIA 20 Vacant	LIA 20 F2 SR	No	+ 4 dwelling units
2-13	PRMD (New World Manufacturing)	117-040-059 (2.84) Cloverdale 117-040-060 (3.36) Cloverdale	Allow expansion of existing manufacturing facility to adjoining vacant parcel.	LI Vacant	RR B8 SR M1 SR	N/A	0

Request No.	Applicant (Owners)	APN (Acres) Location	Land Use Map Amendment Request	Existing Land Use Designation and Use(s)	Existing Zoning	Meets Screening Criteria?	Net Changes if Approved
2-14	PRMD (Wildease, LLC)	117-010-027 (24.40) Cloverdale	Change land use designation and zoning to RVSC and K.	RRD 40 / RR 2 Dutcher Creek RV Park and Campground	RRD 40 /RR 2	Yes, Criterion 2: Non-conforming use	0
2-17	Lee	116-270-042 (12.11) Cloverdale	Change land use designation and zoning to RRD 3 to increase subdivision and residential development potential.	RRD 20 Residential	RRD B7	No	+3 dwelling units
2-18	Johnson and Barbour	140-070-033 (0.88) Geyserville 140-070-034 (1.32) Geyserville 140-070-035 (0.41) Geyserville	Change land use designation and zoning to GC and C3 F2 SR Z or C3 SR Z to provide tourist, transit, and/or commuter commercial uses.	LEA 20 Vacant	LEA 20 F2 SR Z LEA 20 SR Z LEA 20 SR Z	No	+ 56,845 square feet of commercial space (50% maximum lot coverage).
2-19	Breshears and Hodges	118-110-017 (42.75) Cloverdale	Change land use designation and zoning to RRD 20 and RRD 20 SR to increase subdivision and residential development potential.	RRD 40	RRD 40 SR	No	+1 dwelling unit

Request No.	Applicant (Owners)	APN (Acres) Location	Land Use Map Amendment Request	Existing Land Use Designation and Use(s)	Existing Zoning	Meets Screening Criteria?	Net Changes if Approved
Healdsburg and Environs Planning Area							
3-1	Proctor	110-060-001 (77.91) Healdsburg 110-060-051 (123.91) Healdsburg	Change land use designation and zoning to RRD 40 and RRDWA 40, LEA 40, or LIA 40 to increase residential development potential while allowing for continued agricultural production.	RRD 240 Residential, agriculture	RRDWA 240	No	+ 2 dwelling units
3-2	Banti	066-240-015 (63.16) Windsor	Change land use designation and zoning to DA 20 and DA 20 BR F2 Z to increase subdivision and residential development potential.	DA 40 Residential, vineyard	DA 40 BR F2 Z	No	+ 2 dwelling units
3-3	Buchignani	140-180-061 (3.23) Geyserville	Change land use designation and zoning to UR 12 and R2 12 du/ac to increase subdivision and residential development potential.	RR 1 Residential, nursery	AR 1	No	+ 35 dwelling units
3-7	How	079-220-003 (23.89) Healdsburg	Change land use designation and zoning to RRD 5 and RRD 5 SR to increase subdivision and residential development potential.	RRD 20Vacant	RRD 20 SR	No	+ 3 dwelling units

Request No.	Applicant (Owners)	APN (Acres) Location	Land Use Map Amendment Request	Existing Land Use Designation and Use(s)	Existing Zoning	Meets Screening Criteria?	Net Changes if Approved
Russian River Planning Area							
4-1	Olmstead (Summer Home Park Corporation)	081-250-056 (9.25) Guerneville 081-281-034 (0.41) Guerneville 081-282-039 (0.42) Guerneville	Change land use designation and zoning to one of the following: RVSC and K BR or K BR F1 F2 LC and LC or RC	RR 1.5 Summer Home Park Community Center	RR 1.5 BR F1 F2 RR 1.5 BR RR 1.5 BR	Yes, Criterion 1: Additional RVSC designation And Criterion 2: Non-conforming use	Expansion of existing commercial uses
4-3	Handel	094-160-047 (0.20) Monte Rio	Change land use designation and zoning to GC and C1 F2 SR to increase commercial development potential.	RR 1 / LC Vacant	RR 1 F2 SR / C 1 F2 SR	No	Replace potential residential use with 4,356 square feet of commercial use (50% maximum lot coverage)
4-6	Leonberger and Mozingo	070-120-027 (0.14) Guerneville	Change land use designation and zoning to LC and LC F2 SR. Change land use designation and zoning to RVSC and K F2 SR.	UR 1 Restaurant	R1 1du/ac F2 SR	Yes, Criterion 2: Technical correction And Criterion 2: Non-conforming use	0

Request No.	Applicant (Owners)	APN (Acres) Location	Land Use Map Amendment Request	Existing Land Use Designation and Use(s)	Existing Zoning	Meets Screening Criteria?	Net Changes if Approved
Santa Rosa and Environs Planning Area							
5-1	McIntosh	039-012-057 (21.67) Larkfield	Change land use designation and zoning to UR 20 and R3 20 du/ac to allow for development of affordable housing.	RR 5 Residential	AR 5	Yes, Criterion 1: Housing	+ 429 dwelling units
5-3	Baccala	059-170-025 (6.48) Larkfield	Change land use designation and zoning to UR 20 and R3 20 du/ac SR to allow for development of affordable housing.	RVSC Vacant	K SR	Yes, Criterion 1: Housing	+ 128 dwelling units
5-4	Clemmer	045-033-020 (1.00) Santa Rosa 045-033-039 (1.71) Santa Rosa	Change land use designation and zoning to LI and M3 SR to allow for commercial or industrial development.	RR 10 Residential	AR 10 SR AR 10 SR	Maybe, Criterion 2: Technical correction	Replace residential use with 59,024 square feet of commercial or industrial use (50% maximum lot coverage)
5-5	Trombetta	130-331-010 (10.96) Santa Rosa 130-332-003 (1.24) Santa Rosa	Change land use designation and zoning to RR 2. Change land use designation and zoning to RR 2.	RR 2, DA 10 Vacant DA 10 Vacant, adjacent to golf course	RR 2, DA 10 DA 10	No	+ 1 dwelling unit

Request No.	Applicant (Owners)	APN (Acres) Location	Land Use Map Amendment Request	Existing Land Use Designation and Use(s)	Existing Zoning	Meets Screening Criteria?	Net Changes if Approved
5-SWSR-1	PRMD	045-022-002 (1.00)	Change land use designation and zoning to UR 1 and R1 1du/ac for consistency with City of Santa Rosa VLR land use designation.	LI	M3	Yes, Criterion 2: Technical correction	Replace industrial use with + 1 dwelling unit
5-SWSR-2	PRMD	134-123-016 (6.66)	Change land use designation and zoning to UR 13 and R2 13 du/ac SR for consistency with City of Santa Rosa MR land use designation.	UR 10	R2 10 du/ac SR	Yes, Criterion 2: Technical correction	+ 20 dwelling units
5-SWSR-3	PRMD	134-123-021 (0.52) 134-123-022 (0.73) 134-123-023 (0.77) 134-123-024 (1.46) 134-123-025 (0.50 134-123-037 (1.65)	Change land use designation and zoning to UR 13 and R2 13 du/ac or R2 13 du/ac SR for consistency with City of Santa Rosa MR land use designation.	GC	C2 or C2 SR	Yes, Criterion 2 Technical correction	Replace commercial use with + 70 dwelling units

Request No.	Applicant (Owners)	APN (Acres) Location	Land Use Map Amendment Request	Existing Land Use Designation and Use(s)	Existing Zoning	Meets Screening Criteria?	Net Changes if Approved
5-SWSR-4	PRMD	134-123-004 (2.71) 134-123-031 (1.00) 134-123-032 (1.00) 134-123-033 (1.00) 134-123-034 (2.80) 134-123-042 (0.99)	Change land use designation and zoning to UR 13 and R2 13 du/ac or R2 13 du/ac SR for consistency with City of Santa Rosa MR land use designation.	GI	M1 or M1 SR	Yes, Criterion 2: Technical correction	Replace industrial use with + 122 dwelling units
5-SWSR-5	PRMD	134-132-014 (5.16) 134-132-015 (2.49) 134-132-016 (3.13) 134-132-018 (0.34)	Change land use designation and zoning to UR 13 and R2 13 du/ac for consistency with City of Santa Rosa MR land use designation.	GC	M1 or C2	Yes, Criterion 2: Technical correction	Replace commercial use with + 143 dwelling units
5-SWSR-6	PRMD	134-132-017 (4.10)	Change land use designation and zoning to UR 13 and R2 13 du/ac for consistency with City of Santa Rosa MR land use designation.	GI / GC	M1	Yes, Criterion 2: Technical correction	Replace commercial/ industrial use with + 52 dwelling units

Request No.	Applicant (Owners)	APN (Acres) Location	Land Use Map Amendment Request	Existing Land Use Designation and Use(s)	Existing Zoning	Meets Screening Criteria?	Net Changes if Approved
5-SWSR-7	PRMD	134-132-021 (1.33) 134-132-022 (1.12) 134-132-049 (0.61) 134-132-063 (0.96)	Change land use designation and zoning to UR 20 and R3 20 du/ac for consistency with City of Santa Rosa MHR land use designation.	UR 10	R2 10 du/ac	Yes, Criterion 2: Technical correction	+ 44 dwelling units
5-SWSR-8	PRMD	134-132-062 (4.41)	Change land use designation and zoning to UR 13 and R2 13 du/ac for consistency with City of Santa Rosa MR land use designation.	UR 10 / GC	R2 10 du/ac / C2	Yes, Criterion 2: Technical correction	Replace commercial use with + 13 dwelling units
5-SWSR-9	PRMD	044-101-002 (0.69) 044-101-003 (0.81) 044-101-004 (3.01) 044-101-005 (1.08) 044-101-006 (0.91) 044-101-007 (2.81)	Change land use designation and zoning to UR 13 and R2 13 du/ac for consistency with City of Santa Rosa MR land use designation.	GI	M1	Yes, Criterion 2: Technical correction	Replace industrial use with + 142 dwelling units

Request No.	Applicant (Owners)	APN (Acres) Location	Land Use Map Amendment Request	Existing Land Use Designation and Use(s)	Existing Zoning	Meets Screening Criteria?	Net Changes if Approved
5-SWSR-9 (cont.)		044-101-010 (0.60) 044-101-066 (0.45) 044-101-067 (0.30) 044-101-068 (0.34) 044-101-072 (0.40)					
5-SWSR-10	PRMD	044-101-011 (4.01) 044-101-012 (4.00) 044-101-014 (0.71) 044-101-021 (0.48) 044-101-023 (1.26) 044-101-053 (3.91)	Change land use designation and zoning to UR 13 and R2 13 du/ac for consistency with City of Santa Rosa MR land use designation.	UR 10	R2 10 du/ac	Yes, Criterion 2: Technical correction	+ 84 dwelling units

Request No.	Applicant (Owners)	APN (Acres) Location	Land Use Map Amendment Request	Existing Land Use Designation and Use(s)	Existing Zoning	Meets Screening Criteria?	Net Changes if Approved
5-SWSR-10 (cont.)		044-101-056 (3.18) 044-101-076 (4.69) 044-101-079 (5.73)					
5-SWSR-11	PRMD	044-101-018 (0.82) 044-101-038 (0.21) 044-101-041 (0.27) 044-101-046 (0.22) 044-101-047 (0.22) 044-101-048 (0.18) 044-101-049 (0.18) 044-101-062 (0.93) 044-101-071 (0.97)	Change land use designation and zoning to UR 20 and R3 20 du/ac for consistency with City of Santa Rosa MHR land use designation.	UR 10	R2 10 du/ac	Yes, Criterion 2: Technical correction	+ 11 dwelling units

Request No.	Applicant (Owners)	APN (Acres) Location	Land Use Map Amendment Request	Existing Land Use Designation and Use(s)	Existing Zoning	Meets Screening Criteria?	Net Changes if Approved
5-SWSR-12	PRMD	044-101-020 (1.00) 044-101-024 (0.18) 044-101-073 (0.41) 044-101-078 (2.69)	Change land use designation and zoning to UR 13 and R2 13 du/ac for consistency with City of Santa Rosa MR land use designation.	UR 10 / GC GC GC GC	R2 10 du/ac / C2 C2 C2 C1	Yes, Criterion 2: Technical correction	Replace commercial use with + 13 dwelling units
5-SWSR-13	PRMD	125-081-030 (1.95) 125-081-032 (1.96) 125-081-016 (0.46) 125-082-025 (2.17)	Change land use designation and zoning to UR 13 / GC and R2 13 du/ac / C2 for consistency with City of Santa Rosa MR / RBS land use designation.	GI	M1	Yes, Criterion 2: Technical correction	Replace industrial use with + 79 dwelling units
5-SWSR-14	PRMD	125-081-021 (0.81) 125-081-026 (1.19) 125-081-027 (0.57) 125-082-009 (1.43)	Change land use designation and zoning to UR 13 and R2 13 du/ac for consistency with City of Santa Rosa MR land use designation.	GI	M1	Yes, Criterion 2: Technical correction	Replace industrial use with + 88 dwelling units

Request No.	Applicant (Owners)	APN (Acres) Location	Land Use Map Amendment Request	Existing Land Use Designation and Use(s)	Existing Zoning	Meets Screening Criteria?	Net Changes if Approved
5-SWSR-14 (cont.)		125-082-014 (0.92) 125-082-015 (0.47) 125-082-022 (0.49)					
5-SWSR-15	PRMD	125-091-030 (2.29) 125-091-033 (0.95) 125-091-035 (2.40)	Change land use designation and zoning to UR 13 / GC and R2 13 du/ac / C2 for consistency with City of Santa Rosa MR / RBS land use designation.	GI	M1	Yes, Criterion 2: Technical correction	Replace industrial use with + 69 dwelling units
5-SWSR-16	PRMD	125-091-020 (0.36) 125-091-026 (4.78)	Change land use designation and zoning to UR 13 and R2 13 du/ac for consistency with City of Santa Rosa MR land use designation.	GI	M1	Yes, Criterion 2: Technical correction	Replace industrial use with + 64 dwelling units
5-SWSR-17	PRMD	125-091-037 (0.81) 125-091-036 (0.46)	Change land use designation and zoning to UR 13 / GC and R2 13 du/ac / C2 for consistency with City of Santa Rosa MR / RBS land use designation.	GC	C2	Yes, Criterion 2: Technical correction	Replace commercial use with + 13 dwelling units

Request No.	Applicant (Owners)	APN (Acres) Location	Land Use Map Amendment Request	Existing Land Use Designation and Use(s)	Existing Zoning	Meets Screening Criteria?	Net Changes if Approved
5-SWSR-18	PRMD	125-101-004 (0.17) 125-101-015 (0.47) 125-101-016 (0.14) 125-101-017 (0.14) 125-101-018 (0.60) 125-101-039 (0.29) 125-101-040 (0.29) 125-101-041 (0.94) 125-101-044 (1.01) 125-101-045 (1.06)	Change land use designation and zoning to UR 13 and R2 13 du/ac for consistency with City of Santa Rosa MR land use designation.	GI	M1 or C2	Yes, Criterion 2: Technical correction	Replace industrial use with + 51 dwelling units

Request No.	Applicant (Owners)	APN (Acres) Location	Land Use Map Amendment Request	Existing Land Use Designation and Use(s)	Existing Zoning	Meets Screening Criteria?	Net Changes if Approved
5-SWSR-19	PRMD	125-101-052 (0.52) 125-101-053 (2.46)	Change land use designation and zoning to UR 13 / GC and R2 13 du/ac / C2 for consistency with City of Santa Rosa MR / RBS land use designation.	GC	C2	Yes, Criterion 2: Technical correction	Replace commercial use with + 35 dwelling units
5-SWSR-20	PRMD	125-101-031 (0.60)	Change land use designation and zoning to UR 13 and R2 13 du/ac for consistency with City of Santa Rosa MR land use designation.	GC	C2	Yes, Criterion 2: Technical correction	Replace commercial use with + 6 dwelling units
5-SWSR-21	PRMD	125-111-045 (1.12)	Change land use designation and zoning to GC/UR 13 and C1/ R2 13 du/ac for consistency with City of Santa Rosa R/MR land use designation.	GI	M1	Yes, Criterion 2: Technical correction	Replace industrial use with + 13 dwelling units
5-SWSR-22	PRMD	125-111-037 (6.96) 125-111-046 (1.17) 125-111-047 (1.18) 125-111-048 (0.31)	Change land use designation and zoning to GC/UR 13 and C1/R2 13 du/ac for consistency with City of Santa Rosa R/MR land use designation.	GC	C2	Yes, Criterion 2: Technical correction	Replace commercial use with + 120 dwelling units

Request No.	Applicant (Owners)	APN (Acres) Location	Land Use Map Amendment Request	Existing Land Use Designation and Use(s)	Existing Zoning	Meets Screening Criteria?	Net Changes if Approved
5-SWSR-23	PRMD	125-142-034 (0.19) 125-142-058 (1.23) 125-142-069 (1.36) 125-142-065 (0.24) 125-142-066 (1.04)	Change land use designation and zoning to UR 5 and R1 5 du/ac for consistency with City of Santa Rosa LR land use designation.	GC GI GI GI GI	C2 M1 M1 M1 M1	Yes, Criterion 2: Technical correction	Replace commercial / industrial use with + 24 dwelling units
5-SWSR-24	PRMD	125-151-041 (0.34)	Change land use designation and zoning to UR 13 and R2 13 du/ac for consistency with City of Santa Rosa MR land use designation.	GC	C2	Yes, Criterion 2: Technical correction	Replace commercial use with + 3 dwelling units
5-SWSR-25	PRMD	125-161-024 (0.25) 125-161-025 (0.15) 125-161-027 (0.55) 125-161-028 (0.65) 125-161-029 (0.14)	Change land use designation and zoning to UR 13 and R2 13 du/ac for consistency with City of Santa Rosa MR land use designation.	GC	C2	Yes, Criterion 2: Technical correction	Replace commercial use with + 50 dwelling units

Request No.	Applicant (Owners)	APN (Acres) Location	Land Use Map Amendment Request	Existing Land Use Designation and Use(s)	Existing Zoning	Meets Screening Criteria?	Net Changes if Approved
5-SWSR-25 (cont.)		125-161-030 (0.26) 125-162-013 (0.88) 125-162-024 (0.77) 125-162-025 (0.44) 125-162-026 (0.32) 125-162-027 (0.55) 125-162-030 (0.17)					
5-SWSR-26	PRMD	125-161-013 (0.17)	Change land use designation and zoning to UR 20 and R3 20 du/ac for consistency with City of Santa Rosa MHR land use designation.	GC	R1 5 du/ac	Yes, Criterion 2: Technical correction	Replace commercial use with + 2 dwelling units
Sebastopol Planning Area							
6-1	Keegan	084-100-040 (4.23) Sebastopol	Change land use designation and zoning to RR 2 to increase subdivision and residential development potential.	RR 6 Residential	AR 6	No	+ 1 dwelling unit

Request No.	Applicant (Owners)	APN (Acres) Location	Land Use Map Amendment Request	Existing Land Use Designation and Use(s)	Existing Zoning	Meets Screening Criteria?	Net Changes if Approved
6-2	Wood	083-073-022 (1.04) Forestville	Change land use designation and zoning to UR 20 and R3 20 du/ac SD to allow for development of affordable senior housing.	RR 2 Vacant	RR 2 SD	Yes, Criterion 1: Housing	+ 19 dwelling units
6-3	Schroeder	130-172-009 (0.96) Graton	Change land use designation and zoning to UR 5 and R1 5 du/ac to increase residential development potential.	UR 2 Residential	RR 2 du/ac	No	+ 3 dwelling units
6-5	Dillon	083-080-052 (0.18) Forestville	Change land use designation and zoning to allow for residential use without a Use Permit. (Closest residential land use designation and zoning are UR 2 and R1 2 du/ac).	LC Vacant	LC SD SR	No	Potential commercial use with residential use
6-6	Kuziara	073-010-034 (30.49) Sebastopol	Change zoning to RR 10 to allow for subdivision into three lots.	RR 10 Residential	RR B7	No	+ 2 dwelling units

Request No.	*Applicant (Owners)*	*APN (Acres) Location*	*Land Use Map Amendment Request*	*Existing Land Use Designation and Use(s)*	*Existing Zoning*	*Meets Screening Criteria?*	*Net Changes if Approved*
Rohnert Park – Cotati Planning Area							
7 - 1	PRMD (Numerous owners)	047-281-002 to 047-304-035 (230 parcels) Rohnert Park	Change land use designation and zoning to reflect extension of water and wastewater service to portion of Canon Manor West Subdivision (Canon Manor West Assessment District).	RR 20 Residential, vacant	RR 20	Yes, Criterion 3: Consistency with con-current policy change	+ 269 dwelling units (assuming *developed* one-acre and 1.5-acre lots can be subdivided; there is adequate water supply and sewer capacity; and water and sewer services are provided

* Option 4 (Request 7-1):

1. Change the land use designation from RR 20 to UR 2.

2. Change the zoning from RR 20 to RR 1.

3. Incorporate the following policy into the Planning Area 7 policies in the Land Use Element:

   LU-XXX: The County will consider rezoning to RR 2 du/ac if all of the following criteria are met:

   1) All water, wastewater, and road improvements to be provided under the Canon Manor West Assessment District are installed and operational;

   2) There is demonstrated sewer capacity available to serve the additional lots;

   3) The Agreement between the County and the City of Rohnert Park regarding the provision of sewer service has been amended to accommodate creation of new lots;

   4) The Penngrove Water Company has adequate water supply and agreed to serve the additional lots.

4. Apply a "Z" Combining District to prohibit second dwelling units due to declining groundwater availability in the area and limits on wastewater disposal capacity.

Request No.	Applicant (Owners)	APN (Acres) Location	Land Use Map Amendment Request	Existing Land Use Designation and Use(s)	Existing Zoning	Meets Screening Criteria?	Net Changes if Approved
Petaluma Planning Area (No Requests)							
Sonoma Valley Planning Area							
9 - 1	McClintock	056-433-022 (3.0) Sonoma	Change land use designation and zoning to UR 20 and R3 20 du/ac to increase residential development potential.	UR 10 Residential - 36 units	R2 10 du/ac	No	+ 30 dwelling units
9 - 2	Dilorio (Richards)	054-330-034 (1.38) Glen Ellen	Change land use designation and zoning to RVSC and K BR F2 HD.	LC Jack London Lodge	LC BR F2 HD P	Yes, Criterion 2: Non-conforming use	Replace commercial use with expanded recreation and visitor-serving use
9 - 3	Anderson	052-451-029 (0.16) Sonoma 052-451-028 (0.56) Sonoma	Change land use designation and zoning to UR 5 and R1 5 du/ac to increase residential development potential.	UR 1 Vacant, Residential	R1 1 du/ac	No	+ 1 dwelling unit
9 - 4	Palmer	053-080-002 (148.76) Glen Ellen	Change land use designation and zoning to RRD 10 and RRD 10 SR to reinstate pre-1975 designation and increase subdivision and residential development potential.	RRD 100 Vacant	RRD 100 SR	No	+ 13 dwelling units

Request No.	Applicant (Owners)	APN (Acres) Location	Land Use Map Amendment Request	Existing Land Use Designation and Use(s)	Existing Zoning	Meets Screening Criteria?	Net Changes if Approved
9 - 6	Curotto (Holmes)	126-031-060 (4.62) Sonoma	Change land use designation and zoning to one of the following to allow for a solid waste and recycling collection facility: LC LI and M1 or M3	RR 5 Vacant	AR 5	Yes, Criterion 4: Quasi-public facility	Replace potential residential use with commercial solid waste and recycling collection facility
9-8	Hill, Perry	Town of Glen Ellen	Incorporate specific new policies into Sonoma Valley Planning Area policies of Land Use Element.	N/A	N/A	Yes, Criterion 1: Agricultural Tourism	0

Source: Sonoma County PRMD, March 2004

APPENDIX 7.6 TRANSPORTATION

7.6 TRANSPORTATION

As discussed in ***Section 4.2 Transportation***, this appendix contains the data obtained from the Sonoma County Traffic Model as part of the impact analysis for the *Draft GP 2020*. **Exhibit 7.6-1** contains the data for Sonoma County roadways for the AM Peak Hour. **Exhibit 7.6-2** contains the data for the PM Peak Hour. The methodology used to determine impacts to county roadways is discussed in ***Section 4.2 Transportation***.

Exhibit 7.6-1 Traffic Model Data for the AM Peak Hour

				North or Eastbound Counts					South or Westbound Counts					Scenario 9 - 2000 Base Year Model								Scenario 10: Projected/Preferred 2020 AM Peak							
AM County Count Locations 2001	Facility Types	Max. Speed	Speed V/C=1	N or E Counts	N or E Cap.	N or E V/C	N or E Speed	N or E LOS	S or W Counts	S or W Cap.	S or W V/C	S or W Speed	S or W LOS	N or E Base Vol	N or E Base V/C	N or E Base Speed	N or E Base LOS	S or W Base Vol	S or W Base V/C	S or W Base Speed	S or W Base LOS	N or E Alt 10 Final Vol	N or E Alt 10 V/C	N or E Alt 1 Speed	N or E Alt 10 LOS	S or W Alt 10 Final Vol	S or W Alt 10 V/C	S or W Alt 10 Speed	S or W Alt 10 LOS
Adobe Road W/ Corona Road	RSA	50	19	628	1,280	0.49	45.7	*A*	399	1,280	0.31	49.2	*A*	963	0.75	32.8	*C*	732	0.57	42.6	*A*	628	0.49	45.7	*A*	399	0.31	49.2	*A*
Adobe Road E/ E. Washington Street	Rural A	50	23	728	1,600	0.46	47.6	*A*	483	1,600	0.30	49.5	*A*	1052	0.66	41.0	*C*	1061	0.66	40.7	*C*	728	0.46	47.6	*A*	926	0.58	44.2	*B*
Adobe Road E/ Frates Road	Rural A	50	23	615	1,600	0.38	48.8	*A*	541	1,600	0.34	49.2	*A*	763	0.48	47.1	*A*	1398	0.87	29.7	*E*	784	0.49	46.8	*B*	1077	0.67	40.3	*C*
Agua Caliente Road E/ Arnold Drive	RSC	33	13	130	1,120	0.12	33.0	*A*	229	1,120	0.20	32.9	*A*	124	0.11	33.0	*A*	146	0.13	33.0	*A*	202	0.18	32.9	*A*	345	0.31	32.5	*A*
Airport Boulevard E/ Regional Parkway	ART1	40	13	584	800	0.73	25.2	*C*	573	800	0.72	25.9	*C*	107	0.13	40.0	*A*	1120	1.40	4.5	*F*	649	0.81	21.1	*D*	1356	1.70	2.2	*F*
Alexander Valley Road W/ Lytton Station Road	RSA	50	19	128	1,280	0.10	50.0	*A*	139	1,280	0.11	50.0	*A*	43	0.03	50.0	*A*	37	0.03	50.0	*A*	338	0.26	49.6	*A*	147	0.11	50.0	*A*
Arnold Drive N/ Watmaugh Road	RSA	50	19	396	1,280	0.31	49.3	*A*	761	1,280	0.59	41.5	*B*	518	0.40	47.9	*A*	1619	1.26	9.7	*F*	451	0.35	48.8	*A*	1262	0.99	19.7	*E*
Arnold Drive N/ Verano Avenue	RSB	40	16	560	1,200	0.47	37.3	*A*	785	1,200	0.65	31.4	*B*	850	0.71	29.0	*C*	1660	1.38	6.2	*F*	756	0.63	32.4	*B*	869	0.72	28.3	*C*
Arnold Drive N/ Agua Caliente Road	RSA	50	19	343	1,280	0.27	49.6	*A*	560	1,280	0.44	47.2	*A*	620	0.48	45.9	*A*	608	0.48	46.2	*A*	854	0.67	37.8	*B*	683	0.53	44.2	*A*
Arnold Drive W/ S.H. 12 (Glen Ellen)	RSA	50	19	NA	1,280				NA					390	0.30	49.3	*A*	237	0.19	49.9	*A*	403	0.31	49.2	*A*	322	0.25	49.7	*A*
Bennett Valley Road W/ Grange Road	Rural A	50	23	359	1,600	0.22	49.9	*A*	242	1,600	0.15	50.0	*A*	291	0.18	49.9	*A*	185	0.12	50.0	*A*	923	0.58	44.2	*B*	870	0.54	45.3	*B*
Bodega Avenue W/ Thompson Lane	Rural A	50	23	249	1,600	0.16	50.0	*A*	260	1,600	0.16	50.0	*A*	524	0.33	49.3	*A*	442	0.28	49.7	*A*	466	0.29	49.6	*A*	438	0.27	49.7	*A*
Bodega Highway W/ Watertrough Road	Rural B	40	18	408	1,500	0.27	39.7	*A*	320	1,500	0.21	39.9	*A*	511	0.34	39.4	*A*	411	0.27	39.7	*A*	553	0.37	39.1	*A*	522	0.35	39.3	*A*
Bohemian Highway N/ Freestone Flat Road	Rural D	27	12	69	1,300	0.05	27.0	*A*	75	1,300	0.06	27.0	*A*	215	0.17	27.0	*A*	83	0.06	27.0	*A*	109	0.08	27.0	*A*	161	0.12	27.0	*A*
Boyes Boulevard W/ Railroad Avenue	ART3	27	7	137	700	0.20	26.9	*A*	206	700	0.29	26.4	*A*	239	0.34	26.0	*A*	288	0.41	25.0	*B*	137	0.20	26.9	*A*	206	0.29	26.4	*A*
Boyes Boulevard E/ Riverside Road	ART3	27	7	281	700	0.40	25.1	*A*	300	700	0.43	24.6	*B*	455	0.65	17.9	*C*	414	0.59	20.0	*B*	281	0.40	25.1	*A*	300	0.43	24.6	*B*
Calistoga Road S/ Porter Creek Road	Rural D	27	12	144	1,300	0.11	27.0	*A*	217	1,300	0.17	27.0	*A*	259	0.20	26.9	*A*	259	0.20	26.9	*A*	144	0.11	27.0	*A*	259	0.20	26.9	*A*
Casa Grande Road S/ Adobe Road	RSA	50	19	130	1,280	0.10	50.0	*A*	164	1,280	0.13	50.0	*A*	62	0.05	50.0	*A*	275	0.21	49.8	*A*	143	0.11	50.0	*A*	164	0.13	50.0	*A*
Chileno Valley Road W/ Spring Hill Road	Rural D	27	12	64	1,300	0.05	27.0	*A*	46	1,300	0.04	27.0	*A*	28	0.02	27.0	*A*	90	0.07	27.0	*A*	88	0.07	27.0	*A*	46	0.04	27.0	*A*
Corona Road S/ Adobe Road	RSB	40	16	148	1,200	0.12	40.0	*A*	206	1,200	0.17	39.9	*A*	149	0.12	40.0	*A*	397	0.33	39.3	*A*	206	0.17	39.9	*A*	464	0.39	38.7	*A*
Crane Canyon Road E/ Petaluma Hill Road	Rural C	33	15	115	1,400	0.08	33.0	*A*	315	1,400	0.23	32.9	*A*	158	0.11	33.0	*A*	365	0.26	32.8	*A*	303	0.22	32.9	*A*	778	0.56	29.6	*B*
Crocker Road W/ River Road	Rural A	50	23	88	1,600	0.06	50.0	*A*	111	1,600	0.07	50.0	*A*	235	0.15	50.0	*A*	56	0.04	50.0	*A*	415	0.26	49.7	*A*	129	0.08	50.0	*A*
D Street S/ San Antonio Road	Rural A	50	23	117	1,600	0.07	50.0	*A*	236	1,600	0.15	50.0	*A*	91	0.06	50.0	*A*	452	0.28	49.6	*A*	130	0.08	50.0	*A*	236	0.15	50.0	*A*
Dry Creek Road N/ Lambert Bridge Road	Rural A	50	23	91	1,600	0.06	50.0	*A*	88	1,600	0.06	50.0	*A*	117	0.07	50.0	*A*	23	0.01	50.0	*A*	181	0.11	50.0	*A*	102	0.06	50.0	*A*
East Cotati Avenue W/ Petaluma Hill Road	RSC	33	13	341	1,120	0.30	32.6	*A*	220	1,120	0.20	32.9	*A*	187	0.17	33.0	*A*	350	0.31	32.5	*A*	350	0.31	32.5	*A*	333	0.30	32.6	*A*
East Washington Street S/ Adobe Road	RSA	50	19	243	1,280	0.19	49.9	*A*	301	1,280	0.24	49.8	*A*	165	0.13	50.0	*A*	203	0.16	49.9	*A*	265	0.21	49.9	*A*	455	0.36	48.7	*A*
Eastside Road N/ Trenton-Healdsburg Road	Rural B	40	18	66	1,500	0.04	40.0	*A*	124	1,500	0.08	40.0	*A*	397	0.26	39.8	*A*	354	0.24	39.8	*A*	66	0.04	40.0	*A*	237	0.16	40.0	*A*
Eighth Street East N/ S.H 12/ 121	RSB	40	16	82	1,200	0.07	40.0	*A*	41	1,200	0.03	40.0	*A*	127	0.11	40.0	*A*	242	0.20	39.9	*A*	82	0.07	40.0	*A*	113	0.09	40.0	*A*
Eighth Street East S/ East Napa Street	RSA	50	19	157	1,280	0.12	50.0	*A*	114	1,280	0.09	50.0	*A*	851	0.66	37.9	*B*	139	0.11	50.0	*A*	157	0.12	50.0	*A*	383	0.30	49.4	*A*
Fifth Street West N/ Leveroni Road	RSC	33	13	305	1,120	0.27	32.7	*A*	368	1,120	0.33	32.4	*A*	341	0.30	32.6	*A*	411	0.37	32.1	*A*	305	0.27	32.7	*A*	429	0.38	31.9	*A*
Frates Road S/ Adobe Road	RSA	50	19	223	1,280	0.17	49.9	*A*	445	1,280	0.35	48.8	*A*	121	0.09	50.0	*A*	534	0.42	47.6	*A*	365	0.29	49.5	*A*	540	0.42	47.5	*A*
Fulton Road S/ River Road	RSA	50	19	649	1,280	0.51	45.1	*A*	532	1,280	0.42	47.7	*A*	1057	0.83	28.4	*C*	667	0.52	44.6	*A*	2033	1.59	4.4	*F*	840	0.66	38.4	*B*
Fulton Road N/ River Road	RSA	50	19	583	1,280	0.46	46.7	*A*	477	1,280	0.37	48.5	*A*	1123	0.88	25.4	*D*	815	0.64	39.4	*B*	1685	1.32	8.5	*F*	754	0.59	41.8	*B*
Graton Road W/ Green Hill Road	Rural B	40	18	181	1,500	0.12	40.0	*A*	86	1,500	0.06	40.0	*A*	36	0.02	40.0	*A*	220	0.15	40.0	*A*	236	0.16	40.0	*A*	117	0.08	40.0	*A*
Guerneville Road E/ Frei Road	Rural A	50	23	698	1,600	0.44	48.0	*A*	336	1,600	0.21	49.9	*A*	796	0.50	46.6	*B*	615	0.38	48.8	*A*	1284	0.80	33.6	*D*	559	0.35	49.1	*A*
Guerneville Road E/ Vine Hill Road	Rural A	50	23	441	1,600	0.28	49.7	*A*	256	1,600	0.16	50.0	*A*	615	0.38	48.8	*A*	796	0.50	46.6	*B*	664	0.42	48.3	*A*	842	0.53	45.9	*B*
Laguna Road N/ Guerneville Road	Rural B	40	18	108	1,500	0.07	40.0	*A*	147	1,500	0.10	40.0	*A*	180	0.12	40.0	*A*	113	0.08	40.0	*A*	144	0.10	40.0	*A*	147	0.10	40.0	*A*
Lakeville Road N/ Hwy 37	Rural A	50	23	424	1,600	0.27	49.7	*A*	710	1,600	0.44	47.8	*A*	267	0.17	50.0	*A*	449	0.28	49.6	*A*	564	0.35	49.1	*A*	710	0.44	47.8	*A*
Leveroni Road E/ Arnold Drive	RSA	50	19	347	1,280	0.27	49.6	*A*	256	1,280	0.20	49.9	*A*	776	0.61	41.0	*B*	469	0.37	48.6	*A*	597	0.47	46.4	*A*	634	0.50	45.5	*A*
Llano Road N/ Ludwig Avenue	Rural A	50	23	219	1,600	0.14	50.0	*A*	256	1,600	0.16	50.0	*A*	40	0.03	50.0	*A*	197	0.12	50.0	*A*	361	0.23	49.8	*A*	256	0.16	50.0	*A*
Madrone Road W/ S.H. 12	RSB	40	16	145	1,200	0.12	40.0	*A*	250	1,200	0.21	39.9	*A*	202	0.17	40.0	*A*	298	0.25	39.8	*A*	296	0.25	39.8	*A*	250	0.21	39.9	*A*
Main Street S/ Adobe Road	ART3	27	7	306	700	0.44	24.4	*B*	617	700	0.88	9.9	*D*	484	0.69	16.3	*C*	1216	1.74	1.0	*F*	558	0.80	12.5	*D*	617	0.88	9.9	*D*
Mark West Springs Road E/ Highway 101	ART1	40	13	591	1,600	0.37	38.5	*A*	709	1,600	0.44	37.0	*A*	339	0.21	39.8	*A*	423	0.26	39.6	*A*	1108	0.69	27.1	*C*	1616	1.01	12.7	*F*
Mark West Springs Road W/ Porter Creek Road	RSA	50	19	298	1,280	0.23	49.8	*A*	244	1,280	0.19	49.9	*A*	245	0.19	49.9	*A*	251	0.20	49.9	*A*	359	0.28	49.5	*A*	295	0.23	49.8	*A*
Mecham Road S/ Dump	RSA	50	19	91	1,280	0.07	50.0	*A*	130	1,280	0.10	50.0	*A*	58	0.05	50.0	*A*	88	0.07	50.0	*A*	172	0.13	50.0	*A*	154	0.12	50.0	*A*
Millbrae Avenue E/ Stony Point Road	ART1	40	13	147	800	0.18	39.9	*A*	97	800	0.12	40.0	*A*	171	0.21	39.8	*A*	35	0.04	40.0	*A*	147	0.18	39.9	*A*	154	0.19	39.9	*A*
Mirabel Road S/ Trenton Road	RSB	40	16	238	1,200	0.20	39.9	*A*	286	1,200	0.24	39.8	*A*	283	0.24	39.8	*A*	188	0.16	40.0	*A*	238	0.20	39.9	*A*	653	0.54	35.4	*B*
Mountain View Avenue E/ Santa Rosa Avenue	RSC	33	13	122	1,120	0.11	33.0	*A*	149	1,120	0.13	33.0	*A*	53	0.05	33.0	*A*	65	0.06	33.0	*A*	379	0.34	32.3	*A*	499	0.45	31.1	*A*
Napa Road E/ Burndale Road	RSA	50	19	516	1,280	0.40	47.9	*A*	415	1,280	0.32	49.1	*A*	851	0.66	37.9	*B*	139	0.11	50.0	*A*	606	0.47	46.2	*A*	431	0.34	49.0	*A*
Occidental Road E/ Mill Station Road	RSA	50	19	309	1,280	0.24	49.7	*A*	127	1,280	0.10	50.0	*A*	277	0.22	49.8	*A*	148	0.12	50.0	*A*	444	0.35	48.8	*A*	144	0.11	50.0	*A*
Occidental Road W/ Sanford Road	RSB	40	16	492	1,200	0.41	38.4	*A*	266	1,200	0.22	39.9	*A*	432	0.36	39.0	*A*	308	0.26	39.7	*A*	785	0.65	31.4	*B*	480	0.40	38.5	*A*
Old Redwood Highway S/ Ursiline Road	RSB	40	16	380	1,200	0.32	39.4	*A*	560	1,200	0.47	37.3	*A*	981	0.82	24.0	*D*	1256	1.05	14.3	*F*	592	0.49	36.7	*B*	1376	1.15	11.1	*F*
Old Redwood Highway N/ Fulton Road	RSB	40	16	311	1,200	0.26	39.7	*A*	570	1,200	0.48	37.2	*A*	479	0.40	38.5	*A*	987	0.82	23.7	*D*	1036	0.86	21.8	*D*	1142	0.95	17.9	*E*
Old Redwood Highway N/ Eastside Road	Rural A	50	23	222	1,600	0.14	50.0	*A*	175	1,600	0.11	50.0	*A*	525	0.33	49.3	*A*	307	0.19	49.9	*A*	705	0.44	47.9	*A*	257	0.16	50.0	*A*
Old Redwood Highway North N/ Ely Road	RSB	40	16	523	1,200	0.44	37.9	*A*	1136	1,200	0.95	18.1	*E*	468	0.39	38.7	*A*	1253	1.04	14.4	*F*	677	0.56	34.7	*B*	1136	0.95	18.1	*E*
Pepper Road E/ Walker Road	Rural A	50	23	136	1,600	0.09	50.0	*A*	196	1,600	0.12	50.0	*A*	59	0.04	50.0	*A*	88	0.06	50.0	*A*	217	0.14	50.0	*A*	234	0.15	50.0	*A*
Petaluma Avenue E/ Arnold Drive	RSC	33	13	262	1,120	0.23	32.8	*A*	213	1,120	0.19	32.9	*A*	552	0.49	30.3	*B*	657	0.59	27.9	*B*	398	0.36	32.2	*A*	426	0.38	32.0	*A*
Petaluma Boulevard North N/ Skillman Lane	RSA	50	19	599	1,280	0.47	46.4	*A*	687	1,280	0.54	44.0	*A*	328	0.26	49.7	*A*	822	0.64	39.1	*B*	952	0.74	33.4	*C*	687	0.54	44.0	*A*
Petaluma Hill Road N/ Roberts	RSA	50	19	642	1,280	0.50	45.3	*A*	328	1,280	0.26	49.7	*A*	887	0.69	36.3	*B*	1704	1.33	8.2	*F*	1282	1.00	18.9	*F*	328	0.26	49.7	*A*
Petaluma Hill Road N/ Snyder Lane	RSA	50	19	626	1,280	0.49	45.7	*A*	473	1,280	0.37	48.5	*A*	546	0.43	47.4	*A*	2833	2.21	1.2	*F*	2025	1.58	4.5	*F*	473	0.37	48.5	*A*
Piner Road E/ Willowside Road	RSB	40	16	106	1,200	0.09	40.0	*A*	63	1,200	0.05	40.0	*A*	190	0.16	40.0	*A*	116	0.10	40.0	*A*	212	0.18	39.9	*A*	88	0.07	40.0	*A*
Pleasant Hill Road S/ Watertrough Road	RSB	40	16	100	1,200	0.08	40.0	*A*	116	1,200	0.10	40.0	*A*	143	0.12	40.0	*A*	112	0.09	40.0	*A*	119	0.10	40.0	*A*	150	0.13	40.0	*A*
River Road W/ Mirabel Road	Rural A	50	23	653	1,600	0.41	48.4	*A*	443	1,600	0.28	49.7	*A*	725	0.45	47.6	*A*	1103	0.69	39.5	*C*	807	0.50	46.5	*B*	1308	0.82	32.8	*D*
River Road Btw Olivet Rd. & Slusser Rd.	Rural A	50	23	NA	1,600				NA					600	0.38	48.9	*A*	776	0.49	47.0	*B*	895	0.56	44.8	*B*	1400	0.88	29.6	*E*
River Road W/ Fulton Road	Rural A	50	23	567	1,600	0.35	49.1	*A*	402	1,600	0.25	49.8	*A*	802	0.50	46.6	*B*	910	0.57	44.5	*B*	849	0.53	45.7	*B*	1199	0.75	36.5	*C*
Riverside Drive N/ S.H. 12	RSD	27	10	433	1,040	0.42	25.7	*B*	453	1,040	0.44	25.4	*B*	834	0.80	15.9	*D*	1337	1.29	4.8	*F*	659	0.63	21.2	*B*	518	0.50	24.4	*B*
Roblar Road E/ Canfield Road	Rural A	50	23	81	1,600	0.05	50.0	*A*	38	1,600	0.02	50.0	*A*	231	0.14	50.0	*A*	151	0.09	50.0	*A*	163	0.10	50.0	*A*	121	0.08	50.0	*A*
Rohnert Park Expressway E/ Stony Point Road	RSB	40	16	308	1,200	0.26	39.7	*A*	242	1,200	0.20	39.9	*A*	969	0.81	24.4	*D*	254	0.21	39.9	*A*	380	0.32	39.4	*A*	362	0.30	39.5	*A*
Rohnert Park Expressway W/ Petaluma Hill Road	RSA	50	19	295	1,280	0.23	49.8	*A*	203	1,280	0.16	49.9	*A*	349	0.27	49.6	*A*	574	0.45	46.9	*A*	506	0.40	48.1	*A*	203	0.16	49.9	*A*
Santa Rosa Avenue N/ Mountain View Avenue	RSB	40	16	553	1,200	0.46	37.5	*A*	552	1,200	0.46	37.5	*A*	120	0.10	40.0	*A*	948	0.79	25.2	*C*	1393	1.16	10.7	*F*	575	0.48	37.1	*A*
Skillman Lane E/ Thompson Lane	RSB	40	16	184	1,200	0.15	40.0	*A*	119	1,200	0.10	40.0	*A*	152	0.13	40.0	*A*	180	0.15	40.0	*A*	234	0.20	39.9	*A*	137	0.11	40.0	*A*
Skylane Boulevard N/ Airport Boulevard	RSB	40	16	199	1,200	0.17	40.0	*A*	276	1,200	0.23	39.8	*A*	156	0.13	40.0	*A*	135	0.11	40.0	*A*	390	0.33	39.3	*A*	406	0.34	39.2	*A*
Snyder Lane S/ Petaluma Hill Road	RSA	50	19	400	1,280	0.31	49.2	*A*	237	1,280	0.19	49.9	*A*	159	0.12	50.0	*A*	1048	0.82	28.8	*C*	941	0.74	33.9	*C*	237	0.19	49.9	*A*

Exhibit 7.6-1 Traffic Model Data for the AM Peak Hour

				North or Eastbound Counts					South or Westbound Counts					Scenario 9 - 2000 Base Year Model								Scenario 10: Projected/Preferred 2020 AM Peak							
AM County Count Locations 2001	**Facility Types**	**Max. Speed**	**Speed V/C=1**	**N or E Counts**	**N or E Cap.**	**N or E V/C**	**N or E Speed**	**N or E LOS**	**S or W Counts**	**S or W Cap.**	**S or W V/C**	**S or W Speed**	**S or W LOS**	**N or E Base Vol**	**N or E Base V/C**	**N or E Base Speed**	**N or E Base LOS**	**S or W Base Vol**	**S or W Base V/C**	**S or W Base Speed**	**S or W Base LOS**	**N or E Alt 10 Final Vol**	**N or E Alt 10 V/C**	**N or E Alt 1 Speed**	**N or E Alt 10 LOS**	**S or W Alt 10 Final Vol**	**S or W Alt 10 V/C**	**S or W Alt 10 Speed**	**S or W Alt 10 LOS**
Stony Point Road S/ Mecham Road	Rural A	50	23	259	1,600	0.16	50.0	***A***	715	1,600	0.45	47.8	***A***	209	0.13	50.0	***A***	911	0.57	44.5	***B***	693	0.43	48.0	***A***	715	0.45	47.8	***A***
Stony Point Road N/ Roblar Road	RSA	50	19	416	1,280	0.33	49.1	***A***	878	1,280	0.69	36.7	***B***	302	0.24	49.7	***A***	954	0.75	33.3	***C***	945	0.74	33.7	***C***	878	0.69	36.7	***B***
Stony Point Road N/ S.H. 116	RSA	50	19	413	1,280	0.32	49.1	***A***	461	1,280	0.36	48.7	***A***	901	0.70	35.7	***C***	1151	0.90	24.2	***D***	1004	0.78	30.9	***C***	630	0.49	45.6	***A***
Stony Point Road N/ Scenic Avenue	RSA	50	19	591	1,280	0.46	46.5	***A***	819	1,280	0.64	39.3	***B***	551	0.43	47.3	***A***	1911	1.49	5.5	***F***	1327	1.04	17.3	***F***	1524	1.19	11.7	***F***
Todd Road E/ Stony Point Road	RSB	40	16	312	1,200	0.26	39.7	***A***	219	1,200	0.18	39.9	***A***	317	0.26	39.7	***A***	229	0.19	39.9	***A***	509	0.42	38.1	***A***	654	0.55	35.3	***B***
Tomales Road W/ Bodega Avenue	Rural A	50	23	133	1,600	0.08	50.0	***A***	94	1,600	0.06	50.0	***A***	64	0.04	50.0	***A***	269	0.17	50.0	***A***	139	0.09	50.0	***A***	94	0.06	50.0	***A***
Trinity Road E/ S.H. 12	RSD	27	10	498	1,040	0.48	24.8	***B***	515	1,040	0.50	24.5	***B***	40	0.04	27.0	***A***	25	0.02	27.0	***A***	498	0.48	24.8	***B***	519	0.50	24.4	***B***
Valley Ford Road E/ Gericke Road	Rural A	50	23	137	1,600	0.09	50.0	***A***	138	1,600	0.09	50.0	***A***	249	0.16	50.0	***A***	559	0.35	49.1	***A***	256	0.16	50.0	***A***	380	0.24	49.8	***A***
Verano Avenue W/ S.H. 12	ART2	33	10	340	750	0.45	30.1	***A***	341	750	0.45	30.0	***A***	439	0.59	26.0	***B***	480	0.64	23.8	***C***	340	0.45	30.1	***A***	383	0.51	28.5	***B***
Warm Springs Road N/ Sonoma Mt Road	RSC	33	13	103	1,120	0.09	33.0	***A***	172	1,120	0.15	33.0	***A***	180	0.16	33.0	***A***	149	0.13	33.0	***A***	545	0.49	30.4	***B***	369	0.33	32.4	***A***
Watmaugh Road E/ Arnold Drive	RSA	50	19	124	1,280	0.10	50.0	***A***	102	1,280	0.08	50.0	***A***	87	0.07	50.0	***A***	95	0.07	50.0	***A***	140	0.11	50.0	***A***	111	0.09	50.0	***A***
Westside Road N/ Felta Road	Rural B	40	18	105	1,500	0.07	40.0	***A***	91	1,500	0.06	40.0	***A***	169	0.11	40.0	***A***	70	0.05	40.0	***A***	178	0.12	40.0	***A***	127	0.08	40.0	***A***
Caltrans (State-owned) Highways	*Note:*		NO AM PEAK COUNT DATA AVAILBLE																										
S.H. 1 W/ Bodega Hwy	ART1	40	13		800	0	40.0	***na***		800	0	40.0	***na***									1,016	1.27	6.2	***F***	448	0.56	33.2	***B***
S.H. 12 S/ Warm Springs Rd.	Rural A	55	27		1,600	0	55.0	***na***		1,600	0	55.0	***na***									1,605	1.00	26.8	***E***	901	0.56	49.8	***A***
S.H. 12 S/ Pythian Rd.	Rural A	55	27		1,600	0	55.0	***na***		1,600	0	55.0	***na***									1,581	0.99	27.7	***E***	790	0.49	51.8	***A***
S.H. 12 N/ Agua Caliente	ART1	50	25		800	0	50.0	***na***		800	0	50.0	***na***									1,017	1.27	13.8	***E***	597	0.75	38.2	***A***
S.H. 12 N/ Boyes Blvd.	ART3	35	17		700	0	35.0	***na***		700	0	35.0	***na***									1,027	1.47	5.9	***F***	1,025	1.46	6.0	***F***
S.H. 12 E/ Llano Rd.	RSA	50	19		1,280	0	50.0	***na***		1,280	0	50.0	***na***									1,779	1.39	7.1	***F***	1,452	1.13	13.5	***F***
S.H. 12 S/ Verano Rd.	ART3	30	15		700	0	30.0	***na***		700	0	30.0	***na***									880	1.26	8.6	***F***	639	0.91	17.7	***C***
S.H. 37 W/ Lakeville Hwy.	FWY	60	30		3,330	0	60.0	***na***		3,330	0	60.0	***na***									2,272	0.68	49.3	***C***	2,184	0.66	50.6	***B***
S.H. 37 Btw Lakeville & S.H. 121	FWY	60	30		3,330	0	60.0	***na***		3,330	0	60.0	***na***									2,458	0.74	46.3	***D***	2,575	0.77	44.2	***D***
S.H. 37 E/ Hwy 121	FWY	60	30		3,330	0	60.0	***na***		1,600	0	60.0	***na***									1,596	0.48	57.0	***B***	1,696	0.51	56.2	***B***
S.H. 116 E/ Adobe Rd.	Rural B	40	18		1,500	0	40.0	***na***		1,500	0	40.0	***na***									953	0.64	33.4	***C***	2,346	1.56	4.8	***F***
S.H. 116 Guerneville Br over Russian River	Rural A	50	23		1,600	0	50.0	***na***		1,600	0	50.0	***na***									372	0.23	49.8	***A***	1,211	0.76	36.1	***C***
S.H. 116 N/ Guerneville Rd.	Rural A	50	23		1,600	0	50.0	***na***		1,600	0	50.0	***na***									427	0.27	49.7	***A***	1,071	0.67	40.5	***C***
S.H. 116 S/ Occidental Rd.	Rural A	50	23		1,600	0	50.0	***na***		1,600	0	50.0	***na***									506	0.32	49.4	***A***	1,097	0.69	39.7	***C***
S.H. 116 S/ Adobe Rd.	Rural B	40	18		1,500	0	40.0	***na***		1,500	0	40.0	***na***									21	0.01	40.0	***A***	411	0.27	39.7	***A***
S.H. 116 W/ Stony Point Rd.	Rural A	50	23		1,600	0	50.0	***na***		1,600	0	50.0	***na***									1,585	0.99	23.5	***E***	986	0.62	42.8	***C***
S.H. 116 N/ Hwy 121	Rural A	50	23		1,600	0	50.0	***na***		1,600	0	50.0	***na***									508	0.32	49.4	***A***	832	0.52	46.0	***B***
S.H. 121 E/ Napa Rd.	Rural A	50	23		3,200	0	50.0	***na***		3,200	0	50.0	***na***									2,218	0.69	39.3	***C***	713	0.22	49.9	***A***
S.H. 121 S/ Junction Hwy. 116	Rural A	50	23		1,600	0	50.0	***na***		1,600	0	50.0	***na***									1,103	0.69	39.5	***C***	1,120	0.70	39.0	***C***
S.H. 121 N/ Hwy 37	Rural A	50	23		1,600	0	50.0	***na***		1,600	0	50.0	***na***									1,103	0.69	39.5	***C***	1,120	0.70	39.0	***C***
S.H. 128 W/ Chalk Hill Rd.	ART1	40	13		800	0	40.0	***na***		800	0	40.0	***na***									213	0.27	39.6	***A***	265	0.33	39.0	***A***
S.H. 128 @ Napa County Line	ART1	40	13		800	0	40.0	***na***		800	0	40.0	***na***									85	0.11	40.0	***A***	81	0.10	40.0	***A***

Note: At some locations on 101, "spillbacks" from bottle neck points may result in worse LOS conditions than indicated.

Exhibit 7.6-2 Traffic Model Data for the PM Peak Hour

PM Pk Count

Locations (Highlighting means capacity added in Preferred Alts. 2/10)	District/ Corridor	Ratio wknd/ wkdy	Facility Type	Max. Speed	Speed V/C=1	N or E Vol.	N or E Cap.	N or E V/C	N or E Speed	N or E LOS	S or W Vol.	S or W Cap.	S or W V/C	S or W Speed	S or W LOS
Adobe Road W/ Corona Road	Petaluma Urban	0.90	RSA	50	19	523	1,280	0.41	47.8	A	901	1,280	0.70	35.7	C
Adobe Road E/ E. Washington Street	Petaluma Urban	0.90	Rural A	50	23	469	1,600	0.29	49.6	A	784	1,600	0.49	46.8	B
Adobe Road E/ Frates Road	Petaluma Urban	0.90	Rural A	50	23	675	1,600	0.42	48.2	A	671	1,600	0.42	48.2	A
Agua Caliente Road E/ Arnold Drive	Sonoma Valley	1.10	RSC	33	13	176	1,120	0.16	33.0	A	186	1,120	0.17	33.0	A
Airport Boulevard E/ Regional Parkway	Airport Industrial	0.35	ART1	40	13	913	800	1.14	8.8	F	574	800	0.72	25.8	C
Alexander Valley Road W/ Lytton Station Road	Alexander Valley	1.30	RSA	50	19	265	1,280	0.21	49.9	A	153	1,280	0.12	50.0	A
Arnold Drive N/ Watmaugh Road	Sonoma Valley	0.83	RSA	50	19	845	1,280	0.66	38.2	B	552	1,280	0.43	47.3	A
Arnold Drive N/ Verano Avenue	Sonoma Valley	0.83	RSB	40	16	915	1,200	0.76	26.5	C	719	1,200	0.60	33.5	B
Arnold Drive N/ Agua Caliente Road	Sonoma Valley	0.83	RSA	50	19	573	1,280	0.45	46.9	A	581	1,280	0.45	46.8	A
Arnold Drive W/ S.H. 12 (Glen Ellen)	Sonoma Valley	1.10	RSA	50	19	232	1,280	0.18	49.9	A	296	1,280	0.23	49.8	A
Bennett Valley Road W/ Grange Road	Sonoma Mountain	1.30	Rural A	50	23	648	1,600	0.41	48.5	A	353	1,600	0.22	49.9	A
Bodega Avenue W/ Thompson Lane	Valley Ford/ Two Rock Areas	1.40	Rural A	50	23	299	1,600	0.19	49.9	A	374	1,600	0.23	49.8	A
Bodega Highway W/ Watertrough Road	Graton Rd./Bodega Hwy./Valley Ford-Freeston	1.13	Rural B	40	18	440	1,500	0.29	39.6	A	458	1,500	0.31	39.6	A
Bohemian Highway N/ Freestone Flat Road	Graton Rd./Bodega Hwy./Valley Ford-Freeston	1.13	Rural D	27	12	113	1,300	0.09	27.0	A	80	1,300	0.06	27.0	A
Boyes Boulevard W/ Railroad Avenue	Sonoma Valley	0.90	ART3	27	7	286	700	0.41	25.0	A	165	700	0.24	26.8	A
Boyes Boulevard E/ Riverside Road	Sonoma Valley	0.90	ART3	27	7	437	700	0.62	18.8	C	274	700	0.39	25.3	A
Calistoga Road S/ Porter Creek Road	Santa Rosa Northeast Rural	0.80	Rural D	27	12	259	1,300	0.20	26.9	A	236	1,300	0.18	27.0	A
Casa Grande Road S/ Adobe Road	Petaluma Urban	0.90	RSA	50	19	105	1,280	0.08	50.0	A	102	1,280	0.08	50.0	A
Chileno Valley Road W/ Spring Hill Road	South Sonoma/ Hwy. 121 Area	1.30	Rural D	27	12	90	1,300	0.07	27.0	A	75	1,300	0.06	27.0	A
Corona Road S/ Adobe Road	Petaluma Urban	0.90	RSB	40	16	364	1,200	0.30	39.5	A	234	1,200	0.20	39.9	A
Crane Canyon Road E/ Petaluma Hill Road	Rohnert Park/ Cotati Urban	1.00	Rural C	33	15	533	1,400	0.38	32.2	A	287	1,400	0.21	32.9	A
Crocker Road W/ River Road	Cloverdale	1.20	Rural A	50	23	145	1,600	0.09	50.0	A	152	1,600	0.10	50.0	A
D Street S/ San Antonio Road	South Petaluma	1.10	Rural A	50	23	410	1,600	0.26	49.7	A	147	1,600	0.09	50.0	A
Dry Creek Road N/ Lambert Bridge Road	Dry Creek Area	2.00	Rural A	50	23	129	1,600	0.08	50.0	A	161	1,600	0.10	50.0	A
East Cotati Avenue W/ Petaluma Hill Road	Rohnert Park/ Cotati Urban	0.90	RSC	33	13	404	1,120	0.36	32.2	A	424	1,120	0.38	32.0	A
East Washington Street S/ Adobe Road	Petaluma Urban	0.90	RSA	50	19	267	1,280	0.21	49.8	A	297	1,280	0.23	49.8	A
Eastside Road N/ Trenton-Healdsburg Road	Russian River/ River Road	1.20	Rural B	40	18	117	1,500	0.08	40.0	A	104	1,500	0.07	40.0	A
Eighth Street East N/ S.H 12/ 121	Sonoma Valley	1.10	RSB	40	16	88	1,200	0.07	40.0	A	87	1,200	0.07	40.0	A
Eighth Street East S/ East Napa Street	Sonoma Valley	1.10	RSA	50	19	227	1,280	0.18	49.9	A	134	1,280	0.10	50.0	A
Fifth Street West N/ Leveroni Road	Sonoma Urban	0.90	RSC	33	13	457	1,120	0.41	31.7	A	424	1,120	0.38	32.0	A
Frates Road S/ Adobe Road	Petaluma Urban	0.90	RSA	50	19	540	1,280	0.42	47.5	A	293	1,280	0.23	49.8	A
Fulton Road S/ River Road	Airport/ S. Windsor Area	0.80	RSA	50	19	883	1,280	0.69	36.5	B	971	1,280	0.76	32.5	C
Fulton Road N/ River Road	Airport/ S. Windsor Area	0.80	RSA	50	19	769	1,280	0.60	41.2	B	808	1,280	0.63	39.7	B
Graton Road W/ Green Hill Road	Graton Rd./Bodega Hwy./Valley Ford-Freeston	1.13	Rural B	40	18	127	1,500	0.08	40.0	A	212	1,500	0.14	40.0	A
Guerneville Road E/ Frei Road	Guerneville Road Corridor/ West Santa Rosa	0.80	Rural A	50	23	425	1,600	0.27	49.7	A	704	1,600	0.44	47.9	A
Guerneville Road E/ Vine Hill Road	Guerneville Road Corridor/ West Santa Rosa	0.80	Rural A	50	23	356	1,600	0.22	49.9	A	565	1,600	0.35	49.1	A
Laguna Road N/ Guerneville Road	Guerneville Road Corridor/ West Santa Rosa	0.90	Rural B	40	18	145	1,500	0.10	40.0	A	130	1,500	0.09	40.0	A
Lakeville Road N/ Hwy 37	Lakeville	0.60	Rural A	50	23	1,357	1,600	0.85	31.1	D	564	1,600	0.35	49.1	A
Leveroni Road E/ Arnold Drive	Sonoma Valley	1.10	RSA	50	19	361	1,280	0.28	49.5	A	451	1,280	0.35	48.8	A
Llano Road N/ Ludwig Avenue	Santa Rosa Urban	0.90	Rural A	50	23	472	1,600	0.30	49.6	A	271	1,600	0.17	50.0	A
Madrone Road W/ S.H. 12	Sonoma Valley	0.90	RSB	40	16	267	1,200	0.22	39.9	A	200	1,200	0.17	40.0	A
Main Street S/ Adobe Road (Penngrove)	Petaluma Urban	0.90	ART3	27	7	719	700	1.03	6.5	F	350	700	0.50	22.9	B
Mark West Springs Road E/ Highway 101	Santa Rosa Northeast Rural	0.80	ART1	40	13	822	1,600	0.51	34.9	B	808	1,600	0.51	35.2	A
Mark West Springs Road W/ Porter Creek Road	Santa Rosa Northeast Rural	0.80	RSA	50	19	339	1,280	0.26	49.6	A	388	1,280	0.30	49.3	A
Mecham Road S/ Dump	Petaluma Rural	1.10	RSA	50	19	178	1,280	0.14	50.0	A	84	1,280	0.07	50.0	A
Millbrae Avenue E/ Stony Point Road	Rohnert Park/ Cotati Urban	1.00	ART1	40	13	210	800	0.26	39.6	A	309	800	0.39	38.2	A
Mirabel Road S/ Trenton Road	Russian River/ River Road	1.20	RSB	40	16	388	1,200	0.32	39.4	A	308	1,200	0.26	39.7	A
Mountain View Avenue E/ Santa Rosa Avenue	Rohnert Park/ Cotati Urban	1.00	RSC	33	13	177	1,120	0.16	33.0	A	273	1,120	0.24	32.8	A
Napa Road E/ Burndale Road	Schellville Area	0.90	RSA	50	19	639	1,280	0.50	45.4	A	686	1,280	0.54	44.1	A
Occidental Road E/ Mill Station Road	Sebastopol	0.90	RSA	50	19	212	1,280	0.17	49.9	A	369	1,280	0.29	49.4	A
Occidental Road W/ Sanford Road	Sebastopol	0.90	RSB	40	16	458	1,200	0.38	38.8	A	852	1,200	0.71	29.0	C
Old Redwood Highway S/ Ursuline Road	Santa Rosa Northeast Rural	0.90	RSB	40	16	1,089	1,200	0.91	19.8	E	530	1,200	0.44	37.8	A
Old Redwood Highway N/ Fulton Road	Airport/ S. Windsor Area	0.90	RSB	40	16	627	1,200	0.52	36.0	B	466	1,200	0.39	38.7	A
Old Redwood Highway N/ Eastside Road	Healdsburg	1.10	Rural A	50	23	302	1,600	0.19	49.9	A	320	1,600	0.20	49.9	A
Old Redwood Highway North N/ Ely Road	Petaluma Urban	0.90	RSB	40	16	1,396	1,200	1.16	10.7	F	596	1,200	0.50	36.7	B
Pepper Road E/ Walker Road	South Coastal	1.10	Rural A	50	23	225	1,600	0.14	50.0	A	121	1,600	0.08	50.0	A
Petaluma Avenue E/ Arnold Drive	Sonoma Valley	0.90	RSC	33	13	272	1,120	0.24	32.8	A	234	1,120	0.21	32.9	A
Petaluma Boulevard North N/ Skillman Lane	Petaluma Urban	0.90	RSA	50	19	993	1,280	0.78	31.4	C	882	1,280	0.69	36.6	B
Petaluma Hill Road N/ Roberts	Rohnert Park/ Cotati Urban	0.90	RSA	50	19	1,148	1,280	0.90	24.3	D	648	1,280	0.51	45.2	A
Petaluma Hill Road N/ Snyder Lane	Rohnert Park/ Cotati Urban	0.90	RSA	50	19	1,077	1,280	0.84	27.5	D	882	1,280	0.69	36.6	B
Piner Road E/ Willowside Road	Guerneville Road Corridor/ West Santa Rosa	0.90	RSB	40	16	106	1,200	0.09	40.0	A	193	1,200	0.16	40.0	A
Pleasant Hill Road S/ Watertrough Road	Graton Rd./Bodega Hwy./Valley Ford-Freeston	1.13	RSB	40	16	131	1,200	0.11	40.0	A	110	1,200	0.09	40.0	A
River Road W/ Mirabel Road	Russian River/ River Road	1.05	Rural A	50	23	557	1,600	0.35	49.2	A	807	1,600	0.50	46.5	B
River Road Btw Olivet Rd. & Slusser Rd.	Russian River/ River Road	1.05	Rural A	50	23	280	1,600	0.18	49.9	A	492	1,600	0.31	49.5	A
River Road W/ Fulton Road	Russian River/ River Road	1.05	Rural A	50	23	535	1,600	0.33	49.3	A	622	1,600	0.39	48.7	A
Riverside Drive N/ S.H. 12	Sonoma Urban	0.80	RSD	27	10	562	1,040	0.54	23.6	B	499	1,040	0.48	24.8	B
Roblar Road E/ Canfield Road	Valley Ford/ Two Rock Areas	1.60	Rural A	50	23	59	1,600	0.04	50.0	A	87	1,600	0.05	50.0	A
Rohnert Park Expressway E/ Stony Point Road	Rohnert Park/ Cotati Urban	0.90	RSB	40	16	592	1,200	0.49	36.7	B	978	1,200	0.82	24.1	D
Rohnert Park Expressway W/ Petaluma Hill Road	Rohnert Park/ Cotati Urban	0.90	RSA	50	19	386	1,280	0.30	49.3	A	343	1,280	0.27	49.6	A
Santa Rosa Avenue N/ Mountain View Avenue	Rohnert Park/ Cotati Urban	0.90	RSB	40	16	1,250	1,200	1.04	14.5	F	666	1,200	0.56	35.0	B
Skillman Lane E/ Thompson Lane	Petaluma Urban	0.90	RSB	40	16	155	1,200	0.13	40.0	A	182	1,200	0.15	40.0	A
Skylane Boulevard N/ Airport Boulevard	Airport Industrial	0.50	RSB	40	16	285	1,200	0.24	39.8	A	227	1,200	0.19	39.9	A
Snyder Lane S/ Petaluma Hill Road	Rohnert Park/ Cotati Urban	0.90	RSA	50	19	517	1,280	0.40	47.9	A	528	1,280	0.41	47.7	A
Stony Point Road S/ Mecham Road	Rohnert Park/ Cotati Urban	0.90	Rural A	50	23	853	1,600	0.53	45.7	B	328	1,600	0.21	49.9	A
Stony Point Road N/ Roblar Road	Rohnert Park/ Cotati Urban	0.90	RSA	50	19	928	1,280	0.73	34.5	C	540	1,280	0.42	47.5	A
Stony Point Road N/ S.H. 116	Rohnert Park/ Cotati Urban	0.90	RSA	50	19	661	1,280	0.52	44.8	A	539	1,280	0.42	47.6	A
Stony Point Road N/ Scenic Avenue	Rohnert Park/ Cotati Urban	0.90	RSA	50	19	1,094	1,280	0.85	26.7	D	692	1,280	0.54	43.9	A
Todd Road E/ Stony Point Road	Rohnert Park/ Cotati Urban	0.90	RSB	40	16	339	1,200	0.28	39.6	A	332	1,200	0.28	39.7	A
Tomales Road W/ Bodega Avenue	South Coastal	1.60	Rural A	50	23	251	1,600	0.16	50.0	A	133	1,600	0.08	50.0	A
Trinity Road E/ S.H. 12	Sonoma Valley	1.10	RSD	27	10	36	1,040	0.03	27.0	A	58	1,040	0.06	27.0	A
Valley Ford Road E/ Gericke Road	Valley Ford/ Two Rock Areas	1.60	Rural A	50	23	198	1,600	0.12	50.0	A	176	1,600	0.11	50.0	A
Verano Avenue W/ S.H. 12	Sonoma Urban	0.90	ART2	33	10	434	750	0.58	26.2	B	540	750	0.72	20.4	C
Warm Springs Road N/ Sonoma Mt Road	Sonoma Valley	1.10	RSC	33	13	219	1,120	0.20	32.9	A	181	1,120	0.16	33.0	A
Watmaugh Road E/ Arnold Drive	Sonoma Valley	1.10	RSA	50	19	127	1,280	0.10	50.0	A	175	1,280	0.14	50.0	A
Westside Road N/ Felta Road	Healdsburg	1.40	Rural B	40	18	144	1,500	0.10	40.0	A	117	1,500	0.08	40.0	A

Locations	Alt 2 North or Eastbound: Raw N or E Vol	N or E Additive	N or E Vol.	N or E V/C	N or E Speed	N or E LOS	Alt 2 South or Westbound: S or W Vol	S or W Additive	S or W Vol.	S or W V/C	S or W Speed	S or W LOS
Adobe Road W/ Corona Road	440	0	523	0.41	47.8	A	1,965	1,163	1,177	0.92	23.1	D
Adobe Road E/ E. Washington Street	1,041	354	823	0.51	46.2	B	1,597	706	1,050	0.66	41.1	C
Adobe Road E/ Frates Road	1,812	803	1,478	0.92	27.0	E	789	39	710	0.44	47.8	A
Agua Caliente Road E/ Arnold Drive	280	128	304	0.27	32.7	A	191	72	258	0.23	32.9	A
Airport Boulevard E/ Regional Parkway	1,391	415	1,328	0.83	20.1	D	628	365	939	0.59	32.1	B
Alexander Valley Road W/ Lytton Station Road	49	32	297	0.23	49.8	A	95	55	208	0.16	49.9	A
Arnold Drive N/ Watmaugh Road	1,984	999	1,140	0.89	24.7	D	753	115	667	0.52	44.6	A
Arnold Drive N/ Verano Avenue	1,979	607	1,376	1.15	11.1	F	1,427	332	1,177	0.98	16.7	E
Arnold Drive N/ Agua Caliente Road	1,258	479	686	0.54	44.1	A	1,172	439	1,020	0.80	30.2	C
Arnold Drive W/ S.H. 12 (Glen Ellen)	124	0	232	0.18	49.9	A	218	0	368	0.29	49.4	A
Bennett Valley Road W/ Grange Road	755	495	1,143	0.71	38.3	C	899	663	822	0.51	46.2	B
Bodega Avenue W/ Thompson Lane	361	64	363	0.23	49.8	A	901	419	554	0.35	49.2	A
Bodega Highway W/ Watertrough Road	344	93	524	0.35	39.3	A	517	46	467	0.31	39.5	A
Bohemian Highway N/ Freestone Flat Road	150	64	176	0.14	27.0	A	109	43	136	0.10	27.0	A
Boyes Boulevard W/ Railroad Avenue	241	54	286	0.41	25.0	A	161	0	173	0.25	26.7	A
Boyes Boulevard E/ Riverside Road	313	0	377	0.54	21.8	B	258	0	323	0.46	23.9	B
Calistoga Road S/ Porter Creek Road	271	44	306	0.24	26.9	A	251	6	242	0.19	27.0	A
Casa Grande Road S/ Adobe Road	608	385	490	0.38	48.3	A	91	4	106	0.08	50.0	A
Chileno Valley Road W/ Spring Hill Road	78	0	90	0.07	27.0	A	68	32	76	0.06	27.0	A
Corona Road S/ Adobe Road	754	499	651	0.54	35.4	B	214	28	262	0.22	39.9	A
Crane Canyon Road E/ Petaluma Hill Road	909	512	843	0.60	28.5	B	544	228	515	0.37	32.3	A
Crocker Road W/ River Road	129	69	211	0.13	50.0	A	170	79	226	0.14	50.0	A
D Street S/ San Antonio Road	248	0	410	0.26	49.7	A	198	24	171	0.11	50.0	A
Dry Creek Road N/ Lambert Bridge Road	133	107	236	0.15	50.0	A	163	143	304	0.19	49.9	A
East Cotati Avenue W/ Petaluma Hill Road	157	0	404	0.36	32.2	A	425	153	577	0.52	29.8	B
East Washington Street S/ Adobe Road	659	423	690	0.54	43.9	A	132	0	297	0.23	49.8	A
Eastside Road N/ Trenton-Healdsburg Road	299	154	271	0.18	39.9	A	299	37	191	0.13	40.0	A
Eighth Street East N/ S.H 12/ 121	222	67	138	0.12	40.0	A	140	0	87	0.07	40.0	A
Eighth Street East S/ East Napa Street	276	76	273	0.21	49.8	A	211	43	167	0.13	50.0	A
Fifth Street West N/ Leveroni Road	429	76	510	0.46	31.0	B	301	0	424	0.38	32.0	A
Frates Road S/ Adobe Road	1,249	766	676	0.53	44.4	A	188	31	300	0.23	49.8	A
Fulton Road S/ River Road	1,225	644	1,364	0.53	44.2	A	1,504	720	1,691	0.66	38.2	B
Fulton Road N/ River Road	957	355	1,137	0.44	47.0	A	1,244	310	1,499	0.59	42.0	B
Graton Road W/ Green Hill Road	179	32	159	0.11	40.0	A	57	25	237	0.16	40.0	A
Guerneville Road E/ Frei Road	331	105	573	0.36	49.1	A	888	328	1,032	0.65	41.6	C
Guerneville Road E/ Vine Hill Road	888	328	684	0.43	48.1	A	331	105	713	0.45	47.8	A
Laguna Road N/ Guerneville Road	167	51	207	0.14	40.0	A	151	37	214	0.14	40.0	A
Lakeville Road N/ Hwy 37	712	282	1,468	0.46	47.5	A	547	166	730	0.23	49.8	A
Leveroni Road E/ Arnold Drive	1,041	421	782	0.61	40.7	B	858	238	689	0.54	44.0	A
Llano Road N/ Ludwig Avenue	183	18	490	0.31	49.5	A	166	111	382	0.24	49.8	A
Madrone Road W/ S.H. 12	335	178	271	0.23	39.8	A	276	125	215	0.18	39.9	A
Main Street S/ Adobe Road (Penngrove)	2,136	1,142	732	1.05	6.1	F	668	76	605	0.86	10.4	D
Mark West Springs Road E/ Highway 101	1,145	785	1,607	1.00	12.8	F	963	633	1,441	0.90	16.9	E
Mark West Springs Road W/ Porter Creek Road	**293**	62	401	0.31	49.2	A	**280**	51	410	0.32	49.2	A
Mecham Road S/ Dump	**127**	45	208	0.16	49.9	A	**73**	26	109	0.09	50.0	A
Millbrae Avenue E/ Stony Point Road	95	29	239	0.30	39.3	A	102	1	339	0.42	37.5	A
Mirabel Road S/ Trenton Road	105	24	431	0.36	39.0	A	172	62	417	0.35	39.1	A
Mountain View Avenue E/ Santa Rosa Avenue	411	353	530	0.47	30.6	B	378	323	596	0.53	29.4	B
Napa Road E/ Burndale Road	681	64	695	0.54	43.8	A	612	68	754	0.59	41.8	B
Occidental Road E/ Mill Station Road	85	34	237	0.19	49.9	A	259	93	462	0.36	48.7	A
Occidental Road W/ Sanford Road	345	152	531	0.44	37.8	A	647	238	937	0.78	25.7	C
Old Redwood Highway S/ Ursuline Road	1,003	369	1,780	0.74	27.5	C	1,605	579	1,109	0.46	37.4	A
Old Redwood Highway N/ Fulton Road	1,297	697	1,324	1.10	12.4	F	870	374	840	0.70	29.4	C
Old Redwood Highway N/ Eastside Road	406	198	510	0.32	49.4	A	606	236	556	0.35	49.2	A
Old Redwood Highway North N/ Ely Road	3,284	2,464	2,061	0.86	22.0	D	578	56	652	0.27	39.7	A
Pepper Road E/ Walker Road	119	37	256	0.16	50.0	A	84	37	151	0.09	50.0	A
Petaluma Avenue E/ Arnold Drive	922	392	489	0.44	31.3	A	814	88	322	0.29	32.7	A
Petaluma Boulevard North N/ Skillman Lane	2,119	1,284	1,209	0.94	21.8	E	361	0	882	0.69	36.6	B
Petaluma Hill Road N/ Roberts	3,447	1,966	1,391	1.09	15.3	F	845	150	798	0.62	40.1	B
Petaluma Hill Road N/ Snyder Lane	2,742	1,202	1,458	1.14	13.3	F	1,911	1,061	1,943	1.52	5.2	F
Piner Road E/ Willowside Road	101	17	122	0.10	40.0	A	163	71	264	0.22	39.9	A
Pleasant Hill Road S/ Watertrough Road	123	70	159	0.13	40.0	A	138	40	150	0.13	40.0	A
River Road W/ Mirabel Road	549	205	718	0.45	47.7	A	726	202	967	0.60	43.2	B
River Road Btw Olivet Rd. & Slusser Rd.	477	197	405	0.25	49.8	A	769	277	735	0.46	47.5	A
River Road W/ Fulton Road	872	366	901	0.56	44.7	B	1,113	382	1,004	0.63	42.3	C
Riverside Drive N/ S.H. 12	1,060	145	656	0.63	21.3	B	1,235	293	792	0.76	17.2	C
Roblar Road E/ Canfield Road	104	62	95	0.06	50.0	A	189	28	117	0.07	50.0	A
Rohnert Park Expressway E/ Stony Point Road	613	269	861	0.72	28.6	C	752	291	1,269	1.06	13.9	F
Rohnert Park Expressway W/ Petaluma Hill Road	472	63	449	0.35	48.8	A	847	401	663	0.52	44.7	A
Santa Rosa Avenue N/ Mountain View Avenue	1,055	553	1,402	1.17	10.5	F	820	528	1,194	1.00	16.2	E
Skillman Lane E/ Thompson Lane	153	33	188	0.16	40.0	A	200	48	230	0.19	39.9	A
Skylane Boulevard N/ Airport Boulevard	516	293	720	0.60	33.5	B	229	20	304	0.25	39.8	A
Snyder Lane S/ Petaluma Hill Road	578	128	645	0.50	45.2	A	693	322	850	0.66	38.0	B
Stony Point Road S/ Mecham Road	2,065	1,309	1,000	0.63	42.4	C	408	66	375	0.23	49.8	A
Stony Point Road N/ Roblar Road	2,106	1,297	1,100	0.86	26.5	D	520	39	600	0.47	46.3	A
Stony Point Road N/ S.H. 116	2,274	1,598	1,000	0.78	31.1	C	1,194	647	1,000	0.78	31.1	C
Stony Point Road N/ Scenic Avenue	2,629	1,582	1,100	0.43	47.4	A	1,556	728	1,420	0.55	43.3	A
Todd Road E/ Stony Point Road	636	513	559	0.47	37.4	A	597	241	573	0.48	37.1	A
Tomales Road W/ Bodega Avenue	171	0	251	0.16	50.0	A	114	15	148	0.09	50.0	A
Trinity Road E/ S.H. 12	29	0	36	0.03	27.0	A	32	0	58	0.06	27.0	A
Valley Ford Road E/ Gericke Road	301	91	289	0.18	49.9	A	492	217	314	0.20	49.9	A
Verano Avenue W/ S.H. 12	562	88	522	0.70	21.4	C	481	27	567	0.76	18.8	C
Warm Springs Road N/ Sonoma Mt Road	372	254	476	0.43	31.4	A	483	396	577	0.52	29.8	B
Watmaugh Road E/ Arnold Drive	101	0	127	0.10	50.0	A	85	4	192	0.15	50.0	A
Westside Road N/ Felta Road	152	62	206	0.14	40.0	A	128	37	154	0.10	40.0	A

Buildout Alternative — Project Alternative

Locations	Alt 3: N or E Vol	N or E Additive	N or E Vol.	N or E V/C	N or E Speed	N or E LOS	Alt 3: S or W Vol	S or W Additive	S or W Vol.	S or W V/C	S or W Speed	S or W LOS	N or E Vol	N or E Additive	Alt 4: N or E Vol.	N or E V/C	N or E Speed	N or E LOS	S or W Vol
Adobe Road W/ Corona Road	1,155	666	1,189	0.93	22.6	E	1,739	937	1,838	1.44	6.3	F	657	168	691	0.54	43.9	A	1,088
Adobe Road E/ E. Washington Street	1,501	814	1,283	0.80	33.7	D	1,717	826	1,610	1.01	22.7	F	1,018	331	800	0.50	46.6	B	1,187
Adobe Road E/ Frates Road	1,843	834	1,509	0.94	25.9	E	1,597	847	1,518	0.95	25.6	E	1,400	391	1,066	0.67	40.6	C	986
Agua Caliente Road E/ Arnold Drive	265	113	289	0.26	32.8	A	262	143	329	0.29	32.6	A	206	54	230	0.21	32.9	A	155
Airport Boulevard E/ Regional Parkway	3,730	2,754	3,667	4.58	0.0	F	1,732	1,469	2,043	2.55	0.4	F	1,532	556	1,469	1.84	1.6	F	641
Alexander Valley Road W/ Lytton Station Road	91	74	339	0.26	49.6	A	444	404	557	0.44	47.2	A	47	30	295	0.23	49.8	A	91
Arnold Drive N/ Watmaugh Road	1,977	992	1,837	1.44	6.3	F	1,346	708	1,260	0.98	19.7	E	1,280	295	1,140	0.89	24.7	D	784
Arnold Drive N/ Verano Avenue	1,947	575	1,490	1.24	8.8	F	1,656	561	1,280	1.07	13.6	F	1,376	4	1,376	1.15	11.1	F	1,188
Arnold Drive N/ Agua Caliente Road	1,072	293	866	0.68	37.3	B	1,171	438	1,019	0.80	30.2	C	892	113	686	0.54	44.1	A	931
Arnold Drive W/ S.H. 12 (Glen Ellen)	488	256	488	0.38	48.3	A	661	365	661	0.52	44.8	A	295	63	295	0.23	49.8	A	368
Bennett Valley Road W/ Grange Road	886	626	1,274	0.80	34.0	D	911	675	1,028	0.64	41.7	C	774	514	1,162	0.73	37.7	C	705
Bodega Avenue W/ Thompson Lane	628	331	630	0.39	48.6	A	930	448	822	0.51	46.2	B	408	111	410	0.26	49.7	A	662
Bodega Highway W/ Watertrough Road	385	134	574	0.38	39.0	A	577	106	564	0.38	39.0	A	335	84	524	0.35	39.3	A	480
Bohemian Highway N/ Freestone Flat Road	216	130	243	0.19	27.0	A	175	109	189	0.15	27.0	A	149	63	176	0.14	27.0	A	122
Boyes Boulevard W/ Railroad Avenue	219	32	318	0.45	24.1	B	237	48	213	0.30	26.4	A	172	0	286	0.41	25.0	A	197
Boyes Boulevard E/ Riverside Road	398	24	461	0.66	17.6	C	574	159	433	0.62	19.0	B	267	0	377	0.54	21.8	B	323
Calistoga Road S/ Porter Creek Road	479	252	511	0.39	26.2	A	341	96	332	0.26	26.9	A	274	47	306	0.24	26.9	A	254
Casa Grande Road S/ Adobe Road	235	12	282	0.22	49.8	A	84	0	105	0.08	50.0	A	271	48	153	0.12	50.0	A	111
Chileno Valley Road W/ Spring Hill Road	108	27	117	0.09	27.0	A	68	32	107	0.08	27.0	A	80	0	90	0.07	27.0	A	37
Corona Road S/ Adobe Road	546	291	655	0.55	35.3	B	301	115	349	0.29	39.6	A	542	287	651	0.54	35.4	B	308
Crane Canyon Road E/ Petaluma Hill Road	795	398	931	0.67	26.7	C	709	393	680	0.49	30.9	B	707	310	843	0.60	28.5	B	562
Crocker Road W/ River Road	238	178	323	0.20	49.9	A	253	162	314	0.20	49.9	A	126	66	211	0.13	50.0	A	165
D Street S/ San Antonio Road	445	85	495	0.31	49.5	A	222	48	195	0.12	50.0	A	344	0	410	0.26	49.7	A	182
Dry Creek Road N/ Lambert Bridge Road	171	145	274	0.17	49.9	A	220	200	361	0.23	49.8	A	117	91	220	0.14	50.0	A	178
East Cotati Avenue W/ Petaluma Hill Road	675	511	915	0.82	19.6	D	1,025	753	1,177	1.05	11.5	F	453	289	693	0.62	26.9	B	693
East Washington Street S/ Adobe Road	291	55	322	0.25	49.7	A	230	73	370	0.29	49.4	A	258	22	289	0.23	49.8	A	203
Eastside Road N/ Trenton-Healdsburg Road	552	407	524	0.35	39.3	A	402	140	244	0.16	40.0	A	331	186	303	0.20	39.9	A	350
Eighth Street East N/ S.H 12/ 121	195	40	128	0.11	40.0	A	355	185	272	0.23	39.8	A	205	50	138	0.12	40.0	A	178
Eighth Street East S/ East Napa Street	385	185	412	0.32	49.1	A	281	113	247	0.19	49.9	A	246	46	273	0.21	49.8	A	201
Fifth Street West N/ Leveroni Road	476	123	580	0.52	29.7	B	409	31	455	0.41	31.7	A	406	53	510	0.46	31.0	B	362
Frates Road S/ Adobe Road	714	231	771	0.60	41.2	B	449	292	585	0.46	46.7	A	628	145	685	0.54	44.1	A	206
Fulton Road S/ River Road	1,731	1,150	2,033	1.59	4.4	F	2,919	2,135	3,106	2.43	0.9	F	1,062	481	1,364	1.07	16.1	F	1,489
Fulton Road N/ River Road	1,761	1,159	1,928	1.51	5.3	F	3,740	2,806	3,614	2.82	0.5	F	970	368	1,137	0.89	24.8	D	1,625
Graton Road W/ Green Hill Road	235	88	215	0.14	40.0	A	85	53	265	0.18	40.0	A	182	35	162	0.11	40.0	A	60
Guerneville Road E/ Frei Road	696	470	895	0.56	44.8	B	2,003	1,443	2,147	1.34	10.4	F	374	148	573	0.36	49.1	A	958
Guerneville Road E/ Vine Hill Road	2,003	1,443	792	0.50	46.7	B	696	470	1,434	0.90	28.5	E	958	398	754	0.47	47.3	A	374
Laguna Road N/ Guerneville Road	210	94	239	0.16	40.0	A	231	117	247	0.16	40.0	A	178	62	207	0.14	40.0	A	198
Lakeville Road N/ Hwy 37	871	441	1,798	1.12	17.4	F	628	247	811	0.51	46.4	B	541	111	1,468	0.92	27.3	E	492
Leveroni Road E/ Arnold Drive	1,018	398	759	0.59	41.6	B	985	365	816	0.64	39.4	B	765	145	506	0.40	48.1	A	693
Llano Road N/ Ludwig Avenue	226	61	533	0.33	49.3	A	151	96	367	0.23	49.8	A	183	18	490	0.31	49.5	A	133
Madrone Road W/ S.H. 12	246	89	356	0.30	39.5	A	415	264	464	0.39	38.7	A	161	4	271	0.23	39.8	A	166
Main Street S/ Adobe Road (Penngrove)	1,809	815	1,809	2.58	0.2	F	1,194	602	1,194	1.71	1.1	F	1,007	13	732	1.05	6.1	F	847
Mark West Springs Road E/ Highway 101	1,612	1,252	2,074	1.30	5.8	F	1,354	1,024	1,832	1.15	8.8	F	1,165	805	1,627	1.02	12.4	F	974
Mark West Springs Road W/ Porter Creek Road	267	36	375	0.29	49.4	A	262	33	421	0.33	49.1	A	247	16	355	0.28	49.5	A	251
Mecham Road S/ Dump	166	84	262	0.20	49.9	A	110	63	147	0.11	50.0	A	112	30	208	0.16	49.9	A	72
Millbrae Avenue E/ Stony Point Road	127	61	271	0.34	38.9	A	217	116	425	0.53	34.3	B	109	43	253	0.32	39.2	A	131
Mirabel Road S/ Trenton Road	270	189	577	0.48	37.0	A	466	356	664	0.55	35.1	B	124	43	431	0.36	39.0	A	219
Mountain View Avenue E/ Santa Rosa Avenue	110	52	279	0.25	32.8	A	158	103	551	0.49	30.3	B	193	135	312	0.28	32.7	A	194
Napa Road E/ Burndale Road	759	142	781	0.61	40.8	B	641	97	783	0.61	40.7	B	673	56	695	0.54	43.8	A	570
Occidental Road E/ Mill Station Road	101	50	262	0.20	49.9	A	344	178	547	0.43	47.4	A	76	25	237	0.19	49.9	A	241
Occidental Road W/ Sanford Road	455	262	720	0.60	33.5	B	537	128	980	0.82	24.0	D	266	73	531	0.44	37.8	A	494
Old Redwood Highway S/ Ursuline Road	2,984	2,350	3,439	2.87	0.4	F	2,646	1,620	2,150	1.79	2.4	F	1,325	691	1,780	1.48	4.8	F	1,711
Old Redwood Highway N/ Fulton Road	2,076	1,476	2,103	1.75	2.6	F	1,518	1,022	1,488	1.24	8.8	F	1,186	586	1,213	1.01	15.6	F	836
Old Redwood Highway N/ Eastside Road	629	421	723	0.45	47.7	A	1,164	794	1,114	0.70	39.2	C	416	208	510	0.32	49.4	A	640
Old Redwood Highway North N/ Ely Road	2,497	1,677	3,073	2.56	0.6	F	1,095	573	1,169	0.97	17.0	E	1,485	665	2,061	1.72	2.8	F	795
Pepper Road E/ Walker Road	169	87	312	0.20	49.9	A	121	74	195	0.12	50.0	A	113	31	256	0.16	50.0	A	77
Petaluma Avenue E/ Arnold Drive	1,092	562	834	0.74	22.4	C	1,470	744	978	0.87	17.4	D	747	217	489	0.44	31.3	A	747
Petaluma Boulevard North N/ Skillman Lane	1,555	720	1,713	1.34	8.0	F	985	491	1,373	1.07	15.8	F	1,051	216	1,209	0.94	21.8	E	653
Petaluma Hill Road N/ Roberts	2,970	1,489	2,637	2.06	1.6	F	1,882	1,187	1,835	1.43	6.3	F	1,724	243	1,391	1.09	15.3	F	1,109
Petaluma Hill Road N/ Snyder Lane	2,784	1,244	2,321	1.81	2.7	F	4,248	3,398	4,280	3.34	0.2	F	1,345	0	1,345	1.05	16.7	F	2,202
Piner Road E/ Willowside Road	157	73	179	0.15	40.0	A	497	405	598	0.50	36.6	B	100	16	122	0.10	40.0	A	214
Pleasant Hill Road S/ Watertrough Road	150	97	228	0.19	39.9	A	201	103	213	0.18	39.9	A	81	28	159	0.13	40.0	A	134
River Road W/ Mirabel Road	674	330	887	0.55	45.0	B	1,264	740	1,547	0.97	24.7	E	505	161	718	0.45	47.7	A	684
River Road Btw Olivet Rd. & Slusser Rd.	626	346	626	0.39	48.7	A	1,591	1,099	1,591	0.99	23.3	E	405	125	405	0.25	49.8	A	735
River Road W/ Fulton Road	894	388	923	0.58	44.2	B	1,962	1,231	1,853	1.16	16.1	F	624	118	653	0.41	48.4	A	1,031
Riverside Drive N/ S.H. 12	1,395	480	1,042	1.00	10.0	F	1,376	434	933	0.90	12.9	D	1,009	94	656	0.63	21.3	B	1,089
Roblar Road E/ Canfield Road	141	99	158	0.10	50.0	A	331	170	257	0.16	50.0	A	78	36	95	0.06	50.0	A	191
Rohnert Park Expressway E/ Stony Point Road	799	455	1,047	0.87	21.4	D	980	519	1,497	1.25	8.6	F	564	220	812	0.68	30.4	C	547
Rohnert Park Expressway W/ Petaluma Hill Road	613	204	590	0.46	46.6	A	967	521	864	0.68	37.3	B	481	72	458	0.36	48.7	A	766
Santa Rosa Avenue N/ Mountain View Avenue	956	454	1,704	1.42	5.6	F	1,094	802	1,468	1.22	9.2	F	654	152	1,402	1.17	10.5	F	970
Skillman Lane E/ Thompson Lane	192	72	227	0.19	39.9	A	210	58	240	0.20	39.9	A	189	69	224	0.19	39.9	A	211
Skylane Boulevard N/ Airport Boulevard	1,862	1,639	1,924	1.60	3.7	F	719	510	737	0.61	33.0	B	658	435	720	0.60	33.5	B	286
Snyder Lane S/ Petaluma Hill Road	668	218	735	0.57	42.5	A	1,493	1,122	1,650	1.29	9.1	F	341	0	517	0.40	47.9	A	750
Stony Point Road S/ Mecham Road	1,409	653	1,506	0.94	26.0	E	795	453	781	0.49	46.9	B	978	222	1,075	0.67	40.3	C	405
Stony Point Road N/ Roblar Road	1,553	744	1,672	1.31	8.7	F	1,074	593	1,133	0.89	25.0	D	1,060	251	1,179	0.92	23.0	E	560
Stony Point Road N/ S.H. 116	1,785	1,109	1,770	1.38	7.2	F	2,182	1,635	2,174	1.70	3.4	F	1,107	431	1,092	0.85	26.8	D	1,117
Stony Point Road N/ Scenic Avenue	2,137	1,090	2,184	1.71	3.4	F	2,204	1,376	2,068	1.62	4.1	F	1,224	177	1,271	0.99	19.3	E	1,233
Todd Road E/ Stony Point Road	571	448	787	0.66	31.3	B	757	401	733	0.61	33.1	B	343	220	559	0.47	37.4	A	599
Tomales Road W/ Bodega Avenue	269	46	297	0.19	49.9	A	129	30	163	0.10	50.0	A	208	0	251	0.16	50.0	A	110
Trinity Road E/ S.H. 12	47	16	52	0.05	27.0	A	44	6	64	0.06	27.0	A	42	11	47	0.05	27.0	A	35
Valley Ford Road E/ Gericke Road	455	245	443	0.28	49.7	A	606	331	507	0.32	49.4	A	332	122	320	0.20	49.9	A	413
Verano Avenue W/ S.H. 12	657	183	617	0.82	16.1	D	676	222	762	1.02	9.6	F	514	40	474	0.63	24.1	B	466
Warm Springs Road N/ Sonoma Mt Road	199	81	521	0.47	30.8	B	220	133	550	0.49	30.3	B	375	257	476	0.43	31.4	A	472
Watmaugh Road E/ Arnold Drive	113	11	138	0.11	50.0	A	115	34	209	0.16	49.9	A	103	1	128	0.10	50.0	A	98
Westside Road N/ Felta Road	301	211	355	0.24	39.8	A	239	148	265	0.18	40.0	A	144	54	198	0.13	40.0	A	122

Exhibit 7.6-2 Traffic Model Data for the PM Peak Hour

Locations (Highlighting means capacity added in Preferred Alts. 2/10)	District/ Corridor	Ratio wknd/ wkdy	Facility Type	Max. Speed	Speed V/C=1	PM Pk Count N or E Vol.	N or E Cap.	N or E V/C	N or E Speed	N or E LOS	PM Pk Count S or W Vol.	S or W Cap.	S or W V/C	S or W Speed	S or W LOS
Caltrans (State-owned) Highways															
S.H. 1 W/ Bodega Hwy	South Coastal	1.60	ART1	40	13	295	800	0.3688	38.5	*A*	237	800	0.29625	39.4	*A*
S.H. 12 S/ Warm Springs Rd.	Sonoma Valley	1.00	Rural A	55	27	840	1,600	0.525	51.0	*A*	653	1,600	0.40813	53.5	*A*
S.H. 12 S/ Pythian Rd.	Sonoma Valley	1.00	Rural A	55	27	841	1,600	0.5256	51.0	*A*	762	1,600	0.47625	52.2	*A*
S.H. 12 N/ Agua Caliente	Sonoma Valley	1.10	ART1	50	25	628	800	0.785	36.2	*A*	690	800	0.8625	32.2	*B*
S.H. 12 N/ Boyes Blvd.	Sonoma Valley	1.10	ART3	35	17	895	700	1.2786	9.1	*D*	735	700	1.05	15.3	*C*
S.H. 12 E/ Llano Rd.	Santa Rosa SR 12 West Area	1.10	RSA	50	19	1,523	1,280	1.1898	11.7	*F*	921	1,280	0.71953	34.8	*C*
S.H. 12 S/ Verano Rd.	Sonoma Urban	1.10	ART3	30	15	1,048	700	1.4971	5.0	*F*	1,122	700	1.60286	3.9	*F*
S.H. 37 W/ Lakeville Hwy.	Lakeville	0.50	FWY	60	30	2,943	3,330	0.8838	37.3	*E*	813	3,330	0.24414	59.8	*B*
S.H. 37 Btw Lakeville & S.H. 121	Lakeville	0.50	FWY	60	30	2,093	3,330	0.6285	51.9	*B*	1,345	3,330	0.4039	58.4	*B*
S.H. 37 E/ Hwy 121	Lakeville	0.50	Rural A	50	23	1,097	1,600	0.6856	39.7	*C*	753	1,600	0.47063	47.3	*A*
S.H. 116 E/ Adobe Rd.	SR-116 Stage Gulch Road	1.15	Rural B	40	18	1,254	1,500	0.836	25.0	*D*	798	1,500	0.532	36.4	*B*
S.H. 116 Guerneville Br over Russian River	SR-116 Sebastapol to Guerneville	1.40	Rural A	50	23	146	1,600	0.0913	50.0	*A*	140	1,600	0.0875	50.0	*A*
S.H. 116 N/ Guerneville Rd.	SR-116 Sebastapol to Guerneville	1.40	Rural A	50	23	82	1,600	0.0513	50.0	*A*	247	1,600	0.15438	50.0	*A*
S.H. 116 S/ Occidental Rd.	SR-116 Sebastapol to Guerneville	1.40	Rural A	50	23	493	1,600	0.3081	49.5	*A*	484	1,600	0.3025	49.5	*A*
S.H. 116 S/ Adobe Rd.	SR-116 Stage Gulch Road	1.15	Rural B	40	18	677	1,500	0.4513	38.1	*A*	918	1,500	0.612	34.1	*B*
S.H. 116 W/ Stony Point Rd.	SR-116 Rohnert Park to Sebastapol	1.20	Rural A	50	23	535	1,600	0.3344	49.3	*A*	1,289	1,600	0.80563	33.5	*D*
S.H. 116 N/ Hwy 121	South Sonoma/ Hwy 121 Area	1.00	Rural A	50	23	810	1,600	0.5063	46.4	*B*	531	1,600	0.33188	49.3	*A*
S.H. 121 E/ Napa Rd.	South Sonoma/ Hwy 121 Area	1.30	Rural A	50	23	1,225	3,200	0.3828	48.8	*A*	1,114	3,200	0.34813	49.2	*A*
S.H. 121 S/ Junction Hwy. 116	South Sonoma/ Hwy 121 Area	1.00	Rural A	50	23	1,022	1,600	0.6388	41.8	*C*	556	1,600	0.3475	49.2	*A*
S.H. 121 N/ Hwy 37	South Sonoma/ Hwy 121 Area	1.30	Rural A	50	23	769	1,600	0.4806	47.1	*A*	455	1,600	0.28438	49.6	*A*
S.H. 128 W/ Chalk Hill Rd.	Healdsburg	0.80	ART1	40	13	68	800	0.085	40.0	*A*	68	800	0.085	40.0	*A*
S.H. 128 @ Napa County Line	Healdsburg	1.20	ART1	40	13	82	800	0.1025	40.0	*A*	99	800	0.12375	40.0	*A*

Locations	Alt 2 North or Eastbound: Raw N or E Vol	N or E Additive	N or E Vol.	N or E V/C	N or E Speed	N or E LOS	Alt 2 South or Westbound: S or W Vol	S or W Additive	S or W Vol.	S or W V/C	S or W Speed	S or W LOS
S.H. 1 W/ Bodega Hwy	382	87	382	0.48	36.1	*A*	299	62	299	0.37	38.4	*A*
S.H. 12 S/ Warm Springs Rd.	1,165	350	1,190	0.74	41.8	*C*	1,156	367	1,020	0.64	47.0	*B*
S.H. 12 S/ Pythian Rd.	1,075	287	1,128	0.71	43.8	*B*	1,152	325	1,087	0.68	45.0	*B*
S.H. 12 N/ Agua Caliente	870	1	629	0.79	36.2	*A*	884	149	839	1.05	22.6	*C*
S.H. 12 N/ Boyes Blvd.	1,148	217	1,112	1.59	4.5	*F*	1,024	279	1,014	1.45	6.2	*F*
S.H. 12 E/ Llano Rd.	1,194	575	2,098	0.82	28.80	*C*	1,657	684	1,605	0.63	39.9	*B*
S.H. 12 S/ Verano Rd.	781	91	1,139	1.63	3.75	*F*	843	144	1,266	1.81	2.6	*F*
S.H. 37 W/ Lakeville Hwy.	2,945	943	3,886	1.17	21.02	*F*	0	0	813	0.24	59.8	*B*
S.H. 37 Btw Lakeville & S.H. 121	3,078	985	3,078	0.92	34.68	*E*	0	0	1,345	0.40	58.4	*B*
S.H. 37 E/ Hwy 121	1,791	504	1,601	1.00	22.97	*F*	915	145	898	0.56	44.8	*B*
S.H. 116 E/ Adobe Rd.	2,308	1,054	2,308	1.54	5.10	*F*	851	53	851	0.57	35.5	*B*
S.H. 116 Guerneville Br over Russian River	220	74	220	0.14	49.98	*A*	228	88	228	0.14	50.0	*A*
S.H. 116 N/ Guerneville Rd.	142	60	142	0.09	50.00	*A*	319	72	319	0.20	49.9	*A*
S.H. 116 S/ Occidental Rd.	674	181	674	0.42	48.22	*A*	570	86	570	0.36	49.1	*A*
S.H. 116 S/ Adobe Rd.	497	258	935	0.62	33.77	*C*	62	26	944	0.63	33.6	*C*
S.H. 116 W/ Stony Point Rd.	804	147	682	0.30	49.50	*A*	1,279	217	1,506	0.67	40.3	*C*
S.H. 116 N/ Hwy 121	588	106	916	0.57	44.40	*B*	682	146	677	0.42	48.2	*A*
S.H. 121 E/ Napa Rd.	1,835	456	1,681	0.53	45.90	*B*	1,297	276	1,390	0.43	48.0	*A*
S.H. 121 S/ Junction Hwy. 116	1,498	530	1,552	0.97	24.52	*E*	890	149	705	0.44	47.9	*A*
S.H. 121 N/ Hwy 37	1,498	530	1,299	0.81	33.11	*D*	890	149	604	0.38	48.8	*A*
S.H. 128 W/ Chalk Hill Rd.	163	95	163	0.20	39.86	*A*	240	172	240	0.30	39.3	*A*
S.H. 128 @ Napa County Line	93	11	93	0.12	39.98	*A*	85	0	99	0.12	40.0	*A*

Locations	Alt 3: N or E Vol	N or E Additive	N or E Vol.	N or E V/C	N or E Speed	N or E LOS	Alt 3: S or W Vol	S or W Additive	S or W Vol.	S or W V/C	S or W Speed	S or W LOS	N or E Vol	N or E Additive	Alt 4: N or E Vol.	N or E V/C	N or E Speed	N or E LOS	S or W Vol
S.H. 1 W/ Bodega Hwy	526	231	526	0.66	28.8	*B*	343	106	343	0.43	37.4	*A*	355	60	355	0.44	37.0	*A*	299
S.H. 12 S/ Warm Springs Rd.	1,580	765	1,605	1.00	26.8	*E*	1,460	671	1,324	0.83	37.0	*C*	1,049	234	1,074	0.67	45.4	*B*	1,203
S.H. 12 S/ Pythian Rd.	1,306	518	1,359	0.85	35.7	*C*	1,365	538	1,300	0.81	37.9	*C*	944	156	997	0.62	47.6	*A*	1,173
S.H. 12 N/ Agua Caliente	1,308	439	1,067	1.33	12.0	*F*	1,335	600	1,290	1.61	6.4	*F*	1,008	139	767	0.96	27.1	*C*	1,068
S.H. 12 N/ Boyes Blvd.	1,688	757	1,652	2.36	1.0	*F*	1,636	891	1,626	2.32	1.1	*F*	1,260	329	1,224	1.75	3.2	*F*	1,245
S.H. 12 E/ Llano Rd.	954	335	1,858	1.45	6.1	*F*	1,309	336	1,257	0.98	19.9	*E*	812	193	1,716	1.34	8.0	*F*	1,149
S.H. 12 S/ Verano Rd.	1,287	597	1,645	2.35	1.0	*F*	1,262	563	1,685	2.41	0.9	*F*	890	200	1,248	1.78	2.7	*F*	903
S.H. 37 W/ Lakeville Hwy.	2,739	737	3,680	1.11	24.1	*F*	1,579	372	1,185	0.36	59.1	*B*	2,544	542	3,485	1.05	27.3	*F*	1,508
S.H. 37 Btw Lakeville & S.H. 121	2,911	818	2,911	0.87	37.9	*E*	2,038	693	2,038	0.61	52.6	*B*	2,677	584	2,677	0.80	42.3	*D*	1,633
S.H. 37 E/ Hwy 121	1,919	632	1,729	1.08	19.2	*F*	1,350	580	1,333	0.83	31.9	*D*	1,698	411	1,508	0.94	26.0	*E*	912
S.H. 116 E/ Adobe Rd.	2,063	809	2,063	1.38	7.4	*F*	1,719	921	1,719	1.15	12.9	*F*	1,743	489	1,743	1.16	12.4	*F*	1,048
S.H. 116 Guerneville Br over Russian River	525	379	525	0.33	49.3	*A*	459	319	459	0.29	49.6	*A*	230	84	230	0.14	50.0	*A*	219
S.H. 116 N/ Guerneville Rd.	454	372	454	0.28	49.6	*A*	842	595	842	0.53	45.9	*B*	196	114	196	0.12	50.0	*A*	384
S.H. 116 S/ Occidental Rd.	1,293	800	1,293	0.81	33.3	*D*	897	413	897	0.56	44.8	*B*	714	221	714	0.45	47.8	*A*	578
S.H. 116 S/ Adobe Rd.	389	150	827	0.55	35.9	*B*	181	145	1,063	0.71	30.6	*C*	342	103	780	0.52	36.7	*B*	62
S.H. 116 W/ Stony Point Rd.	1,309	652	1,187	0.74	36.9	*C*	2,151	1,089	2,378	1.49	7.4	*F*	890	233	768	0.48	47.1	*A*	1,231
S.H. 116 N/ Hwy 121	828	346	1,156	0.72	37.9	*C*	839	303	834	0.52	46.0	*B*	464	0	810	0.51	46.4	*B*	653
S.H. 121 E/ Napa Rd.	2,039	660	1,885	0.59	43.8	*B*	1,532	511	1,625	0.51	46.4	*B*	1,806	427	1,652	0.52	46.2	*B*	1,296
S.H. 121 S/ Junction Hwy. 116	1,394	426	1,448	0.91	28.0	*E*	741	0	609	0.38	48.8	*A*	1,193	225	1,247	0.78	34.9	*D*	935
S.H. 121 N/ Hwy 37	1,394	426	1,195	0.75	36.6	*C*	964	223	678	0.42	48.2	*A*	1,193	225	994	0.62	42.6	*C*	935
S.H. 128 W/ Chalk Hill Rd.	319	251	319	0.40	38.0	*A*	351	283	351	0.44	37.1	*A*	150	82	150	0.19	39.9	*A*	217
S.H. 128 @ Napa County Line	110	28	110	0.14	40.0	*A*	108	9	108	0.14	40.0	*A*	88	6	88	0.11	40.0	*A*	88

Exhibit 7.6-2 Traffic Model Data for the PM Peak Hour

Weekend PM Peak Hour

	Alt 4				Alt 5	Alt 5	Alt 5				Alt 5	Alt 5	Alt 5				Alt 6	Alt 6	Alt 6				Alt 6	Alt 6	Alt 6					Alt 7	Alt 7	Alt 7				Alt 7	Alt 7	Alt 7				Alt 8	Alt 8	Alt 8				Alt 8	Alt 8	Alt 8			
S or W Additive	S or W Vol.	S or W V/C	S or W Speed	S or W LOS	N or E Vol	N or E Additive	N or E Vol.	N or E V/C	N or E Speed	N or E LOS	S or W Vol	S or W Additive	S or W Vol.	S or W V/C	S or W Speed	S or W LOS	N or E Vol	N or E Additive	N or E Vol.	N or E V/C	N or E Speed	N or E LOS	S or W Vol	S or W Additive	S or W Vol.	S or W V/C	S or W Speed	S or W LOS	New Alt 7 Capacity	N or E Vol	N or E Additive	N or E Vol.	N or E V/C	N or E Speed	N or E LOS	raw S or W Vol	S or W Additive	S or W Vol.	S or W V/C	S or W Speed	S or W LOS	N or E Vol	N or E Additive	N or E Vol.	N or E V/C	N or E Speed	N or E LOS	S or W Vol	S or W Additive	S or W Vol.	S or W V/C	S or W Speed	S or W LOS
286	1,187	0.93	22.7	*E*	505	16	539	0.42	47.6	*A*	1044	242	1,143	0.89	24.5	*D*	625	136	659	0.51	44.9	*A*	1213	411	1,177	0.92	23.1	*D*	1,280	547	58	581	0.45	46.8	*A*	842	40	941	0.74	33.9	*C*	621.9	57	679	0.53	44.3	*A*	1,068	38	1,106	0.86	26.2	*D*
296	1,080	0.68	40.2	*C*	874	187	656	0.41	48.4	*A*	1133	242	1,026	0.64	41.7	*C*	976	289	758	0.47	47.2	*A*	1264	373	1,050	0.66	41.1	*C*	1,600	958	271	740	0.46	47.5	*A*	1055	164	948	0.59	43.7	*B*	720	103	823	0.51	46.2	*B*	972	68	1,040	0.65	41.3	*C*
236	907	0.57	44.6	*B*	1235	226	901	0.56	44.7	*B*	875	125	796	0.50	46.6	*B*	1328	319	994	0.62	42.6	*C*	973	223	894	0.56	44.9	*B*	1,600	1303	294	969	0.61	43.2	*B*	979	229	900	0.56	44.7	*B*	959.4	118	1,077	0.67	40.3	*C*	816	95	911	0.57	44.5	*B*
36	222	0.20	32.9	*A*	189	37	213	0.19	32.9	*A*	167	48	234	0.21	32.9	*A*	218	66	242	0.22	32.9	*A*	150	31	217	0.19	32.9	*A*	1,568	247	95	242	0.15	33.0	*A*	182	63	217	0.14	33.0	*A*	253	1	254	0.23	32.9	*A*	244	2	246	0.22	32.9	*A*
378	952	1.19	7.7	*F*	1517	541	1,454	1.82	1.7	*F*	670	407	952	1.19	7.7	*F*	1526	550	1,463	1.83	1.7	*F*	627	364	938	1.17	8.1	*F*	1,600	1414	438	1,351	0.84	19.5	*D*	620	357	931	0.58	32.3	*B*	514.15	4	518	0.65	29.3	*B*	333	3	336	0.42	37.6	*A*
51	204	0.16	49.9	*A*	45	28	293	0.23	49.8	*A*	87	47	200	0.16	50.0	*A*	44	27	292	0.23	49.8	*A*	86	46	199	0.16	50.0	*A*	1,280	41	24	289	0.23	49.8	*A*	85	45	198	0.15	50.0	*A*	383.5	9	393	0.31	49.3	*A*	265	11	276	0.22	49.8	*A*
146	698	0.55	43.7	*A*	1372	387	1,140	0.89	24.7	*D*	768	130	682	0.53	44.2	*A*	1373	388	1,140	0.89	24.7	*D*	765	127	679	0.53	44.3	*A*	1,792	1526	541	1,386	0.77	31.6	*C*	845	207	759	0.42	47.5	*A*	946.2	83	1,029	0.80	29.7	*C*	579	49	628	0.49	45.7	*A*
93	1,188	0.99	16.4	*E*	1324	0	1,376	1.15	11.1	*F*	1059	0	1,188	0.99	16.4	*E*	1458	86	1,376	1.15	11.1	*F*	1177	82	1,177	0.98	16.7	*E*	1,680	1753	381	1,296	0.77	26.1	*C*	1428	333	1,052	0.63	32.5	*B*	1142.1	77	1,219	1.02	15.4	*F*	986	44	1,030	0.86	22.0	*D*
198	779	0.61	40.9	*B*	799	20	593	0.46	46.5	*A*	782	49	630	0.49	45.6	*A*	928	149	686	0.54	44.1	*A*	929	196	777	0.61	40.9	*B*	1,792	1164	385	958	0.53	44.1	*A*	1158	425	1,006	0.56	43.0	*A*	569.38	71	640	0.50	45.4	*A*	647	32	679	0.53	44.3	*A*
72	368	0.29	49.4	*A*	298	66	295	0.23	49.8	*A*	369	73	368	0.29	49.4	*A*	290	58	290	0.23	49.8	*A*	376	80	368	0.29	49.4	*A*	1,280	285	53	285	0.22	49.8	*A*	368	72	368	0.29	49.4	*A*	324.5	19	344	0.27	49.6	*A*	405	16	421	0.33	49.1	*A*
469	822	0.51	46.2	*B*	695	435	1,083	0.68	40.1	*C*	640	404	757	0.47	47.2	*A*	767	507	1,155	0.72	37.9	*C*	728	492	822	0.51	46.2	*B*	1,600	758	498	1,146	0.72	38.2	*C*	686	450	803	0.50	46.5	*B*	1510.6	8	1,519	0.95	25.6	*E*	1,069	12	1,081	0.68	40.2	*C*
180	554	0.35	49.2	*A*	423	126	425	0.27	49.7	*A*	733	251	625	0.39	48.7	*A*	397	100	399	0.25	49.8	*A*	734	252	554	0.35	49.2	*A*	1,600	394	97	396	0.25	49.8	*A*	690	208	582	0.36	49.0	*A*	574	159	733	0.46	47.5	*A*	776	100	876	0.55	45.2	*B*
9	467	0.31	39.5	*A*	367	116	556	0.37	39.1	*A*	507	36	494	0.33	39.4	*A*	342	91	524	0.35	39.3	*A*	491	20	467	0.31	39.5	*A*	2,100	350	99	539	0.26	39.8	*A*	612	141	599	0.29	39.7	*A*	592.12	31	623	0.42	38.6	*A*	528	10	538	0.36	39.2	*A*
56	136	0.10	27.0	*A*	166	80	193	0.15	27.0	*A*	127	61	141	0.11	27.0	*A*	164	78	176	0.14	27.0	*A*	125	59	136	0.10	27.0	*A*	1,300	157	71	184	0.14	27.0	*A*	103	37	117	0.09	27.0	*A*	198.88	3	202	0.16	27.0	*A*	154	15	169	0.13	27.0	*A*
8	173	0.25	26.7	*A*	229	42	286	0.41	25.0	*A*	213	24	173	0.25	26.7	*A*	198	11	286	0.41	25.0	*A*	204	15	173	0.25	26.7	*A*	700	213	26	312	0.45	24.3	*B*	170	0	165	0.24	26.8	*A*	257.4	1	258	0.37	25.6	*A*	156	5	161	0.23	26.8	*A*
0	323	0.46	23.9	*B*	300	0	377	0.54	21.8	*B*	328	0	323	0.46	23.9	*B*	299	0	377	0.54	21.8	*B*	330	0	323	0.46	23.9	*B*	700	281	0	377	0.54	21.8	*B*	265	0	323	0.46	23.9	*B*	339.3	1	340	0.49	23.3	*B*	291	5	296	0.42	24.7	*B*
9	245	0.19	27.0	*A*	284	57	306	0.24	26.9	*A*	256	11	245	0.19	27.0	*A*	283	56	306	0.24	26.9	*A*	246	1	237	0.18	27.0	*A*	1,300	277	50	309	0.24	26.9	*A*	236	0	236	0.18	27.0	*A*	244.8	193	438	0.34	26.6	*A*	196	123	319	0.25	26.9	*A*
24	126	0.10	50.0	*A*	211	0	105	0.08	50.0	*A*	48	0	102	0.08	50.0	*A*	317	94	199	0.16	50.0	*A*	100	13	115	0.09	50.0	*A*	1,280	190	0	105	0.08	50.0	*A*	93	6	108	0.08	50.0	*A*	137.7	11	149	0.12	50.0	*A*	113	16	129	0.10	50.0	*A*
1	76	0.06	27.0	*A*	81	0	90	0.07	27.0	*A*	56	20	76	0.06	27.0	*A*	81	0	90	0.07	27.0	*A*	55	19	76	0.06	27.0	*A*	1,300	83	2	92	0.07	27.0	*A*	64	28	103	0.08	27.0	*A*	117	18	135	0.10	27.0	*A*	99	18	117	0.09	27.0	*A*
122	356	0.30	39.5	*A*	471	216	580	0.48	37.0	*B*	278	92	326	0.27	39.7	*A*	559	304	651	0.54	35.4	*B*	302	116	350	0.29	39.6	*A*	1,200	451	196	560	0.47	37.3	*A*	281	95	329	0.27	39.7	*A*	585.9	39	625	0.52	36.0	*B*	320	28	348	0.29	39.6	*A*
246	533	0.38	32.2	*A*	725	328	843	0.60	28.5	*B*	550	234	521	0.37	32.3	*A*	713	316	843	0.60	28.5	*B*	558	242	529	0.38	32.2	*A*	1,400	642	245	778	0.56	29.6	*B*	512	196	483	0.35	32.4	*A*	843	11	854	0.61	28.3	*B*	533	7	540	0.39	32.1	*A*
74	226	0.14	50.0	*A*	127	67	211	0.13	50.0	*A*	166	75	226	0.14	50.0	*A*	128	68	211	0.13	50.0	*A*	166	75	226	0.14	50.0	*A*	1,600	129	69	214	0.13	50.0	*A*	166	75	227	0.14	50.0	*A*	253.2	6	259	0.16	50.0	*A*	271	5	276	0.17	49.9	*A*
8	155	0.10	50.0	*A*	344	0	410	0.26	49.7	*A*	180	6	153	0.10	50.0	*A*	344	0	410	0.26	49.7	*A*	179	5	152	0.10	50.0	*A*	1,600	344	0	410	0.26	49.7	*A*	179	5	152	0.10	50.0	*A*	451	95	546	0.34	49.2	*A*	171	93	264	0.16	50.0	*A*
158	319	0.20	49.9	*A*	107	81	210	0.13	50.0	*A*	154	134	295	0.18	49.9	*A*	117	91	220	0.14	50.0	*A*	161	141	302	0.19	49.9	*A*	1,600	119	93	222	0.14	50.0	*A*	171	151	312	0.20	49.9	*A*	440	2	442	0.28	49.7	*A*	638	5	643	0.40	48.5	*A*
421	845	0.75	22.0	*C*	502	338	742	0.66	25.5	*C*	692	420	844	0.75	22.1	*C*	467	303	707	0.63	26.5	*B*	691	419	843	0.75	22.1	*C*	1,120	288	124	528	0.47	30.7	*B*	600	328	752	0.67	25.1	*C*	623.7	0	624	0.56	28.7	*B*	761	1	762	0.68	24.8	*C*
46	343	0.27	49.6	*A*	259	23	290	0.23	49.8	*A*	145	0	297	0.23	49.8	*A*	250	14	281	0.22	49.8	*A*	177	20	317	0.25	49.7	*A*	1,280	248	12	279	0.22	49.8	*A*	189	32	329	0.26	49.6	*A*	260.1	9	269	0.21	49.8	*A*	309	5	314	0.25	49.7	*A*
88	192	0.13	40.0	*A*	338	193	310	0.21	39.9	*A*	347	85	189	0.13	40.0	*A*	330	185	302	0.20	39.9	*A*	351	89	191	0.13	40.0	*A*	1,500	271	126	243	0.16	40.0	*A*	296	34	138	0.09	40.0	*A*	363.6	35	399	0.27	39.8	*A*	230	19	249	0.17	40.0	*A*
8	95	0.08	40.0	*A*	211	56	138	0.12	40.0	*A*	180	10	95	0.08	40.0	*A*	215	60	138	0.12	40.0	*A*	175	5	92	0.08	40.0	*A*	1,680	208	53	141	0.08	40.0	*A*	168	0	87	0.05	40.0	*A*	151.8	1	153	0.13	40.0	*A*	105	6	111	0.09	40.0	*A*
33	167	0.13	50.0	*A*	274	74	273	0.21	49.8	*A*	247	79	167	0.13	50.0	*A*	257	57	273	0.21	49.8	*A*	204	36	167	0.13	50.0	*A*	1,792	251	51	278	0.16	50.0	*A*	213	45	179	0.10	50.0	*A*	300.3	20	320	0.25	49.7	*A*	184	27	211	0.16	49.9	*A*
0	424	0.38	32.0	*A*	410	57	510	0.46	31.0	*B*	368	0	424	0.38	32.0	*A*	417	64	510	0.46	31.0	*B*	346	0	424	0.38	32.0	*A*	1,120	389	36	493	0.44	31.2	*A*	307	0	424	0.38	32.0	*A*	459	9	468	0.42	31.5	*A*	382	12	394	0.35	32.2	*A*
49	342	0.27	49.6	*A*	619	136	676	0.53	44.4	*A*	164	7	300	0.23	49.8	*A*	646	163	676	0.53	44.4	*A*	220	63	300	0.23	49.8	*A*	1,280	532	49	589	0.46	46.6	*A*	209	52	345	0.27	49.6	*A*	616.5	35	652	0.51	45.1	*A*	308	42	350	0.27	49.5	*A*
705	1,676	1.31	8.6	*F*	1041	460	1,343	1.05	16.8	*F*	1466	682	1,653	1.29	9.0	*F*	1072	491	1,364	1.07	16.1	*F*	1485	701	1,672	1.31	8.7	*F*	2,560	1149	568	1,451	0.57	42.8	*A*	1589	805	1,776	0.69	36.3	*B*	1091.2	0	1,091	0.85	26.9	*D*	1,341	0	1,341	1.05	16.9	*F*
691	1,499	1.17	12.3	*F*	984	382	1,137	0.89	24.8	*D*	1626	692	1,499	1.17	12.3	*F*	985	383	1,137	0.89	24.8	*D*	1635	701	1,499	1.17	12.3	*F*	2,560	874	272	1,041	0.41	47.9	*A*	1252	318	1,126	0.44	47.1	*A*	909.6	18	928	0.72	34.5	*C*	1,199	20	1,219	0.95	21.3	*E*
28	240	0.16	40.0	*A*	176	29	156	0.10	40.0	*A*	57	25	237	0.16	40.0	*A*	181	34	161	0.11	40.0	*A*	57	25	237	0.16	40.0	*A*	1,500	165	18	145	0.10	40.0	*A*	56	24	236	0.16	40.0	*A*	183.06	3	186	0.12	40.0	*A*	271	1	272	0.18	39.9	*A*
398	1,102	0.69	39.6	*C*	473	247	672	0.42	48.2	*A*	1034	474	1,178	0.74	37.2	*C*	376	150	573	0.36	49.1	*A*	954	394	1,098	0.69	39.7	*C*	1,600	309	83	508	0.32	49.4	*A*	752	192	896	0.56	44.8	*B*	458.4	9	467	0.29	49.6	*A*	882	12	894	0.56	44.9	*B*
148	713	0.45	47.8	*A*	1034	474	830	0.52	46.1	*B*	473	247	812	0.51	46.4	*B*	954	394	750	0.47	47.3	*A*	376	150	713	0.45	47.8	*A*	1,600	752	192	548	0.34	49.2	*A*	309	83	648	0.41	48.5	*A*	603.2	12	615	0.38	48.7	*A*	570	9	579	0.36	49.0	*A*
84	214	0.14	40.0	*A*	185	69	214	0.14	40.0	*A*	195	81	211	0.14	40.0	*A*	181	65	207	0.14	40.0	*A*	199	85	214	0.14	40.0	*A*	1,500	144	28	173	0.12	40.0	*A*	138	24	154	0.10	40.0	*A*	186.3	3	189	0.13	40.0	*A*	193	1	194	0.13	40.0	*A*
111	675	0.42	48.2	*A*	770	340	1,468	0.92	27.3	*E*	490	109	673	0.42	48.2	*A*	787	357	1,468	0.92	27.3	*E*	481	100	664	0.42	48.3	*A*	3,200	806	376	1,733	0.54	45.4	*B*	482	101	665	0.21	49.9	*A*	880.8	34	915	0.57	44.4	*B*	405	109	514	0.32	49.4	*A*
73	524	0.41	47.8	*A*	723	103	464	0.36	48.6	*A*	680	60	511	0.40	48.0	*A*	739	119	480	0.38	48.4	*A*	687	67	518	0.40	47.9	*A*	1,280	914	294	655	0.51	45.0	*A*	859	239	690	0.54	43.9	*A*	556.6	10	567	0.44	47.1	*A*	576	11	587	0.46	46.6	*A*
78	349	0.22	49.9	*A*	140	0	472	0.30	49.6	*A*	68	13	284	0.18	49.9	*A*	176	11	483	0.30	49.5	*A*	129	74	345	0.22	49.9	*A*	1,600	165	0	472	0.30	49.6	*A*	164	109	380	0.24	49.8	*A*	441	0	441	0.28	49.7	*A*	314	0	314	0.20	49.9	*A*
15	215	0.18	39.9	*A*	200	43	310	0.26	39.7	*A*	176	25	225	0.19	39.9	*A*	164	7	271	0.23	39.8	*A*	174	23	215	0.18	39.9	*A*	1,200	278	121	388	0.32	39.4	*A*	263	112	312	0.26	39.7	*A*	243.9	8	252	0.21	39.9	*A*	194	6	200	0.17	40.0	*A*
255	605	0.86	10.4	*D*	1027	33	732	1.05	6.1	*F*	834	242	592	0.85	11.0	*D*	1039	45	732	1.05	6.1	*F*	844	252	605	0.86	10.4	*D*	700	997	3	722	1.03	6.4	*F*	754	162	512	0.73	14.9	*C*	658.8	23	682	0.97	7.6	*F*	545	45	590	0.84	11.1	*D*
644	1,452	0.91	16.6	*E*	1161	801	1,623	1.01	12.5	*F*	973	643	1,451	0.91	16.6	*E*	1159	799	1,621	1.01	12.5	*F*	973	643	1,451	0.91	16.6	*E*	1,600	1107	747	1,620	1.01	12.6	*F*	954	624	1,451	0.91	16.6	*E*	1301.6	118	1,420	0.89	17.5	*D*	1,162	86	1,248	0.78	22.6	*C*
22	410	0.32	49.2	*A*	245	14	353	0.28	49.5	*A*	247	18	406	0.32	49.2	*A*	247	16	355	0.28	49.5	*A*	254	25	410	0.32	49.2	*A*	1,792	272	41	380	0.21	49.8	*A*	289	60	448	0.25	49.7	*A*	284	112	396	0.31	49.3	*A*	328	82	410	0.32	49.2	*A*
25	109	0.09	50.0	*A*	110	28	206	0.16	49.9	*A*	75	28	109	0.09	50.0	*A*	113	31	208	0.16	49.9	*A*	74	27	109	0.09	50.0	*A*	1,280	104	22	200	0.16	50.0	*A*	62	15	99	0.08	50.0	*A*	228.8	16	245	0.19	49.9	*A*	120	19	139	0.11	50.0	*A*
30	339	0.42	37.5	*A*	102	36	246	0.31	39.3	*A*	150	49	339	0.42	37.5	*A*	102	36	246	0.31	39.3	*A*	137	36	339	0.42	37.5	*A*	800	111	45	255	0.32	39.2	*A*	125	24	333	0.42	37.7	*A*	253	2	255	0.32	39.2	*A*	339	2	341	0.43	37.4	*A*
109	417	0.35	39.1	*A*	131	50	431	0.36	39.0	*A*	227	117	417	0.35	39.1	*A*	128	47	431	0.36	39.0	*A*	221	111	417	0.35	39.1	*A*	1,200	98	17	405	0.34	39.2	*A*	160	50	358	0.30	39.5	*A*	517.2	3	520	0.43	38.0	*A*	500	6	506	0.42	38.2	*A*
139	412	0.37	32.1	*A*	193	135	312	0.28	32.7	*A*	222	167	440	0.39	31.8	*A*	182	124	301	0.27	32.7	*A*	182	127	400	0.36	32.2	*A*	1,120	359	301	478	0.43	31.4	*A*	172	117	390	0.35	32.3	*A*	312	0	312	0.28	32.7	*A*	412	0	412	0.37	32.1	*A*
26	712	0.56	43.2	*A*	652	35	674	0.53	44.4	*A*	554	10	696	0.54	43.8	*A*	676	59	695	0.54	43.8	*A*	564	20	706	0.55	43.4	*A*	1,792	687	70	709	0.40	48.1	*A*	568	24	710	0.40	48.1	*A*	625.5	91	717	0.56	43.1	*A*	641	48	689	0.54	44.0	*A*
75	444	0.35	48.8	*A*	14	0	235	0.18	49.9	*A*	123	0	365	0.29	49.5	*A*	79	28	237	0.19	49.9	*A*	225	59	428	0.33	49.0	*A*	1,280	77	26	238	0.19	49.9	*A*	214	48	417	0.33	49.1	*A*	213.3	0	213	0.17	49.9	*A*	400	0	400	0.31	49.2	*A*
85	937	0.78	25.7	*C*	150	0	530	0.44	37.8	*A*	385	0	935	0.78	25.8	*C*	269	76	531	0.44	37.8	*A*	495	86	937	0.78	25.7	*C*	1,200	332	139	597	0.50	36.6	*B*	514	105	957	0.80	24.9	*D*	477.9	6	484	0.40	38.5	*A*	843	3	846	0.71	29.2	*C*
685	1,215	1.01	15.5	*F*	998	364	1,453	1.21	9.5	*F*	1373	347	877	0.73	28.0	*C*	1327	693	1,780	1.48	4.8	*F*	1711	685	1,215	1.01	15.5	*F*	2,400	964	330	1,419	0.59	33.8	*B*	1461	435	965	0.40	38.5	*A*	1602	8	1,610	1.34	6.8	*F*	1,094	47	1,141	0.95	18.0	*E*
340	806	0.67	30.6	*C*	1021	421	1,048	0.87	21.4	*D*	779	283	749	0.62	32.6	*B*	1179	579	1,206	1.01	15.8	*F*	824	328	794	0.66	31.1	*B*	2,400	1060	460	1,087	0.45	37.6	*A*	819	323	789	0.33	39.3	*A*	1091.7	0	1,092	0.91	19.7	*E*	725	0	725	0.60	33.3	*B*
270	590	0.37	48.9	*A*	412	204	506	0.32	49.4	*A*	597	227	547	0.34	49.2	*A*	421	213	510	0.32	49.4	*A*	637	267	587	0.37	49.0	*A*	1,600	396	188	490	0.31	49.5	*A*	592	222	542	0.34	49.2	*A*	561	35	596	0.37	48.9	*A*	649	16	665	0.42	48.3	*A*
273	869	0.72	28.3	*C*	1769	949	2,061	1.72	2.8	*F*	796	274	869	0.72	28.3	*C*	1549	729	2,061	1.72	2.8	*F*	782	260	856	0.71	28.8	*C*	2,400	1200	380	1,776	0.74	27.6	*C*	748	226	822	0.34	39.2	*A*	1854.9	24	1,879	1.57	4.0	*F*	782	29	811	0.68	30.5	*C*
30	151	0.09	50.0	*A*	111	29	254	0.16	50.0	*A*	80	33	154	0.10	50.0	*A*	114	32	256	0.16	50.0	*A*	80	33	151	0.09	50.0	*A*	1,600	104	22	247	0.15	50.0	*A*	69	22	143	0.09	50.0	*A*	281.6	16	298	0.19	49.9	*A*	166	19	185	0.12	50.0	*A*
21	255	0.23	32.9	*A*	727	197	469	0.42	31.5	*A*	709	0	234	0.21	32.9	*A*	767	237	489	0.44	31.3	*A*	745	19	253	0.23	32.9	*A*	1,568	841	311	583	0.37	32.1	*A*	853	127	361	0.23	32.9	*A*	440.1	5	445	0.40	31.8	*A*	230	10	240	0.21	32.9	*A*
159	1,041	0.81	29.2	*C*	1099	264	1,257	0.98	19.9	*E*	607	113	995	0.78	31.3	*C*	1111	276	1,209	0.94	21.8	*E*	644	150	1,032	0.81	29.6	*C*	1,280	723	0	993	0.78	31.4	*C*	411	0	882	0.69	36.6	*B*	1088.1	11	1,099	0.86	26.5	*D*	937	4	941	0.74	33.9	*C*
414	1,062	0.83	28.2	*C*	1591	110	1,258	0.98	19.8	*E*	911	216	864	0.68	37.3	*B*	1838	357	1,391	1.09	15.3	*F*	1100	405	1,053	0.82	28.6	*C*	2,560	1715	234	1,382	0.54	43.9	*A*	1055	360	1,008	0.39	48.1	*A*	1251.9	13	1,265	0.99	19.6	*E*	956	27	983	0.77	31.9	*C*
1,352	2,234	1.75	3.1	*F*	1275	0	1,205	0.94	21.9	*E*	2022	1,172	2,054	1.60	4.2	*F*	1452	0	1,458	1.14	13.3	*F*	2149	1,299	2,181	1.70	3.4	*F*	2,560	1484	0	1,077	0.42	47.6	*A*	2143	1,293	2,175	0.85	27.0	*D*	1210.5	6	1,217	0.95	21.4	*E*	2,011	11	2,022	1.58	4.5	*F*
122	315	0.26	39.7	*A*	109	25	131	0.11	40.0	*A*	213	121	314	0.26	39.7	*A*	103	19	122	0.10	40.0	*A*	205	113	306	0.26	39.7	*A*	1,200	100	16	122	0.10	40.0	*A*	137	45	238	0.20	39.9	*A*	109.8	1	111	0.09	40.0	*A*	284	3	287	0.24	39.8	*A*
36	146	0.12	40.0	*A*	100	47	178	0.15	40.0	*A*	144	46	156	0.13	40.0	*A*	91	38	159	0.13	40.0	*A*	132	34	144	0.12	40.0	*A*	1,200	89	36	167	0.14	40.0	*A*	152	54	164	0.14	40.0	*A*	179.67	4	184	0.15	40.0	*A*	165	3	168	0.14	40.0	*A*
160	967	0.60	43.2	*B*	499	155	712	0.45	47.8	*A*	696	172	967	0.60	43.2	*B*	511	167	718	0.45	47.7	*A*	691	167	967	0.60	43.2	*B*	1,600	531	187	744	0.47	47.4	*A*	727	203	1,010	0.63	42.1	*C*	753.9	174	928	0.58	44.1	*B*	1,015	100	1,115	0.70	39.1	*C*
243	735	0.46	47.5	*A*	401	121	401	0.25	49.8	*A*	759	267	735	0.46	47.5	*A*	408	128	405	0.25	49.8	*A*	748	256	735	0.46	47.5	*A*	1,600	451	171	451	0.28	49.6	*A*	730	238	730	0.46	47.6	*A*	425.25	145	570	0.36	49.1	*A*	772	97	869	0.54	45.4	*B*
300	922	0.58	44.3	*B*	592	86	621	0.39	48.7	*A*	1029	298	920	0.58	44.3	*B*	620	114	649	0.41	48.5	*A*	1031	300	922	0.58	44.3	*B*	3,200	869	363	898	0.28	49.6	*A*	1065	334	956	0.30	49.5	*A*	685.65	158	844	0.53	45.8	*B*	968	109	1,077	0.67	40.3	*C*
147	646	0.62	21.5	*B*	967	52	614	0.59	22.4	*B*	1039	97	596	0.57	22.8	*B*	1010	95	656	0.63	21.3	*B*	1081	139	638	0.61	21.8	*B*	1,040	1042	127	689	0.66	20.3	*C*	1165	223	722	0.69	19.4	*C*	524.8	10	535	0.51	24.1	*B*	517	6	523	0.50	24.4	*B*
30	117	0.07	50.0	*A*	71	29	88	0.06	50.0	*A*	182	21	108	0.07	50.0	*A*	79	37	95	0.06	50.0	*A*	195	34	117	0.07	50.0	*A*	1,600	104	62	121	0.08	50.0	*A*	168	7	94	0.06	50.0	*A*	152	2	154	0.10	50.0	*A*	187	2	189	0.12	50.0	*A*
86	1,064	0.89	20.8	*D*	552	208	800	0.67	30.9	*C*	638	177	1,155	0.96	17.5	*E*	559	215	807	0.67	30.6	*C*	547	86	1,064	0.89	20.8	*D*	1,200	530	186	778	0.65	31.6	*B*	546	85	1,063	0.89	20.8	*D*	730.8	18	749	0.62	32.6	*B*	958	6	964	0.80	24.6	*D*
320	663	0.52	44.7	*A*	490	81	467	0.36	48.6	*A*	747	301	644	0.50	45.3	*A*	471	62	448	0.35	48.8	*A*	779	333	663	0.52	44.7	*A*	1,280	486	77	463	0.36	48.6	*A*	749	303	646	0.50	45.2	*A*	412.2	17	429	0.34	49.0	*A*	597	18	615	0.48	46.0	*A*
678	1,344	1.12	11.9	*F*	769	267	1,517	1.26	8.3	*F*	1024	732	1,398	1.17	10.6	*F*	657	155	1,402	1.17	10.5	*F*	962	670	1,336	1.11	12.1	*F*	1,200	682	180	1,430	1.19	9.9	*F*	787	495	1,161	0.97	17.3	*E*	1261.8	0	1,262	1.05	14.1	*F*	1,210	2	1,212	1.01	15.6	*F*
59	241	0.20	39.9	*A*	197	77	232	0.19	39.9	*A*	213	61	243	0.20	39.9	*A*	183	63	218	0.18	39.9	*A*	210	58	240	0.20	39.9	*A*	1,200	175	55	210	0.18	39.9	*A*	194	42	224	0.19	39.9	*A*	201.6	37	239	0.20	39.9	*A*	217	25	242	0.20	39.9	*A*
77	304	0.25	39.8	*A*	712	489	774	0.65	31.8	*B*	289	80	307	0.26	39.7	*A*	662	439	720	0.60	33.5	*B*	287	78	304	0.25	39.8	*A*	1,200	495	272	557	0.46	37.4	*A*	223	14	241	0.20	39.9	*A*	360	3	363	0.30	39.5	*A*	152	1	153	0.13	40.0	*A*
379	907	0.71	35.4	*C*	356	0	517	0.40	47.9	*A*	790	419	947	0.74	33.6	*C*	350	0	517	0.40	47.9	*A*	735	364	892	0.70	36.1	*B*	1,280	355	0	517	0.40	47.9	*A*	624	253	781	0.61	40.8	*B*	465.3	4	469	0.37	48.6	*A*	816	6	822	0.64	39.1	*B*
63	391	0.24	49.8	*A*	905	149	1,002	0.63	42.4	*C*	349	7	335	0.21	49.9	*A*	1020	264	1,000	0.63	42.4	*C*	416	74	375	0.23	49.8	*A*	3,200	833	77	930	0.29	49.6	*A*	394	52	380	0.12	50.0	*A*	967.5	1	969	0.61	43.2	*B*	352	0	352	0.22	49.9	*A*
79	619	0.48	45.9	*A*	992	183	1,111	0.87	26.0	*D*	512	31	571	0.45	47.0	*A*	1112	303	1,100	0.86	26.5	*D*	586	105	600	0.47	46.3	*A*	2,560	905	96	1,024	0.40	48.0	*A*	489	8	548	0.21	49.8	*A*	1061.1	18	1,079	0.84	27.4	*D*	557	20	577	0.45	46.8	*A*
570	1,109	0.87	26.1	*D*	1063	387	1,048	0.82	28.8	*C*	1060	513	1,052	0.82	28.7	*C*	1140	464	1,000	0.78	31.1	*C*	1121	574	1,000	0.78	31.1	*C*	2,560	1115	439	1,100	0.43	47.4	*A*	1142	595	1,134	0.44	47.0	*A*	982.8	19	1,002	0.78	31.0	*C*	998	7	1,005	0.79	30.9	*C*
405	1,097	0.86	26.6	*D*	1171	124	1,218	0.95	21.4	*E*	1120	292	984	0.77	31.9	*C*	1261	214	1,100	0.86	26.5	*D*	1204	376	1,068	0.83	27.9	*D*	2,560	1437	390	1,484	0.58	42.2	*A*	1458	630	1,322	0.52	44.8	*A*	1143.9	0	1,144	0.89	24.5	*D*	987	0	987	0.77	31.7	*C*
243	575	0.48	37.1	*A*	405	282	621	0.52	36.1	*B*	647	291	623	0.52	36.1	*B*	354	231	559	0.47	37.4	*A*	589	233	565	0.47	37.3	*A*	1,200	349	226	565	0.47	37.3	*A*	500	144	476	0.40	38.6	*A*	503.1	0	503	0.42	38.2	*A*	518	0	518	0.43	38.0	*A*
11	144	0.09	50.0	*A*	208	0	251	0.16	50.0	*A*	108	9	142	0.09	50.0	*A*	208	0	251	0.16	50.0	*A*	105	6	139	0.09	50.0	*A*	1,600	208	0	251	0.16	50.0	*A*	105	6	139	0.09	50.0	*A*	401.6	58	460	0.29	49.6	*A*	230	52	282	0.18	49.9	*A*
0	58	0.06	27.0	*A*	28	0	36	0.03	27.0	*A*	34	0	58	0.06	27.0	*A*	28	0	36	0.03	27.0	*A*	34	0	58	0.06	27.0	*A*	1,040	28	0	36	0.03	27.0	*A*	34	0	58	0.06	27.0	*A*	51.7	21	73	0.07	27.0	*A*	64	12	76	0.07	27.0	*A*
138	314	0.20	49.9	*A*	337	127	320	0.20	49.9	*A*	477	202	314	0.20	49.9	*A*	325	115	313	0.20	49.9	*A*	463	188	314	0.20	49.9	*A*	1,600	324	114	312	0.20	49.9	*A*	440	165	341	0.21	49.9	*A*	512	173	685	0.43	48.1	*A*	502	110	612	0.38	48.8	*A*
12	552	0.74	19.7	*C*	527	53	487	0.65	23.4	*C*	454	0	540	0.72	20.4	*C*	522	48	482	0.64	23.7	*C*	464	10	550	0.73	19.8	*C*	750	505	31	465	0.62	24.6	*B*	486	32	572	0.76	18.6	*C*	426.6	7	434	0.58	26.3	*B*	497	3	500	0.67	22.7	*C*
385	566	0.51	30.0	*B*	255	137	356	0.32	32.5	*A*	361	274	455	0.41	31.7	*A*	386	268	476	0.43	31.4	*A*	463	376	557	0.50	30.2	*B*	1,120	398	280	499	0.45	31.1	*A*	480	393	574	0.51	29.8	*B*	523.6	12	536	0.48	30.5	*B*	623	14	637	0.57	28.4	*B*
17	192	0.15	50.0	*A*	96	0	127	0.10	50.0	*A*	97	16	191	0.15	50.0	*A*	101	0	127	0.10	50.0	*A*	99	18	192	0.15	50.0	*A*	1,280	94	0	127	0.10	50.0	*A*	92	11	186	0.15	50.0	*A*	140.8	5	146	0.11	50.0	*A*	211	1	212	0.17	49.9	*A*
31	148	0.10	40.0	*A*	142	52	196	0.13	40.0	*A*	115	24	141	0.09	40.0	*A*	143	53	197	0.13	40.0	*A*	115	24	141	0.09	40.0	*A*	1,500	148	58	202	0.13	40.0	*A*	117	26	143	0.10	40.0	*A*	277.2	9	286	0.19	39.9	*A*	207	11	218	0.15	40.0	*A*

Exhibit 7.6-2 Traffic Model Data for the PM Peak Hour

Alt 4					Alt 5	Alt 5	Alt 5					Alt 5	Alt 5	Alt 5					Alt 6	Alt 6	Alt 6						Alt 6	Alt 6	Alt 6						Alt 7	Alt 7	Alt 7					Alt 7	Alt 7	Alt 7					Alt 8	Alt 8	Alt 8					Alt 8	Alt 8	Alt 8				
S or W Additive	S or W Vol.	S or W V/C	S or W Speed	S or W LOS	N or E Vol	N or E Additive	N or E Vol.	N or E V/C	N or E Speed	N or E LOS	S or W Vol	S or W Additive	S or W Vol.	S or W V/C	S or W Speed	S or W LOS	N or E Vol	N or E Additive	N or E Vol.	N or E V/C	N or E Speed	N or E LOS	S or W Vol	S or W Additive	S or W Vol.	S or W V/C	S or W Speed	S or W LOS	New Alt 7 Capacity	N or E Vol	N or E Additive	N or E Vol.	N or E V/C	N or E Speed	N or E LOS	raw S or W Vol	S or W Additive	S or W Vol.	S or W V/C	S or W Speed	S or W LOS	N or E Vol	N or E Additive	N or E Vol.	N or E V/C	N or E Speed	N or E LOS	S or W Vol	S or W Additive	S or W Vol.	S or W V/C	S or W Speed	S or W LOS
62	299	0.37	38.4	A	368	73	368	0.46	36.6	A	298	61	299	0.37	38.4	A	373	78	373	0.47	36.4	A	292	55	292	0.37	38.6	A	800	363	68	363	0.45	36.8	A	295	58	295	0.37	38.5	A	568	108	676	0.85	19.4	D	478	177	655	0.82	20.7	D
414	1,067	0.67	45.6	B	1190	375	1,215	0.76	40.9	C	1279	490	1,143	0.71	43.3	B	1082	267	1,107	0.69	44.4	B	1188	399	1,052	0.66	46.1	B	1,600	1055	240	1,080	0.68	45.3	B	1173	384	1,037	0.65	46.5	B	1074	73	1,147	0.72	43.2	B	1,067	68	1,135	0.71	43.6	B
346	1,108	0.69	44.4	B	1080	292	1,133	0.71	43.6	B	1241	414	1,176	0.74	42.2	C	974	186	1,027	0.64	46.8	B	1168	341	1,103	0.69	44.6	B	1,600	952	164	1,005	0.63	47.4	A	1155	328	1,090	0.68	45.0	B	997	70	1,067	0.67	45.6	B	1,108	62	1,170	0.73	42.4	C
333	1,023	1.28	13.6	E	1165	296	924	1.16	18.0	D	1190	455	1,145	1.43	9.6	F	1052	183	811	1.01	24.3	C	1051	316	1,006	1.26	14.3	E	800	817	0	628	0.79	36.2	A	875	140	830	1.04	23.2	C	843.7	14	858	1.07	21.5	D	1,125	61	1,186	1.48	8.6	F
500	1,235	1.76	3.1	F	1447	516	1,411	2.02	1.9	F	1351	606	1,341	1.92	2.3	F	1310	379	1,274	1.82	2.8	F	1230	485	1,220	1.74	3.2	F	980	1059	128	1,023	1.04	15.5	C	1001	256	991	1.01	16.6	C	1346.4	14	1,360	1.94	2.2	F	1,359	61	1,420	2.03	1.9	F
176	1,097	0.86	26.6	D	839	220	1,743	1.36	7.6	F	1168	195	1,116	0.87	25.7	D	820	201	1,724	1.35	7.9	F	1159	186	1,107	0.86	26.1	D	2,560	1262	643	2,166	0.85	27.2	D	1909	936	1,857	0.73	34.4	C	1887.6	20	1,908	1.49	5.5	F	1,207	11	1,218	0.95	21.4	E
204	1,326	1.89	2.2	F	897	207	1,255	1.79	2.6	F	934	235	1,357	1.94	2.0	F	884	194	1,242	1.77	2.7	F	915	216	1,338	1.91	2.1	F	700	741	51	1,099	1.57	4.2	F	769	70	1,192	1.70	3.2	F	1372.8	52	1,425	2.04	1.7	F	1,459	19	1,478	2.11	1.4	F
301	1,114	0.33	59.3	B	3038	1,036	3,979	1.19	19.7	F	1518	311	1,124	0.34	59.2	B	3004	1,002	3,945	1.18	20.2	F	1486	279	1,092	0.33	59.3	B	3,330	2991	989	3,932	1.18	20.4	F	1488	281	1,094	0.33	59.3	B	1742.5	537	2,280	0.68	49.2	C	557	423	980	0.29	59.6	B
288	1,633	0.49	56.7	B	2931	838	2,931	0.88	37.5	E	1639	294	1,639	0.49	56.7	B	2878	785	2,878	0.86	38.5	E	1613	268	1,613	0.48	56.9	B	3,330	2850	757	2,850	0.86	39.0	E	1619	274	1,619	0.49	56.8	B	1338.5	626	1,965	0.59	53.5	B	817	437	1,254	0.38	58.8	B
142	895	0.56	44.8	B	1692	405	1,502	0.94	26.2	E	914	144	897	0.56	44.8	B	1692	405	1,502	0.94	26.2	E	914	144	897	0.56	44.8	B	3,200	1692	405	1,502	0.47	47.3	A	914	144	897	0.28	49.6	A	754	281	1,035	0.65	41.5	C	448	209	657	0.41	48.4	A
250	1,048	0.70	31.0	C	1702	448	1,702	1.13	13.2	F	1025	227	1,025	0.68	31.6	C	1740	486	1,740	1.16	12.4	F	1029	231	1,029	0.69	31.5	C	1,500	1766	512	1,766	1.18	11.9	F	1038	240	1,038	0.69	31.2	C	2004.5	120	2,124	1.42	6.8	F	1,205	98	1,303	0.87	23.6	D
79	219	0.14	50.0	A	251	105	251	0.16	50.0	A	239	99	239	0.15	50.0	A	222	76	222	0.14	50.0	A	239	99	239	0.15	50.0	A	1,600	209	63	209	0.13	50.0	A	210	70	210	0.13	50.0	A	322	31	353	0.22	49.9	A	307	40	347	0.22	49.9	A
137	384	0.24	49.8	A	233	151	233	0.15	50.0	A	387	140	387	0.24	49.8	A	201	119	201	0.13	50.0	A	389	142	389	0.24	49.8	A	1,600	147	65	147	0.09	50.0	A	338	91	338	0.21	49.9	A	274.4	17	291	0.18	49.9	A	538	17	555	0.35	49.2	A
94	578	0.36	49.0	A	740	247	740	0.46	47.5	A	591	107	591	0.37	48.9	A	714	221	714	0.45	47.8	A	582	98	582	0.36	49.0	A	1,600	484	0	493	0.31	49.5	A	505	21	505	0.32	49.4	A	999.6	28	1,026	0.64	41.7	C	809	25	834	0.52	46.0	B
26	944	0.63	33.6	C	468	229	906	0.60	34.4	B	150	114	1,032	0.69	31.4	C	412	173	850	0.57	35.5	B	56	20	938	0.63	33.7	C	1,500	463	224	901	0.60	34.5	B	59	23	941	0.63	33.6	C	897	2	899	0.60	34.6	B	1,086	3	1,089	0.73	29.9	C
169	1,458	0.91	27.6	E	886	229	764	0.48	47.1	A	1272	210	1,499	0.94	26.3	E	886	229	764	0.48	47.1	A	1282	220	1,509	0.94	25.9	E	2,240	801	144	679	0.30	49.5	A	1141	79	1,368	0.61	43.0	C	921.6	24	1,774	1.11	18.0	F	1,750	3	946	0.59	43.7	B
117	648	0.41	48.5	A	574	92	902	0.56	44.7	B	633	97	628	0.39	48.6	A	553	71	881	0.55	45.1	B	629	93	624	0.39	48.7	A	1,600	592	110	920	0.58	44.3	B	618	82	613	0.38	48.8	A	810	169	979	0.61	42.9	C	648	155	803	0.50	46.5	B
275	1,389	0.43	48.0	A	1810	431	1,656	0.52	46.1	B	1296	275	1,389	0.43	48.0	A	1805	426	1,651	0.52	46.2	B	1296	275	1,389	0.43	48.0	A	3,200	1805	426	1,651	0.52	46.2	B	1296	275	1,389	0.43	48.0	A	2147.6	593	2,741	0.86	30.6	E	1,806	435	2,241	0.70	39.0	C
194	750	0.47	47.3	A	1453	485	1,507	0.94	26.0	E	939	198	754	0.47	47.3	A	1403	435	1,457	0.91	27.7	E	915	174	730	0.46	47.6	A	1,600	1375	407	1,429	0.89	28.6	E	922	181	737	0.46	47.5	A	1247	390	1,023	0.64	41.8	C	750	273	1,627	1.02	22.2	F
194	649	0.41	48.5	A	1453	485	1,254	0.78	34.7	D	939	198	653	0.41	48.4	A	1403	435	1,204	0.75	36.3	C	915	174	629	0.39	48.6	A	1,600	1375	407	1,176	0.74	37.2	C	922	181	636	0.40	48.6	A	1292.2	390	1,234	0.77	35.3	C	844	273	1,682	1.05	20.5	F
149	217	0.27	39.6	A	155	87	155	0.19	39.9	A	227	159	227	0.28	39.5	A	151	83	151	0.19	39.9	A	226	158	228	0.28	39.5	A	800	139	71	139	0.17	39.9	A	197	129	197	0.25	39.7	A	120	20	140	0.18	39.9	A	174	16	190	0.24	39.7	A
0	88	0.11	40.0	A	97	15	97	0.12	40.0	A	86	0	88	0.11	40.0	A	97	15	97	0.12	40.0	A	86	0	99	0.12	40.0	A	800	97	15	97	0.12	40.0	A	86	0	99	0.12	40.0	A	105.6	49	155	0.19	39.9	A	106	32	138	0.17	39.9	A

APPENDIX 7.7 NOISE

7.7 NOISE

FUNDAMENTALS OF COMMUNITY NOISE

HOW SOUND IS MEASURED

Noise is often described as unwanted sound, and thus is a subjective reaction to the physical phenomenon of sound. **Sound** is variations in air pressure that the ear can detect.

The ear responds to pressure changes over a range of 10^{14} to 1. This is roughly equivalent to the range of one second as compared to 3.2 million years, or one square yard compared to the entire surface area of the earth. To deal with the extreme range of pressures which the ear can detect, researchers express the amount of acoustical energy of a sound by comparing the measured sound pressure to a reference pressure, then taking the logarithm (base ten) of the square of that number. This original unit of sound measurement, named the **bel** after Alexander Graham Bell, corresponded well to human hearing characteristics if it was divided by a factor of ten. The resulting unit, one tenth of a bel, is called the **decibel**, and is abbreviated as **dB**.

The threshold of hearing is considered to be zero dB, and the range of sounds in normal human experience is zero to 140 dB.

Because sound pressure levels are defined as logarithmic numbers, the values cannot be directly added or subtracted. For example, two sound sources, each producing 50 dB, will produce 53 dB when combined, not 100 dB. This is because two sources have two times the energy of one source, and 10 times the logarithm of two equals three. Similarly, ten sources produce a 10 dB higher sound pressure level than one source, as ten times the logarithm of 10 equals 10.

The ear responds to pressure variations in the air from about 20 times per second to about 20,000 times per second. The frequency of the variations is described in terms of **hertz (Hz)**, formerly called cycles per second. The ear does not respond equally to all frequencies. For example, we do not hear very low frequency sounds as well as we hear higher frequency sounds, nor do we hear very high frequency sounds very well. This difference in perceived loudness varies with the sound pressure level of the sound. In general, the maximum sensitivity of the ear occurs at frequencies between about 500 and 8000 Hz.

To compensate for the fact that the ear is not as sensitive at some frequencies and sound pressure levels as at others, a number of frequency weighting scales have been developed. The **"A" weighting** scale is most commonly used for environmental noise assessment, as sound pressure levels measured using an A-weighting filter correlate well with community response to noise sources such as aircraft and traffic.

When an A-weighting filter is used to measure sound pressure levels, the results may be expressed as *sound levels*, in decibels (dB). It is sufficient to use the abbreviation "dB" if these terms are well defined, but many people prefer to use the expressions **dBA** or **dB(A)** for clarity. For convenience, many people

use the term "noise level" interchangeably with "sound level." Table A-1 shows typical sound levels and relative loudness for various types of noise environments.

The **ambient noise level** is defined as the noise from all sources near and far. A similar term is **background noise level**. This term usually refers the ambient noise level that is present before a noise source being studied is introduced. A synonymous term is **pre-project noise level**.

Noise exposure contours or **noise contours** are lines drawn about a noise source representing constant levels of noise exposure. CNEL or L_{dn} (DNL) contours are frequently utilized to graphically portray community noise exposure. The terms CNEL and L_{dn} (DNL) are defined in the following section.

ENVIRONMENTAL NOISE DESCRIPTORS

Most environmental noise sources produce varying amounts of noise over time, so the measured sound levels also vary. For example, noise produced during an aircraft overflight will vary from relatively quiet background levels before the overflight to a maximum value when the aircraft passes overhead, then returning down to background levels as the aircraft leaves the observer's vicinity. Similarly, noise from traffic varies with the number and types of vehicles, speed and proximity to the observer.

Variations in sound levels may be addressed by statistical methods. The simplest of these are the **maximum (L_{max})** and **minimum (L_{min})** noise levels, which are the highest and lowest levels observed. To describe less extreme variations in sound levels, other statistical descriptors may be used, such as the **L_{10}** and **L_{50}** and **L_{90}**. The L_{10} is the A-weighted sound level equaled or exceeded during ten percent of a time period. Similarly, the L_{50} and L_{90} are the sound levels equaled or exceeded during 50 and 90 percent of a time period. The most common time period used with these statistical descriptors is one hour, although any time period could be used so long as it is stated.

Because statistical descriptors such as L_{10}, L_{50}, etc. are cumbersome to use, the **equivalent sound level (L_{eq})** or **energy average sound level** is often used to describe the “average” sound level during stated time period, usually one hour.

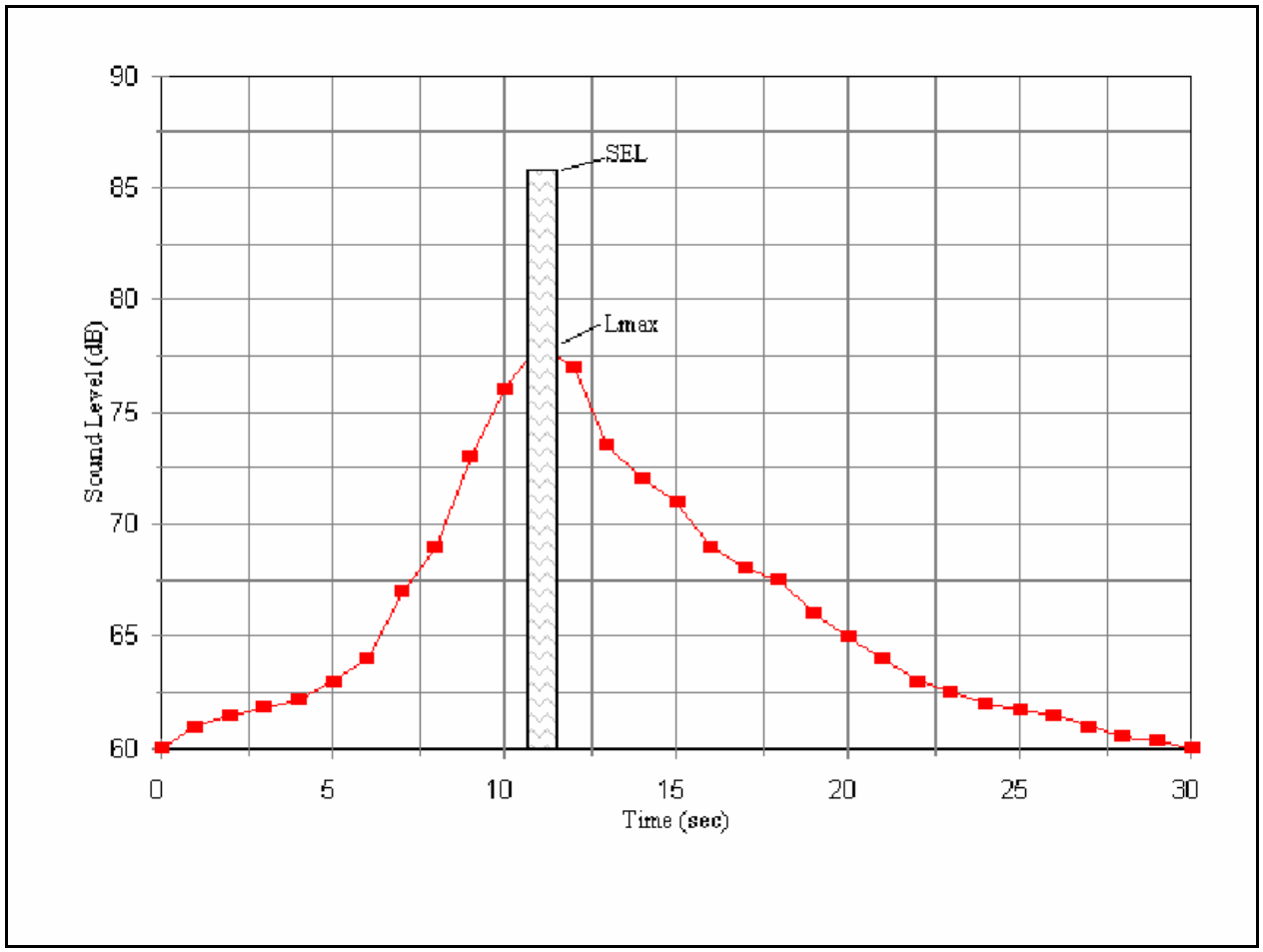
Exhibit 7.7-1
Examples of A-Weighted Sound Levels and Relative Loudness

Sound	*Sound Level (dBA)*	*Relative Loudness (approximate)*	*Relative Sound Energy*
Jet aircraft, 100 feet	130	128	10,000,000
Rock music with amplifier	120	64	1,000,000
Thunder, snowmobile (operator)	110	32	100,000
Boiler shop, power mower	100	16	10,000
Orchestral crescendo at 25 feet, noisy kitchen	90	8	1,000
Busy street	80	4	100
Interior of department store	70	2	10
Ordinary conversation, 3 feet away	60	1	1
Quiet automobile at low speed	50	½	.1
Average office	40	1/4	.01
City residence	30	1/8	.001
Quiet country residence	20	1/16	.0001
Rustle of leaves	10	1/32	.00001
Threshold of hearing	0	1/64	.000001

Source: U.S. Department of Housing and Urban Development, "Aircraft Noise Impact -- Planning Guidelines for Local Agencies," 1972.

For noise sources consisting of more or less discrete single noise events, such as aircraft overflights or train passbys, the exposure received during a noise event is expressed as the **Sound Exposure Level (SEL)**. The SEL represents the total amount of acoustical energy measured during a noise event as though it occurred in a one second period. The SEL incorporates the concept of "How loud was it?" with "How long was it loud?". **Exhibit 7.7-2** shows the relationship of SEL and L_{max} as applied to an aircraft noise event. The SEL is higher than the L_{max} occurring during the event because the SEL compresses the acoustical energy of the event into a reference period of one second, although the assumed duration of the event is 30 seconds in this example.

Exhibit 7.7-2
Typical Aircraft Noise Event



Finally, because people react not only to their perception of individual noise events but also to how many events there are and what time of day or night they occur, composite noise metrics have been developed to describe potential public reaction to long-term exposure to noise events. The two such common descriptors in the United States today are the **Day-Night Average Sound Level (L_{dn} or DNL)**, and the **Community Noise Equivalent Level (CNEL)**. The L_{dn} and CNEL include the concepts of "How loud was it?", "How long was it loud?", and "When was it loud?".

One formula for calculating the L_{dn} is:

$$L_{dn} = 10 \text{ Log } 1/24 \left[15x10^{(Ld/10)} + 9x10^{(Ln+10)/10}\right]$$

where L_d is the average L_{eq} for the 15 daytime hours (i.e., 7 a.m.-10 p.m.), and L_n is the average L_{eq} for the nine nighttime hours (i.e., 10 p.m.-7 a.m.).

The CNEL may be calculated using the following formula:

$$CNEL = 10 \text{ Log } 1/24 \left[12x10^{(Ld/10)} + 3x10^{(Le+4.77)/10} + 9x10^{(Ln+10)/10}\right]$$

where L_e is the average L_{eq} for the three evening hours (i.e., 7 p.m.-10 p.m.). It is apparent that the L_{dn} and CNEL are very similar, differing only because the CNEL penalizes noise occurring in the evening hours by adding 4.77 dB to these values. As a practical matter, the L_{dn} and CNEL are almost equivalent, usually differing by less than one dB.

EFFECTS OF NOISE ON PEOPLE:

The most significant effects of noise on people are annoyance, sleep disturbance and long-term health impacts.

Annoyance

Public reaction to transportation noise was originally studied in 1978, and reexamined in 1992. The so-called Schultz curve was derived from those studies. The Schultz curve, as shown in **Exhibit 7.7-3**, expresses the percentage of the population which is "highly annoyed" by exposure to increasing L_{dn} or CNEL values. The number of persons "highly annoyed" represents 25-30 percent of all persons who are annoyed to some degree by noise.

Sleep Disturbance

Sleep disturbance is best correlated with single event noise descriptors such as the Sound Exposure Level (SEL). Cumulative descriptors of noise, such as the L_{dn} or CNEL, are useful for predicting annoyance in a community, but they do not adequately characterize the brief noise intrusions that usually disturb sleep. Finegold et al. in 1992 developed an interior dose-response to predict the percent of the exposed population expected to be awakened by single event noise exposure. The Finegold curve is shown in **Exhibit 7.7-4**.

Exhibit 7.7-3 Percentage of Population Highly Annoyed by Noise Exposure

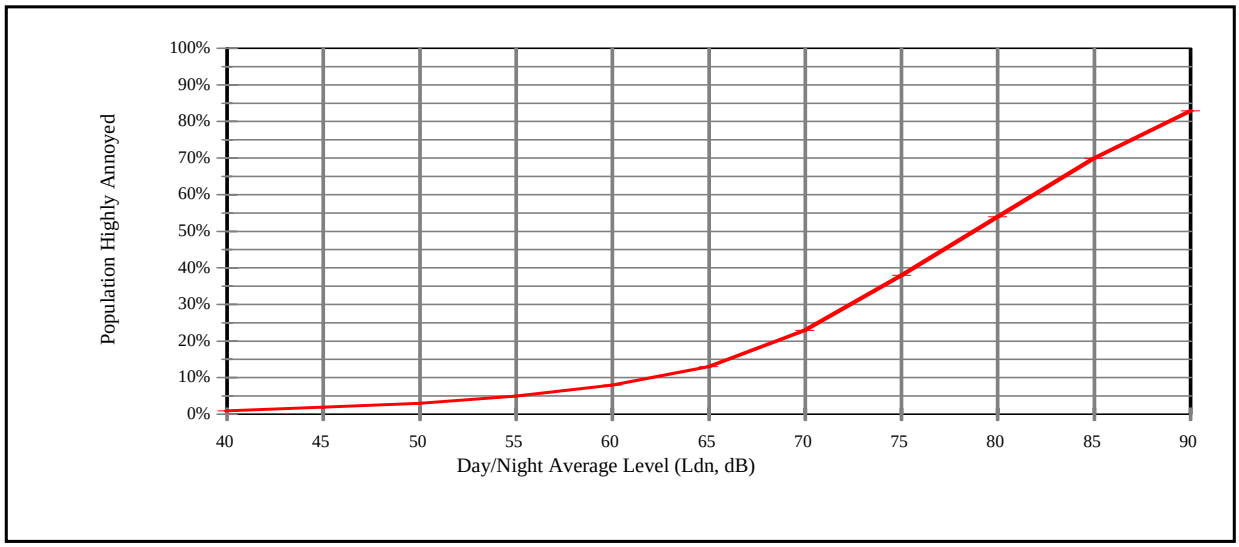
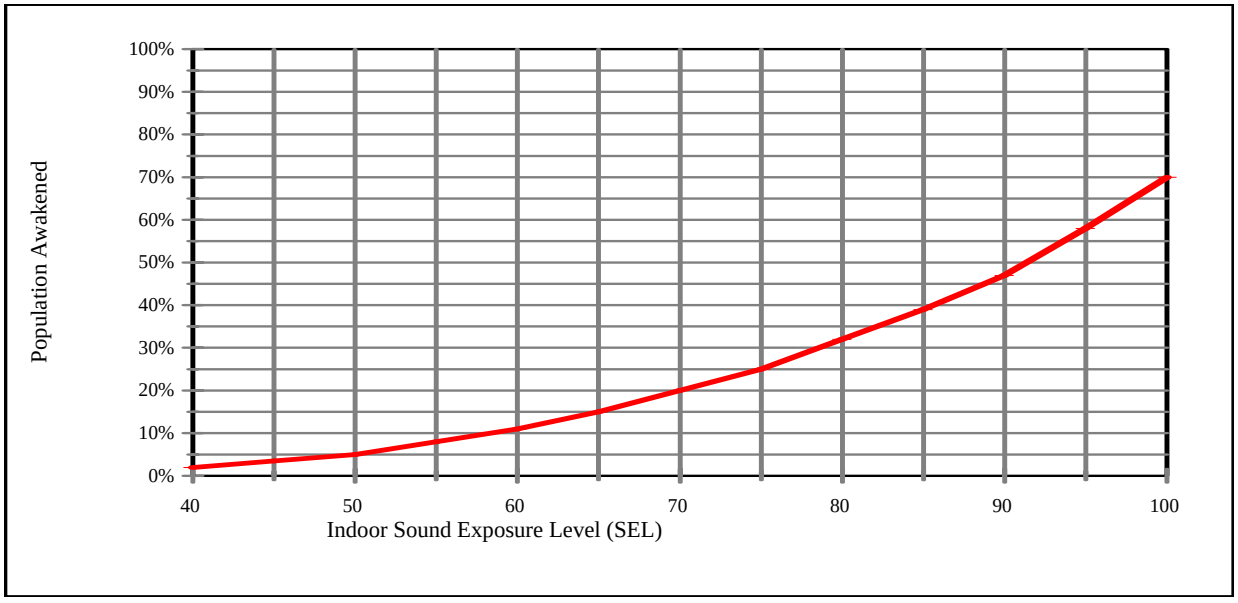


Exhibit 7.7-4 Population Awakened by Indoor Sound Exposure Levels



Long-Term Health Impacts

The National Research Council on Hearing, Bioacoustics and Biomechanics (CHABA) prepared occupational noise exposure guidelines in 1968. Those guidelines indicate that a long-term average noise exposure of less than 75 dB L_{dn} would be required to protect hearing. The Federal Occupational Safety and Health Administration (OSHA) enforces an occupational noise exposure standard of 90 dBA over an eight hour period, or an average of 85 dBA over a 24-hour period. The U.S. Environmental Protection Agency (EPA), to ensure that no measurable hearing loss would be expected over a 40-year working life, recommends an L_{dn} of 75 dB or less over a 24-hour period. The EPA's recommended level of 55 dB L_{dn} is also intended to protect against non-auditory health effects such as hypertension, cardiovascular disease and nervous disorders. It should be noted that the EPA does not consider this recommendation to be a standard since the recommended level does not take into account cost or technical feasibility, and it includes a five dB margin of safety.

Exhibit 7.7-5
Distances To Existing Ldn Traffic Noise Contours, Sonoma State Highways

Roadway Name	Segment Description	Distance to 60 dB L_{dn}, feet	Distance to 65 dB L_{dn}, feet
SR 1	Sonoma County Petaluma Valley Ford Road	54	25
SR 1	Valley Ford/Freestone Roads	52	24
SR 1	Bodega Highway	52	24
SR 1	Eastshore Road	65	30
SR 1	Jct. Rte. 116 East	39	18
SR 1	Jenner	23	11
SR 1	Fort Ross, Fort Ross Road	22	10
SR 1	Stewarts Point/Skaggs Springs Road	25	12
SR 12	Sebastopol, Jct. Rte. 116, Main Street	189	88
SR 12	Sebastopol East City Limits	273	127
SR 12	Santa Rosa, Wright/Fulton Roads	400	186
SR 12	Santa Rosa, Stony Point Road	581	270
SR 12	Santa Rosa, Dutton Avenue	642	298
SR 12	Santa Rosa, Jct. Rte. 101	662	307
SR 12	Santa Rosa, Bennett Valley Road	488	226
SR 12	Santa Rosa, Brookwood/ Maple Avenues	560	260
SR 12	Santa Rosa, Farmers Lane, West Junction	441	205
SR 12	Santa Rosa, Brush Creek Road	429	199
SR 12	Santa Rosa, Farmers Lane, East Junction	461	214
SR 12	Santa Rosa, Middle Rincon Road	445	207
SR 12	Santa Rosa, Calistoga Road	362	168
SR 12	Santa Rosa, Los Alamos Road	324	150
SR 12	Adobe Canyon Road	281	131
SR 12	Kenwood, Warm Springs Road	266	123
SR 12	Trinity Road	270	125
SR 12	Arnold Drive	252	117
SR 12	Madrone Road	207	96
SR 12	Cavedale Road	151	70
SR 12	Agua Caliente Road	131	61
SR 12	Boyes Boulevard	113	52
SR 12	Verano Avenue	119	55
SR 12	Sonoma, Petaluma Avenue	122	57
SR 12	Sonoma, Fifth Street West	102	47
SR 12	Sonoma, First Street West	96	44
SR 12	Sonoma, Patten Street	81	37
SR 12	Sonoma, Mac Arthur Street	129	60
SR 12	Napa/Leveroni Roads	107	50
SR 12	Watmaugh Road	149	69

Roadway Name	***Segment Description***	***Distance to 60 dB L_{dn}, feet***	***Distance to 65 dB L_{dn}, feet***
SR 37	Sonoma County Lakeville Road	860	399
SR 37	Jct. Rte. 121 North	686	318
SR 101	Sonoma County Kastania Road	1627	755
SR 101	South Petaluma Boulevard	1566	727
SR 101	Petaluma, South Jct. Rte. 116 East	1686	783
SR 101	Petaluma, East Washington Street	1674	777
SR 101	Petaluma, Old Redwood Highway North	1780	826
SR 101	Pepper Road	1745	810
SR 101	Railroad Avenue	1609	747
SR 101	Cotati, Sierra Avenue	1555	722
SR 101	Cotati, North Jct. Rte. 116	1609	747
SR 101	Rohnert Park, Rohnert Park Expressway	1663	772
SR 101	Rohnert Park, Wilfred Avenue	1860	863
SR 101	Santa Rosa Avenue	1468	682
SR 101	Todd Road	1468	682
SR 101	Santa Rosa, Hearn Avenue	1526	708
SR 101	Santa Rosa, Baker Avenue	1620	752
SR 101	Santa Rosa, Jct. Rte. 12, Third Street	1488	691
SR 101	Santa Rosa, Fourth Street	1620	752
SR 101	Santa Rosa, College Avenue	1564	726
SR 101	Santa Rosa, Steele Lane	1478	686
SR 101	Santa Rosa, Bicentennial Way	1278	593
SR 101	Santa Rosa, Mendocino Avenue	1299	603
SR 101	Santa Rosa, Hopper Avenue	1370	636
SR 101	East Fulton/River Roads	1529	710
SR 101	Fulton Road	1582	735
SR 101	Airport Boulevard	1516	704
SR 101	Shiloh Road	1321	613
SR 101	Windsor River Road	1078	501
SR 101	Grant Avenue	918	426
SR 101	South Healdsburg	752	349
SR 101	Healdsburg, Westside Road	825	383
SR 101	Healdsburg, Dry Creek Road	701	325
SR 101	Lytton Springs Road	683	317
SR 101	Independence Lane	674	313
SR 101	South Geyserville	608	282
SR 101	Jct. Rte. 128 East, Canyon Road	606	281
SR 101	Asti	604	280
SR 101	Dutcher Creek Road	604	280
SR 101	South Cloverdale	560	260
SR 101	Central Cloverdale/Citrus Fair Drive	487	226
SR 101	Jct. Rte. 128 West	481	223

Roadway Name	***Segment Description***	***Distance to 60 dB L_{dn}, feet***	***Distance to 65 dB L_{dn}, feet***
SR 116	Jct. Rte. 1; Jenner, South	69	32
SR 116	Austin Creek	117	54
SR 116	Monte Rio Road (Town Center)	139	65
SR 116	Guernewood Park, Hulbert Creek Bridge	197	91
SR 116	Guerneville, Armstrong Woods Road	140	65
SR 116	Santa Nella Winery Road	66	31
SR 116	Forestville, Mirabel Road	181	84
SR 116	Guerneville Road	176	81
SR 116	Graton/Frei Roads	224	104
SR 116	Occidental/Molino Roads	225	105
SR 116	Sebastopol, Covert Lane	272	126
SR 116	Sebastopol, on Main Street	251	117
SR 116	Sebastopol, on Petaluma Avenue	179	83
SR 116	Sebastopol, Jct. Rte. 12 East	213	99
SR 116	Sebastopol, Jct. Rte. 12 East	218	101
SR 116	Sebastopol, Petaluma Avenue	323	150
SR 116	Bloomfield Road	244	113
SR 116	Mt. Vernon/lone Pine Roads	246	114
SR 116	Stony Point Road (East)	235	109
SR 116	Petaluma, South Jct. Rte. 101	568	263
SR 116	Frates Road/Cader Lane	476	221
SR 116	Lakeville Road	106	49
SR 116	Adobe Road	391	181
SR 116	Watmaugh Road (To Sonoma)	347	161
SR 116	Arnold Drive	380	176
SR 121	Jct. Rte. 37	369	171
SR 121	Jct. Rte. 116 West, Arnold Drive	435	202
SR 121	Jct. Rte. 12 North; Schellville, West	401	186
SR 121	Schellville, Eighth Street	407	189
SR 121	Ramal Road	373	173
SR 121	Napa Road	558	259
SR 121	Mendocino Sonoma County Line	95	44
SR 121	South Jct. Rte. 101, Canyon Road	98	46
SR 121	Canyon Road/Old Redwood Highway	100	46
SR 121	River Road	73	34
SR 121	Geyersville, Old Redwood Highway	115	53
SR 121	Geysers Road	88	41
SR 121	Alexander Valley Road	152	71
SR 121	Pine Flat Road	138	64
SR 121	Chalk Hill Road	104	48
SR 121	Kellogg, Franz Valley Road	81	38
SR 121	Sonoma County Napa County	107	49

Exhibit 7.7-6
Distances to Existing Ldn Traffic Noise Contours, Sonoma County Roads

Roadway Name	Segment Description	Distance to 60 dB Ldn, feet	Distance to 65 dB Ldn, feet
Adobe Rd	E/Old Redwood Hwy N	76	35
Adobe Rd	W/Petaluma Hill Rd	84	39
Adobe Rd	W/Woodward Ave	171	79
Adobe Rd	E/Woodward Ave	171	79
Adobe Rd	W/ Corona Rd	189	88
Adobe Rd	W/ East Washington Rd	181	84
Adobe Rd	E/ East Washington Rd	190	88
Adobe Rd	E/ Frates Rd	208	96
Agua Caliente Rd	E/Arnold Dr	37	17
Airport Blvd	W/Ordinance Rd	52	24
Airport Blvd	W/Laughlin Rd	60	28
Airport Blvd	E/ Skylane	134	62
Airport Blvd	E/ Brickway	173	80
Airport Blvd	W/ Regional Parkway	145	67
Airport Blvd	E/ Concourse Blvd	143	67
Airport Blvd	E/ RR Tracks	179	83
Airport Blvd	E/ Regional Pkwy	203	94
Airport Blvd	E/ Aviation Blvd	258	120
Airport Blvd	W/ Fulton Rd	140	65
Airport Blvd	E/ Fulton Rd	151	70
Airport Blvd	W/ Faught Rd	87	40
Alexander Valley Rd	W/ Lytton Station Rd	82	38
Armstrong Woods Rd	N/ Hwy 116	40	18
Armstrong Woods Rd	N/ Watson	18	8
Arnold Dr	S/ Watmaugh Rd	201	93
Arnold Dr	N/ Watmaugh Rd	237	110
Arnold Dr	N/ Almeria	254	118
Arnold Dr	N/ Leveroni Rd	219	102
Arnold Dr	S/ Petaluma Ave	195	91
Arnold Dr	N/ Solano Ave	221	103
Arnold Dr	N/ Verano Ave	224	104
Arnold Dr	S/ Agua Caliente Rd	206	96
Arnold Dr	N/ Agua Caliente Rd	178	83
Arnold Dr	N/ Chauvet Rd	87	40
Arnold Dr	S/ London Ranch Rd	89	41
Arnold Dr	S/ Dunbar Rd	64	30
Arnold Dr	S/ Hwy 12	65	30
Aviation Blvd	W/ Airport Ave	76	35

Roadway Name	Segment Description	Distance to 60 dB Ldn, feet	Distance to 65 dB Ldn, feet
Barham Ave	E/ Dutton Ave	49	23
Barham Ave	W/ Olive St	21	10
Barham Ave	E/ Olive St	12	5
Barnes Rd	S/ River Rd	62	29
Bonnet Valley Rd	W/ Grange Rd	113	53
Bennett Valley Rd	E/ Sonoma Mountain Rd	68	32
Bennett Valley Rd	W/ Warm Springs Rd	54	25
Bloomfield Rd	N/ Valley Ford Rd	32	15
Bloomfield Rd	S/ Kennedy Rd	62	29
Bloomfield Rd	S/ Pleasant Hill Rd	55	25
Bloomfield Rd	S/ Hwy 116	111	52
Bodega Ave	W/ King Rd	93	43
Bodega Ave	W/ Thompson Ln	129	60
Bodega Ave	E/ Lohrman Ln	161	75
Bodega Ave	W/ Paula	164	76
Bodega Ave	E/ Paula	158	73
Bodega Hwy	E/ Valley Ford / Freestone Rd	161	75
Bodega Hwy	W/ Bohemian Hwy	152	70
Bodega Hwy	W/ Jonive	107	50
Bodega Hwy	E/ Wagnon Rd	117	54
Bodega Hwy	E/ Grandview Rd	143	66
Bodega Hwy	W/ Watertrough Rd	157	73
Bodega Hwy	E/ Watertrough Rd	177	82
Bohemian Hwy	S/ Hwy 116	86	40
Bohemian Hwy	N/ Freestone Flat Rd	52	24
Bohemian Hwy	S/ Bittner Rd	58	27
Bohemian Hwy	S/ Main St	58	27
Bohemian Hwy	N/ Graton Rd	73	34
Boyes Blvd	W/ Railroad Ave	45	21
Boyes Blvd	E/ Railroad Ave	71	33
Boyes Blvd	E/ Riverside Rd	61	28
Brush Creek Rd	N/ Montecito Ave	88	41
Calistoga Rd	S/ Rincon Ave	75	35
Calistoga Rd	S/ Porter Creek Rd	68	32
Corby Ave	S/ Smokewood Drive	71	33
Corby Ave	S/ Peach St	58	27
Corby Ave	N/ Peach St	53	24
Corona Rd	S/ Adobe Rd	86	40
Crane Canyon Rd	E/ Petaluma Hill Rd	67	31
Crane Canyon Rd	E/ Inverness Ave	46	21
D St	S/ San Antonio Rd	63	29
Dry Creek Rd	N/ Lytton Springs Rd	108	50

Roadway Name	Segment Description	Distance to 60 dB Ldn, feet	Distance to 65 dB Ldn, feet
Dry Creek Rd	N/ Lambert Bridge Rd	78	36
Dutton Ave	N/ Hearn Ave	62	29
Dutton Ave	S/ Barham Ave	77	36
East Cotati Ave	W/ Petaluma Hill Rd	98	45
East Napa St	W/ Seventh St. East	71	33
East Washington St	S/ Adobe Rd	84	39
Eighth St East	N/ Hwy 12 / 121	39	18
Eighth St East	S/ Napa Rd	68	31
Eighth St East	N/ Napa Rd	79	37
Eighth St East	S/ East Napa St	65	30
Ely Rd	E/ Old Redwood Hwy N	56	26
Fifth St West	N/ Leveroni Rd	132	61
Frates Rd	S/ Adobe Rd	100	46
Fulton Rd	S/ River Rd	191	89
Fulton Rd	N/ River Rd	206	96
Grange Rd	S/ Bennett Valley Rd	86	40
Graton Rd	W/ Green Hill Rd	37	17
Graton Rd	W/ Ross Rd	37	17
Graton Rd	W/ Hwy 116	35	16
Green Valley Rd	E/ Hwy 116	6	3
Green Valley Rd	E/ Harrison Grade Rd	11	5
Green Valley Rd	W/ Hwy 116	38	18
Guerneville Rd	E/ Vine Hill Rd	104	48
Guerneville Rd	E/ Frei Rd	123	57
Guerneville Rd	W/ Willowside Rd	211	98
Guerneville Rd	E/ Willowside Rd	259	120
Guerneville Rd	W/ Lance Ave	178	82
Hearn Ave	W/ Dutton Ave	72	34
Hearn Ave	E/ Dutton Ave	138	64
High School Rd	N/ East Hurlbut Ave	69	32
High School Rd	S/ Occidental Rd	71	33
Lakeville Rd	N/ Hwy 37	287	133
Lakeville Rd	N/ Cannon Ln	279	130
Leveroni Rd	E/ Arnold Dr	190	88
Leveroni Rd	E/ Harrington	159	74
Llano Rd	N/ Hwy 116	72	34
Llano Rd	N/ Ludwig Ave	120	56
Lone Pine Rd	W/ Hwy 116	55	25
Ludwig Ave	W/ Stony Pt. Rd	84	39
Madrone Rd	W/ Hwy 12	46	21
Main St	S/ Hwy 12	37	17
Main St	S/ Adobe Rd	77	36

Roadway Name	*Segment Description*	*Distance to 60 dB Ldn, feet*	*Distance to 65 dB Ldn, feet*
Main St	N/ Tyrone Rd	22	10
Mark West Springs Rd	E/ Hwy 101	236	110
Mark West Springs Rd	E/ Ursuline Rd	189	88
Mark West Springs Rd	W/ Mark West Springs Lodge	122	57
Mark West Springs Rd	E/ Michele Way	125	58
Mark West Springs Rd	W/ Porter Creek Rd	134	62
Mark West Springs Rd	E/ Trenton Healdsburg Rd	22	10
Mecham Rd	S/ Dump	50	23
Mecham Rd	N/ Pepper Rd	49	23
Mecham Rd	N/ Refuse Rd	79	36
Mecham Rd	S/ Stony Pt. Rd	74	34
Mill Station Rd	W/ Occidental Rd	33	15
Millbrae Ave	W/ Stony Pt. Rd	35	16
Millbrae Ave	E/ Stony Pt. Rd	101	47
Mirabel Rd	S/ Trenton Rd	128	59
Moorland Ave	N/ Todd Rd	49	23
Mountain View Ave	E/ Santa Rosa Ave	60	28
Mountain View Ave	W/ Hunter Ln	49	23
Mountain View Ave	E/ Hunter Ln	43	20
Napa Rd	W/ Fifth St East	120	56
Napa Rd	E/ Pueblo Ave	125	58
Napa Rd	W/ Eighth St East	125	58
Napa Rd	W/ Hyde Rd	131	61
Napa Rd	E/ Burndale Rd	125	58
Occidental Rd	E/ Mill St	108	50
Occidental Rd	E/ Hwy 116	147	68
Occidental Rd	W/ Sanford Rd	169	78
Occidental Rd	E/ High School Rd	133	62
Occidental Rd	E/ Irwin Ln	139	65
Occidental Rd	E/ Merced	138	64
Old Redwood Hwy	N/ Mendocino	175	81
Old Redwood Hwy	S/ Ursuline	179	83
Old Redwood Hwy	N/ Mark West Springs Rd	218	101
Old Redwood Hwy	S/ Wikiup Dr	191	88
Old Redwood Hwy	N/ Mark West Circle Bridge	196	91
Old Redwood Hwy	N/ Wikiup Dr	175	81
Old Redwood Hwy	N/ Faught Rd	171	79
Old Redwood Hwy	N/ Fulton Rd	165	76
Old Redwood Hwy	N/ Eastside Rd	117	54
Old Redwood Hwy	N/ Ely Rd	239	111
Old Redwood Hwy	N/ Adobe Rd	157	73
Old Redwood Hwy	S/ West Railroad Ave	171	79

Roadway Name	***Segment Description***	***Distance to 60 dB Ldn, feet***	***Distance to 65 dB Ldn, feet***
Old Redwood Hwy	N/ West Railroad Ave	177	82
Old Redwood Hwy	N/ East Railroad Ave	169	78
Olivet Rd	N/ Guerneville Rd	78	36
Olivet Rd	S/ River Rd	71	33
Pepper Rd	E/ Walker Rd	104	49
Pepper Rd	E/ Mecham Rd	74	34
Pepper Rd	W/ Stony Pt. Rd	92	43
Petaluma Ave	E/ Arnold Dr	92	43
Petaluma Blvd N	N/ Skillman Ln	257	119
Petaluma Blvd S	N/ Hwy 101 S/B Off Ramp	221	102
Petaluma Hill Rd	N/ Adobe Rd	280	130
Petaluma Hill Rd	S/ East Railroad Ave	282	131
Petaluma Hill Rd	N/ East Railroad Ave	291	135
Petaluma Hill Rd	N/ Roberts Rd	246	114
Petaluma Hill Rd	N/ East Cotati Ave	268	124
Petaluma Hill Rd	S/ Crane Canyon Rd	265	123
Petaluma Hill Rd	N/ Crane Canyon Rd	190	88
Petaluma Hill Rd	N/ Snyder Ln	306	142
Petrified Forest Rd	W/ Sharp Rd	164	76
Porter Creek Rd	E/ Franz Valley Rd	77	36
Railroad ave	S/ Verano Ave	21	10
Railroad Ave	N/ Verano Ave	76	35
Railroad Ave	S/ Boyes Blvd	48	22
Railroad Ave	N/ Boyes Blvd	28	13
Riel Rd	W/ Wilshire Dr	67	31
River Rd	W/ Orchard Rd	126	59
River Rd	E/ Canyon Two Rd	120	56
River Rd	W/ Mirabel Rd	130	60
River Rd	W/ Trenton_Healdsburg Rd	116	54
River Rd	W/ Fulton Rd	137	64
River Rd	E/ Fulton Rd	133	62
Riverside Dr	N/ Hwy 12	101	47
Riverside Dr	N/ Petaluma Ave	63	29
Riverside Dr	S/ Grove St	47	22
Riverside Dr	N/ Grove St	26	12
Riverside Dr	N/ Verano Ave	36	17
Roblar Rd	W/ Canfield Rd	38	18
Roblar Rd	E/ Canfield Rd	52	24
Roblar Rd	W/ Stony Pt. Rd	82	38
Rohnert Park Exp	E/ Stony Pt. Rd	209	97
Rohnert Park Exp	W/ Petaluma Hill Rd	158	73
Santa Rosa Ave	S/ Horn Ave	147	68

Roadway Name	Segment Description	Distance to 60 dB Ldn, feet	Distance to 65 dB Ldn, feet
Santa Rosa Ave	S/ Mountain View Ave	175	81
Santa Rosa Ave	N/ Mountain View Ave	195	91
Santa Rosa Ave	S/ East Robles Ave	181	84
Santa Rosa Ave	N/ East Robles Ave	160	74
Sebastopol Rd	E/ Stony Pt. Rd	196	91
Sebastopol Rd	E/ West Ave	230	107
Skillman Ln	E/ Bodega Ave	50	23
Skillman Ln	E/ Thompson Ln	77	36
Skillman Ln	W/ Petaluma Blvd	106	49
Skylane Blvd	N/ Airport Blvd	68	31
Snyder Ln	S/ Petaluma Hill Rd	127	59
Standish Ave	N/ Todd Rd	69	32
Stony Point Rd	S/ Pepper Rd	127	59
Stony Point Rd	N/ Pepper Rd	114	53
Stony Point Rd	S/ Mecham Rd	165	76
Stony Point Rd	N/ Mecham Rd	132	61
Stony Point Rd	N/ Roblar Rd	201	93
Stony Point Rd	S/ Madrone	166	77
Stony Point Rd	N/ Hwy 116	144	67
Stony Point Rd	N/ Rohnert Park Exp	127	59
Stony Point Rd	S/ Millbrae Ave	152	71
Stony Point Rd	N/ Millbrae Ave	160	74
Stony Point Rd	N/ Scenic Ave	186	86
Stony Point Rd	S/ Todd Rd	145	67
Stony Point Rd	N/ Todd Rd	172	80
Todd Rd	W/ Llano Rd	59	28
Todd Rd	W/ Stony Pt. Rd	79	37
Todd Rd	E/ Stony Pt. Rd	101	47
Todd Rd	W/ Standish Ave	88	41
Todd Rd	E/ Standish Ave	140	65
Valley Ford Rd	E/ Gericke Rd	85	39
Valley Ford Rd	W/ Tomales Rd	88	41
Verano Ave	E/ Hickory St	51	23
Verano Ave	E/ Linden Ave	62	29
Verano Ave	W/ Railroad Ave	64	30
Verano Ave	W/ Riverside Dr	67	31
Verano Ave	E/ Riverside Dr	75	35
Verano Ave	W/ Hwy 12	77	36
Verano Ave	E/ Lomita Ave	62	29
Vine Hill Rd	S/ Guerneville	92	43
Warm Springs Rd	N/ Henno Rd	51	24
Warm Springs Rd	N/ Sonoma Mt Rd	45	21

Roadway Name	***Segment Description***	***Distance to 60 dB Ldn, feet***	***Distance to 65 dB Ldn, feet***
Warm Springs Rd	S/ Lawndale	19	9
Warm Springs Rd	N/ Bennett Valley Rd	21	10
Warm Springs Rd	N/ Lawndale	27	12
Warm Springs Rd	S/ Hwy 12	28	13
Watertrough Rd	S/ Burnside Rd	66	31
Watertrough Rd	S/ Bodega Hwy	91	42
Watmaugh Rd	W/ Arnold Dr	95	44
Watmaugh Rd	E/ Arnold Dr	71	33
Watmaugh Rd	W/ Hwy 12	66	31
West Ave	N/ Gloria Dr	32	15
West Ave	S/ South Ave	40	18
West Ave	N/ South Ave	44	20
West Ave	S/ Sunset Ave	45	21
West Third St	W/ Dutton Ave	116	54
Westside Rd	N/ Felta Rd	65	30
Westside Rd	S/ Kinley Dr	93	43
Wikiup Dr	E/ Old Redwood Hwy N	46	21

Exhibit 7.7-7
Comparison of Existing and Future Traffic Noise Levels – State Highways and Roadways

Roadway	***Segment***	***Predicted L_{dn}, at 50 Feet from Roadway Centerline***			***Distance to L_{dn} 60 dB Contour, Feet***
		Existing	***Future***	***Future minus Existing***	
SR 1	Sonoma County Petaluma-Valley Ford Road	60.5	62.6	2.1	74
SR 1	Valley Ford / Freestone Roads	60.3	62.4	2.1	72
SR 1	Bodega Highway	60.2	62.3	2.1	71
SR 1	Eastshore Road	61.7	63.8	2.1	89
SR 1	Jct. Rte. 116 East	58.4	60.5	2.1	54
SR 1	Jenner	55.0	57.0	2.1	32
SR 1	Fort Ross, Fort Ross Road	54.8	56.9	2.1	31
SR 1	Stewarts Point/Skaggs Springs Road	55.6	57.7	2.1	35
SR 12	Sebastopol, Jct. Rte. 116, Main Street	68.7	70.1	1.5	237
SR 12	Sebastopol East City Limits	71.1	72.5	1.5	341
SR 12	Santa Rosa, Wright/Fulton Roads	73.6	75.0	1.5	501
SR 12	Santa Rosa, Stony Point Road	76.0	77.4	1.5	728
SR 12	Santa Rosa, Dutton Avenue	76.6	78.1	1.5	804
SR 12	Santa Rosa, Jct. Rte. 101	76.8	78.3	1.5	828
SR 12	Santa Rosa, Bennett Valley Road	74.8	76.3	1.5	610
SR 12	Santa Rosa, Brookwood/ Maple Avenues	75.7	77.2	1.5	701
SR 12	Santa Rosa, Farmers Lane, West Junction	74.2	75.6	1.5	552

Roadway	Segment	Predicted L_{dn}, at 50 Feet from Roadway Centerline			Distance to L_{dn} 60 dB Contour, Feet
		Existing	Future	Future minus Existing	
SR 12	Santa Rosa, Brush Creek Road	74.0	75.5	1.5	537
SR 12	Santa Rosa, Farmers Lane, East Junction	74.5	75.9	1.5	577
SR 12	Santa Rosa, Middle Rincon Road	74.2	75.7	1.5	557
SR 12	Santa Rosa, Calistoga Road	72.9	74.4	1.5	453
SR 12	Santa Rosa, Los Alamos Road	72.2	73.6	1.5	406
SR 12	Adobe Canyon Road	71.3	72.7	1.5	352
SR 12	Kenwood, Warm Springs Road	70.9	72.3	1.5	332
SR 12	Trinity Road	71.0	72.5	1.5	338
SR 12	Arnold Drive	70.5	72.0	1.5	316
SR 12	Madrone Road	69.2	70.1	0.8	235
SR 12	Cavedale Road	67.2	68.0	0.8	172
SR 12	Agua Caliente Road	66.3	67.1	0.8	148
SR 12	Boyes Boulevard	65.3	65.9	0.6	124
SR 12	Verano Avenue	65.7	66.5	0.8	135
SR 12	Sonoma, Petaluma Avenue	65.8	66.6	0.8	138
SR 12	Sonoma, Fifth Street West	64.7	65.4	0.8	115
SR 12	Sonoma, First Street West	64.2	65.0	0.8	108
SR 12	Sonoma, Patten Street	63.1	63.9	0.8	91
SR 12	Sonoma, Mac Arthur Street	66.2	67.0	0.8	146
SR 12	Napa/Leveroni Roads	65.0	65.8	0.8	121
SR 12	Watmaugh Road	67.1	67.9	0.8	169

Roadway	***Segment***	***Predicted L_{dn}, at 50 Feet from Roadway Centerline***			***Distance to L_{dn} 60 dB Contour, Feet***
		Existing	***Future***	***Future minus Existing***	
SR 37	Sonoma County Lakeville Road	78.5	80.3	1.8	1127
SR 37	Jct. Rte. 121 North	77.1	80.0	2.9	1077
SR 101	Sonoma County Kastania Road	82.7	82.4	-0.3	1553
SR 101	South Petaluma Boulevard	82.4	83.0	0.5	1699
SR 101	Petaluma, South Jct. Rte. 116 East	82.9	83.4	0.5	1829
SR 101	Petaluma, East Washington Street	82.9	83.4	0.5	1817
SR 101	Petaluma, Old Redwood Highway North	83.3	83.8	0.5	1931
SR 101	Pepper Road	83.1	83.7	0.5	1893
SR 101	Railroad Avenue	82.6	83.1	0.5	1746
SR 101	Cotati, Sierra Avenue	82.4	82.9	0.5	1687
SR 101	Cotati, North Jct. Rte. 116	82.6	83.1	0.5	1746
SR 101	Rohnert Park, Rohnert Park Expressway	82.8	83.4	0.5	1804
SR 101	Rohnert Park, Wilfred Avenue	83.6	83.9	0.4	1972
SR 101	Santa Rosa Avenue	82.0	82.4	0.4	1555
SR 101	Todd Road	82.0	82.4	0.4	1555
SR 101	Santa Rosa, Hearn Avenue	82.3	82.6	0.4	1616
SR 101	Santa Rosa, Baker Avenue	82.7	83.0	0.4	1715
SR 101	Santa Rosa, Jct. Rte. 12, Third Street	82.1	83.6	1.5	1877
SR 101	Santa Rosa, Fourth Street	82.7	84.2	1.5	2046

Roadway	***Segment***	***Predicted L_{dn}, at 50 Feet from Roadway Centerline***			***Distance to L_{dn} 60 dB Contour, Feet***
		Existing	***Future***	***Future minus Existing***	
SR 101	Santa Rosa, College Avenue	82.4	84.0	1.5	1976
SR 101	Santa Rosa, Steele Lane	82.1	83.6	1.5	1867
SR 101	Santa Rosa, Bicentennial Way	81.1	82.6	1.5	1615
SR 101	Santa Rosa, Mendocino Avenue	81.2	82.7	1.5	1641
SR 101	Santa Rosa, Hopper Avenue	81.6	83.1	1.5	1731
SR 101	East Fulton/River Roads	82.3	84.0	1.7	1990
SR 101	Fulton Road	82.5	84.2	1.7	2055
SR 101	Airport Boulevard	82.2	83.4	1.2	1811
SR 101	Shiloh Road	81.3	82.5	1.2	1581
SR 101	Windsor River Road	80.0	82.1	2.1	1482
SR 101	Grant Avenue	79.0	81.0	2.1	1261
SR 101	South Healdsburg	77.7	79.7	2.1	1032
SR 101	Healdsburg, Westside Road	78.3	80.3	2.1	1133
SR 101	Healdsburg, Dry Creek Road	77.2	79.3	2.1	962
SR 101	Lytton Springs Road	77.0	79.1	2.1	939
SR 101	Independence Lane	76.9	79.0	2.1	926
SR 101	South Geyserville	76.3	78.3	2.1	835
SR 101	Jct. Rte. 128 East, Canyon Road	76.2	78.3	2.1	832
SR 101	Asti	76.2	78.3	2.1	829
SR 101	Dutcher Creek Road	76.2	78.3	2.1	829
SR 101	South Cloverdale	75.7	79.7	4.0	1030
SR 101	Central Cloverdale/Citrus	74.8	78.8	4.0	895

Roadway	***Segment***	***Predicted L_{dn}, at 50 Feet from Roadway Centerline***			***Distance to L_{dn} 60 dB Contour, Feet***
		Existing	***Future***	***Future minus Existing***	
	Fair Drive				
SR 101	Jct. Rte. 128 West	74.7	75.7	1.0	556
SR 116	Jct. Rte. 1; Jenner, South	62.1	63.0	0.9	79
SR 116	Austin Creek	65.5	66.5	0.9	135
SR 116	Monte Rio Road (Town Center)	66.7	67.6	0.9	161
SR 116	Guernewood Park, Hulbert Creek Bridge	68.9	69.9	0.9	227
SR 116	Guerneville, Armstrong Woods Road	66.7	67.7	0.9	162
SR 116	Santa Nella Winery Road	61.8	62.8	0.9	77
SR 116	Forestville, Mirabel Road	68.4	69.3	0.9	209
SR 116	Guerneville Road	68.2	65.1	-3.1	110
SR 116	Graton/Frei Roads	69.8	69.4	-0.4	211
SR 116	Occidental/Molino Roads	69.8	69.4	-0.4	213
SR 116	Sebastopol, Covert Lane	71.0	70.7	-0.4	257
SR 116	Sebastopol, On Main Street	70.5	70.2	-0.4	238
SR 116	Sebastopol, On Petaluma Avenue	68.3	67.9	-0.4	169
SR 116	Sebastopol, Jct. Rte. 12 East	69.4	71.3	1.8	282
SR 116	Sebastopol, Jct. Rte. 12 East	69.6	71.4	1.8	288
SR 116	Sebastopol, Petaluma Avenue	72.2	74.0	1.8	427
SR 116	Bloomfield Road	70.3	72.2	1.8	323
SR 116	Mt. Vernon/Lone Pine Roads	70.4	72.2	1.8	325

Roadway	Segment	Predicted L_{dn}, at 50 Feet from Roadway Centerline			Distance to L_{dn} 60 dB Contour, Feet
		Existing	Future	Future minus Existing	
SR 116	Stony Point Road (East)	70.1	71.9	1.8	310
SR 116	Petaluma, South Jct. Rte. 101	75.8	77.6	1.8	750
SR 116	Frates Road/Cader Lane	74.7	76.5	1.8	630
SR 116	Lakeville Road	64.9	66.7	1.8	140
SR 116	Adobe Road	73.4	76.9	3.5	664
SR 116	Watmaugh Road (To Sonoma)	72.6	76.1	3.5	590
SR 116	Arnold Drive	73.2	76.7	3.5	647
SR 121	Jct. Rte. 37	73.0	73.7	0.6	407
SR 121	Jct. Rte. 116 West, Arnold Drive	74.1	74.4	0.3	456
SR 121	Jct. Rte. 12 North; Schellville, West	73.6	73.9	0.3	419
SR 121	Schellville, Eighth Street	73.7	73.9	0.3	425
SR 121	Ramal Road	73.1	73.4	0.3	390
SR 121	Napa Road	75.7	75.7	0.0	560
SR 121	Mendocino-Sonoma County Line	64.2	64.2	0.0	96
SR 121	South Jct. Rte. 101, Canyon Road	64.4	64.4	0.0	99
SR 121	Canyon Road/Old Redwood Highway	64.5	64.5	0.0	100
SR 121	River Road	62.5	62.5	0.0	74
SR 121	Geyersville, Old Redwood Highway	65.4	65.5	0.0	116
SR 121	Geysers Road	63.7	63.7	0.0	88
SR 121	Alexander Valley Road	67.3	67.3	0.0	153
SR 121	Pine Flat Road	66.6	66.6	0.0	139

Roadway	Segment	Predicted L_{dn}, at 50 Feet from Roadway Centerline			Distance to L_{dn} 60 dB Contour, Feet
		Existing	Future	Future minus Existing	
SR 128	Chalk Hill Road	64.8	66.9	2.2	145
SR 128	Kellogg, Franz Valley Road	63.2	64.1	1.0	94
SR 128	Sonoma County-Napa County	64.9	63.7	-1.2	88
Adobe Rd	E/Old Redwood Hwy N	62.7	64.5	1.8	99
Adobe Rd	W/Petaluma Hill Rd	63.4	65.1	1.8	110
Adobe Rd	W/Woodward Ave	68.0	69.8	1.8	225
Adobe Rd	E/Woodward Ave	68.0	69.8	1.8	225
Adobe Rd	W/ Corona Rd	68.7	70.5	1.8	249
Adobe Rd	W/ East Washington Rd	68.4	70.9	2.5	265
Adobe Rd	E/ East Washington Rd	68.7	70.9	2.2	265
Adobe Rd	E/ Frates Rd	69.3	71.5	2.3	294
Agua Caliente Rd	E/Arnold Dr	58.0	59.9	1.9	49
Airport Blvd	W/Ordinance Rd	60.2	62.8	2.6	77
Airport Blvd	W/Laughlin Rd	61.2	63.8	2.6	89
Airport Blvd	E/ Skylane	66.4	69.0	2.6	200
Airport Blvd	E/ Brickway	68.1	70.7	2.6	257
Airport Blvd	W/ Regional Parkway	66.9	69.5	2.6	215
Airport Blvd	E/ Concourse Blvd	66.9	69.4	2.6	213
Airport Blvd	E/ RR Tracks	68.3	70.9	2.6	266
Airport Blvd	E/ Regional Pkwy	69.1	71.7	2.6	301
Airport Blvd	E/ Aviation Blvd	70.7	73.3	2.6	383
Airport Blvd	W/ Fulton Rd	66.7	69.3	2.6	208
Airport Blvd	E/ Fulton Rd	67.2	69.8	2.6	225
Airport Blvd	W/ Faught Rd	63.6	66.2	2.6	130
Alexander Valley Rd	W/ Lytton Station Rd	63.3	64.4	1.1	98

Roadway	***Segment***	***Predicted L_{dn}, at 50 Feet from Roadway Centerline***			***Distance to L_{dn} 60 dB Contour, Feet***
		Existing	***Future***	***Future minus Existing***	
Armstrong Woods Rd	N/ Hwy 116	58.5	59.6	1.1	47
Armstrong Woods Rd	N/ Watson	53.3	54.5	1.1	21
Arnold Dr	S/ Watmaugh Rd	69.0	70.9	1.9	268
Arnold Dr	N/ Watmaugh Rd	70.2	70.9	0.8	268
Arnold Dr	N/ Almeria	70.6	72.3	1.7	328
Arnold Dr	N/ Leveroni Rd	69.6	71.3	1.7	284
Arnold Dr	S/ Petaluma Ave	68.9	70.6	1.7	253
Arnold Dr	N/ Solano Ave	69.7	71.4	1.7	286
Arnold Dr	N/ Verano Ave	69.8	71.4	1.7	289
Arnold Dr	S/ Agua Caliente Rd	69.2	70.9	1.7	267
Arnold Dr	N/ Agua Caliente Rd	68.3	69.7	1.4	221
Arnold Dr	N/ Chauvet Rd	63.6	65.0	1.4	108
Arnold Dr	S/ London Ranch Rd	63.7	65.1	1.4	110
Arnold Dr	S/ Dunbar Rd	61.6	63.0	1.4	79
Arnold Dr	S/ Hwy 12	61.8	62.9	1.1	78
Aviation Blvd	W/ Airport Ave	62.7	63.9	1.1	91
Barham Ave	E/ Dutton Ave	59.9	61.0	1.1	58
Barham Ave	W/ Olive St	54.4	55.5	1.1	25
Barham Ave	E/ Olive St	50.5	51.6	1.1	14
Barnes Rd	S/ River Rd	61.4	62.6	1.1	74
Bennet Valley Rd	W/ Grange Rd	65.3	69.2	3.9	205
Bennet Valley Rd	E/ Sonoma Mountain Rd	62.0	65.9	3.9	123
Bennet Valley Rd	W/ Warm Springs Rd	60.5	64.4	3.9	98
Bloomfield Rd	N/ Valley Ford Rd	57.1	58.2	1.1	38
Bloomfield Rd	S/ Kennedy Rd	61.4	62.5	1.1	74
Bloomfield Rd	S/ Pleasant Hill Rd	60.6	61.7	1.1	65
Bloomfield Rd	S/ Hwy 116	65.2	66.3	1.1	132

Roadway	***Segment***	***Predicted L_{dn}, at 50 Feet from Roadway Centerline***			***Distance to L_{dn} 60 dB Contour, Feet***
		Existing	***Future***	***Future minus Existing***	
Bodega Ave	W/ King Rd	64.1	65.2	1.1	111
Bodega Ave	W/ Thompson Ln	66.2	67.0	0.8	146
Bodega Ave	E/ Lohrman Ln	67.6	68.4	0.8	182
Bodega Ave	W/ Paula	67.7	68.5	0.8	186
Bodega Ave	E/ Paula	67.5	68.3	0.8	179
Bodega Hwy	E/ Valley Ford / Freestone Rd	67.6	68.5	0.8	183
Bodega Hwy	W/ Bohemian Hwy	67.2	68.1	0.8	172
Bodega Hwy	W/ Jonive	65.0	65.8	0.8	122
Bodega Hwy	E/ Wagnon Rd	65.5	66.4	0.8	133
Bodega Hwy	E/ Grandview Rd	66.8	67.7	0.8	162
Bodega Hwy	W/ Watertrough Rd	67.5	68.3	0.8	179
Bodega Hwy	E/ Watertrough Rd	68.2	69.1	0.8	201
Bohemian Hwy	S/ Hwy 116	63.5	65.6	2.0	117
Bohemian Hwy	N/ Freestone Flat Rd	60.3	62.3	2.0	71
Bohemian Hwy	S/ Bittner Rd	60.9	62.1	1.1	69
Bohemian Hwy	S/ Main St	60.9	62.1	1.1	69
Bohemian Hwy	N/ Graton Rd	62.4	63.6	1.1	86
Boyes Blvd	W/ Railroad Ave	59.4	60.5	1.1	54
Boyes Blvd	E/ Railroad Ave	62.3	63.5	1.1	85
Boyes Blvd	E/ Riverside Rd	61.3	62.4	1.1	72
Brush Creek Rd	N/ Montecito Ave	63.7	64.8	1.1	105
Calistoga Rd	S/ Rincon Ave	62.6	63.1	0.5	80
Calistoga Rd	S/ Porter Creek Rd	62.0	62.5	0.4	73
Corby Ave	S/ Smokewood Drive	62.3	63.5	1.1	85
Corby Ave	S/ Peach St	61.0	62.1	1.1	69
Corby Ave	N/ Peach St	60.3	61.5	1.1	63
Corona Rd	S/ Adobe Rd	63.5	65.9	2.4	123
Crane Canyon Rd	E/ Petaluma Hill Rd	61.9	67.6	5.7	161
Crane Canyon Rd	E/ Inverness Ave	59.5	65.2	5.7	111

Roadway	Segment	Predicted L_{dn}, at 50 Feet from Roadway Centerline			Distance to L_{dn} 60 dB Contour, Feet
		Existing	Future	Future minus Existing	
D St	S/ San Antonio Rd	61.5	62.7	1.2	76
Dry Creek Rd	N/ Lytton Springs Rd	65.0	67.8	2.8	167
Dry Creek Rd	N/ Lambert Bridge Rd	62.9	65.7	2.8	120
Dutton Ave	N/ Hearn Ave	61.4	62.6	1.1	74
Dutton Ave	S/ Barham Ave	62.8	64.0	1.1	92
East Cotati Ave	W/ Petaluma Hill Rd	64.4	65.0	0.7	108
East Napa St	W/ Seventh St. East	62.3	63.4	1.1	85
East Washington St	S/ Adobe Rd	63.4	65.0	1.7	108
Eighth St East	N/ Hwy 12 / 121	58.4	59.8	1.4	48
Eighth St East	S/ Napa Rd	62.0	62.3	0.3	71
Eighth St East	N/ Napa Rd	63.0	63.3	0.3	83
Eighth St East	S/ East Napa St	61.7	62.0	0.3	68
Ely Rd	E/ Old Redwood Hwy N	60.8	61.9	1.1	67
Fifth St West	N/ Leveroni Rd	66.3	67.5	1.1	158
Frates Rd	S/ Adobe Rd	64.5	65.0	0.5	108
Fulton Rd	S/ River Rd	68.7	71.9	3.2	311
Fulton Rd	N/ River Rd	69.2	72.4	3.1	333
Grange Rd	S/ Bennet Valley Rd	63.5	66.7	3.1	139
Graton Rd	W/ Green Hill Rd	58.0	58.4	0.4	39
Graton Rd	W/ Ross Rd	58.1	58.5	0.4	40
Graton Rd	W/ Hwy 116	57.6	58.0	0.4	37
Green Valley Rd	E/ Hwy 116	46.6	47.7	1.1	8
Green Valley Rd	E/ Harrison Grade Rd	50.1	51.3	1.1	13
Green Valley Rd	W/ Hwy 116	58.3	59.4	1.1	46
Guerneville Rd	E/ Vine Hill Rd	64.8	66.5	1.7	137
Guerneville Rd	E/ Frei Rd	65.9	67.2	1.3	150
Guerneville Rd	W/ Willowside Rd	69.4	70.7	1.3	256

Roadway	Segment	Predicted L_{dn}, at 50 Feet from Roadway Centerline			Distance to L_{dn} 60 dB Contour, Feet
		Existing	Future	Future minus Existing	
Guerneville Rd	E/ Willowside Rd	70.7	72.0	1.3	315
Guerneville Rd	W/ Lance Ave	68.3	69.5	1.3	216
Hearn Ave	W/ Dutton Ave	62.4	63.5	1.1	86
Hearn Ave	E/ Dutton Ave	66.6	67.8	1.1	165
High School Rd	N/ East Hurlbut Ave	62.1	63.2	1.1	82
High School Rd	S/ Occidental Rd	62.3	63.5	1.1	85
Lakeville Rd	N/ Hwy 37	71.4	72.7	1.3	352
Lakeville Rd	N/ Cannon Ln	71.2	72.5	1.3	343
Leveroni Rd	E/ Arnold Dr	68.7	71.0	2.3	270
Leveroni Rd	E/ Harrington	67.5	69.8	2.3	226
Llano Rd	N/ Hwy 116	62.4	63.5	1.1	85
Llano Rd	N/ Ludwig Ave	65.7	66.8	1.1	141
Lone Pine Rd	W/ Hwy 116	60.6	61.7	1.1	65
Ludwig Ave	W/ Stony Pt. Rd	63.4	64.6	1.1	101
Madrone Rd	W/ Hwy 12	59.4	60.6	1.1	55
Main St	S/ Hwy 12	58.0	58.8	0.8	42
Main St	S/ Adobe Rd	62.8	63.7	0.8	88
Main St	N/ Tyrone Rd	54.7	55.5	0.8	25
Mark West Springs Rd	E/ Hwy 101	70.1	73.0	2.9	367
Mark West Springs Rd	E/ Ursuline Rd	68.7	71.5	2.9	294
Mark West Springs Rd	W/ Mark West Springs Lodge	65.8	68.7	2.9	189
Mark West Springs Rd	E/ Michele Way	66.0	68.8	2.9	194
Mark West Springs Rd	W/ Porter Creek Rd	66.4	67.2	0.8	152
Mark West Springs Rd	E/ Trenton Healdsburg Rd	54.8	55.6	0.8	25
Mecham Rd	S/ Dump	60.0	61.3	1.2	61

Roadway	Segment	Predicted L_{dn}, at 50 Feet from Roadway Centerline			Distance to L_{dn} 60 dB Contour, Feet
		Existing	Future	Future minus Existing	
Mecham Rd	N/ Pepper Rd	59.9	61.1	1.2	59
Mecham Rd	N/ Refuse Rd	62.9	64.2	1.2	95
Mecham Rd	S/ Stony Pt. Rd	62.6	63.8	1.2	89
Mill Station Rd	W/ Occidental Rd	57.3	58.5	1.1	40
Millbrae Ave	W/ Stony Pt. Rd	57.6	59.0	1.4	43
Millbrae Ave	E/ Stony Pt. Rd	64.6	66.0	1.4	125
Mirabel Rd	S/ Trenton Rd	66.1	66.6	0.5	139
Moorland Ave	N/ Todd Rd	59.9	61.1	1.1	59
Mountain View Ave	E/ Santa Rosa Ave	61.1	65.6	4.5	118
Mountain View Ave	W/ Hunter Ln	59.8	64.3	4.5	97
Mountain View Ave	E/ Hunter Ln	59.0	63.5	4.5	85
Napa Rd	W/ Fifth St East	65.7	66.9	1.1	143
Napa Rd	E/ Pueblo Ave	66.0	67.1	1.1	149
Napa Rd	W/ Eighth St East	66.0	67.1	1.1	149
Napa Rd	W/ Hyde Rd	66.3	67.4	1.1	156
Napa Rd	E/ Burndale Rd	66.0	66.7	0.7	140
Occidental Rd	E/ Mill St	65.0	65.8	0.8	122
Occidental Rd	E/ Hwy 116	67.0	67.8	0.8	166
Occidental Rd	W/ Sanford Rd	67.9	69.0	1.1	200
Occidental Rd	E/ High School Rd	66.4	67.5	1.1	158
Occidental Rd	E/ Irwin Ln	66.7	67.8	1.1	165
Occidental Rd	E/ Merced	66.6	67.7	1.1	164
Old Redwood Hwy	N/ Mendocino	68.2	72.6	4.4	346
Old Redwood Hwy	S/ Ursuline	68.3	72.8	4.4	354
Old Redwood Hwy	N/ Mark West Springs Rd	69.6	74.0	4.4	431

Roadway	Segment	Predicted L_{dn}, at 50 Feet from Roadway Centerline			Distance to L_{dn} 60 dB Contour, Feet
		Existing	Future	Future minus Existing	
Old Redwood Hwy	S/ Wikiup Dr	68.7	73.2	4.4	377
Old Redwood Hwy	N/ Mark West Circle Bridge	68.9	73.3	4.4	388
Old Redwood Hwy	N/ Wikiup Dr	68.1	72.6	4.4	345
Old Redwood Hwy	N/ Faught Rd	68.0	72.4	4.4	337
Old Redwood Hwy	N/ Fulton Rd	67.8	71.5	3.7	292
Old Redwood Hwy	N/ Eastside Rd	65.5	68.4	2.9	182
Old Redwood Hwy	N/ Ely Rd	70.2	72.5	2.3	340
Old Redwood Hwy	N/ Adobe Rd	67.5	69.7	2.3	223
Old Redwood Hwy	S/ West Railroad Ave	68.0	70.3	2.3	243
Old Redwood Hwy	N/ West Railroad Ave	68.2	70.5	2.3	251
Old Redwood Hwy	N/ East Railroad Ave	67.9	70.2	2.3	240
Olivet Rd	N/ Guerneville Rd	62.9	64.0	1.1	92
Olivet Rd	S/ River Rd	62.3	63.4	1.1	84
Pepper Rd	E/ Walker Rd	64.8	65.4	0.6	114
Pepper Rd	E/ Mecham Rd	62.6	63.2	0.6	81
Pepper Rd	W/ Stony Pt. Rd	64.0	64.6	0.6	101
Petaluma Ave	E/ Arnold Dr	64.0	65.4	1.4	114
Petaluma Blvd N	N/ Skillman Ln	70.7	70.6	-0.1	253
Petaluma Blvd S	N/ Hwy 101 S/B Off Ramp	69.7	71.9	2.2	308
Petaluma Hill Rd	N/ Adobe Rd	71.2	73.4	2.2	390
Petaluma Hill Rd	S/ East Railroad Ave	71.3	73.5	2.2	394

Roadway	Segment	Predicted L_{dn}, at 50 Feet from Roadway Centerline			Distance to L_{dn} 60 dB Contour, Feet
		Existing	Future	Future minus Existing	
Petaluma Hill Rd	N/ East Railroad Ave	71.5	73.6	2.2	406
Petaluma Hill Rd	N/ Roberts Rd	70.4	72.6	2.2	344
Petaluma Hill Rd	N/ East Cotati Ave	70.9	73.1	2.2	374
Petaluma Hill Rd	S/ Crane Canyon Rd	70.9	73.0	2.2	369
Petaluma Hill Rd	N/ Crane Canyon Rd	68.7	70.9	2.2	265
Petaluma Hill Rd	N/ Snyder Ln	71.8	75.4	3.6	532
Petrified Forest Rd	W/ Sharp Rd	67.7	68.9	1.1	195
Porter Creek Rd	E/ Franz Valley Rd	62.8	63.9	1.1	91
Railroad Ave	S/ Verano Ave	54.3	55.5	1.1	25
Railroad Ave	N/ Verano Ave	62.7	63.9	1.1	90
Railroad Ave	S/ Boyes Blvd	59.8	60.9	1.1	58
Railroad Ave	N/ Boyes Blvd	56.2	57.4	1.1	33
Riebli Rd	W/ Wilshire Dr	61.9	63.1	1.1	80
River Rd	W/ Orchard Rd	66.0	67.2	1.1	150
River Rd	E/ Canyon Two Rd	65.7	66.8	1.1	142
River Rd	W/ Mirabel Rd	66.2	67.4	1.2	155
River Rd	W/ Trenton-Healdsburg Rd	65.5	66.6	1.1	138
River Rd	W/ Fulton Rd	66.6	67.9	1.3	168
River Rd	E/ Fulton Rd	66.4	67.7	1.3	162
Riverside Dr	N/ Hwy 12	64.6	65.4	0.8	115
Riverside Dr	N/ Petaluma Ave	61.5	62.3	0.8	72
Riverside Dr	S/ Grove St	59.6	60.4	0.8	53
Riverside Dr	N/ Grove St	55.8	56.6	0.8	30
Riverside Dr	N/ Verano Ave	57.8	58.7	0.8	41
Roblar Rd	W/ Canfield Rd	58.3	59.6	1.3	47
Roblar Rd	E/ Canfield Rd	60.3	61.6	1.3	64
Roblar Rd	W/ Stony Pt. Rd	63.2	64.5	1.3	100
Rohnert Park Exp	E/ Stony Pt. Rd	69.3	72.6	3.3	345
Rohnert Park Exp	W/ Petaluma Hill Rd	67.5	69.8	2.3	224

Roadway	Segment	Predicted L_{dn}, at 50 Feet from Roadway Centerline			Distance to L_{dn} 60 dB Contour, Feet
		Existing	Future	Future minus Existing	
Santa Rosa Ave	S/ Horn Ave	67.0	69.4	2.3	210
Santa Rosa Ave	S/ Mountain View Ave	68.2	70.5	2.3	251
Santa Rosa Ave	N/ Mountain View Ave	68.9	71.2	2.3	279
Santa Rosa Ave	S/ East Robles Ave	68.4	70.7	2.3	259
Santa Rosa Ave	N/ East Robles Ave	67.6	69.9	2.3	229
Sebastopol Rd	E/ Stony Pt. Rd	68.9	70.0	1.1	233
Sebastopol Rd	E/ West Ave	70.0	71.1	1.1	275
Skillman Ln	E/ Bodega Ave	60.0	60.7	0.7	55
Skillman Ln	E/ Thompson Ln	62.8	63.6	0.7	86
Skillman Ln	W/ Petaluma Blvd	64.9	65.6	0.7	118
Skylane Blvd	N/ Airport Blvd	62.0	65.2	3.2	111
Snyder Ln	S/ Petaluma Hill Rd	66.1	68.0	2.0	171
Standish Ave	N/ Todd Rd	62.1	63.2	1.1	82
Stony Point Rd	S/ Pepper Rd	66.1	67.1	1.0	148
Stony Point Rd	N/ Pepper Rd	65.3	66.3	1.0	132
Stony Point Rd	S/ Mecham Rd	67.8	68.7	1.0	191
Stony Point Rd	N/ Mecham Rd	66.3	67.3	1.0	153
Stony Point Rd	N/ Roblar Rd	69.1	69.7	0.6	220
Stony Point Rd	S/ Madrone	67.8	68.4	0.6	182
Stony Point Rd	N/ Hwy 116	66.9	69.3	2.4	208
Stony Point Rd	N/ Rohnert Park Exp	66.1	68.5	2.4	183
Stony Point Rd	S/ Millbrae Ave	67.2	69.6	2.4	219
Stony Point Rd	N/ Millbrae Ave	67.6	69.9	2.4	230
Stony Point Rd	N/ Scenic Ave	68.6	70.3	1.7	242
Stony Point Rd	S/ Todd Rd	66.9	68.7	1.7	189
Stony Point Rd	N/ Todd Rd	68.0	69.8	1.7	224
Todd Rd	W/ Llano Rd	61.1	63.3	2.2	83
Todd Rd	W/ Stony Pt. Rd	63.0	65.2	2.2	111

Roadway	***Segment***	***Predicted L_{dn}, at 50 Feet from Roadway Centerline***			***Distance to L_{dn} 60 dB Contour, Feet***
		Existing	***Future***	***Future minus Existing***	
Todd Rd	E/ Stony Pt. Rd	64.6	66.8	2.2	142
Todd Rd	W/ Standish Ave	63.7	65.9	2.2	123
Todd Rd	E/ Standish Ave	66.7	68.9	2.2	197
Valley Ford Rd	E/ Gericke Rd	63.5	65.2	1.7	110
Valley Ford Rd	W/ Tomales Rd	63.7	65.4	1.7	114
Verano Ave	E/ Hickory St	60.1	61.2	1.1	60
Verano Ave	E/ Linden Ave	61.4	62.5	1.1	74
Verano Ave	W/ Railroad Ave	61.6	62.8	1.1	77
Verano Ave	W/ Riverside Dr	61.9	63.1	1.1	80
Verano Ave	E/ Riverside Dr	62.6	63.8	1.1	89
Verano Ave	W/ Hwy 12	62.8	64.0	1.1	92
Verano Ave	E/ Lomita Ave	61.4	62.5	1.1	74
Vine Hill Rd	S/ Guerneville	64.0	65.1	1.1	110
Warm Springs Rd	N/ Henno Rd	60.1	64.8	4.7	104
Warm Springs Rd	N/ Sonoma Mt Rd	59.3	64.0	4.7	93
Warm Springs Rd	S/ Lawndale	53.7	58.4	4.7	39
Warm Springs Rd	N/ Bennet Valley Rd	54.4	59.1	4.7	43
Warm Springs Rd	N/ Lawndale	55.9	60.6	4.7	55
Warm Springs Rd	S/ Hwy 12	56.2	60.9	4.7	57
Watertrough Rd	S/ Burnside Rd	61.8	62.9	1.1	78
Watertrough Rd	S/ Bodega Hwy	63.9	65.0	1.1	108
Watmaugh Rd	W/ Arnold Dr	64.2	64.3	0.1	97
Watmaugh Rd	E/ Arnold Dr	62.3	62.4	0.1	72
Watmaugh Rd	W/ Hwy 12	61.9	62.0	0.1	68
West Ave	N/ Gloria Dr	57.2	58.3	1.1	39
West Ave	S/ South Ave	58.5	59.7	1.1	47
West Ave	N/ South Ave	59.2	60.3	1.1	53
West Ave	S/ Sunset Ave	59.4	60.5	1.1	54
West Third St	W/ Dutton Ave	65.5	66.6	1.1	138

Roadway	Segment	Predicted L_{dn}, at 50 Feet from Roadway Centerline			Distance to L_{dn} 60 dB Contour, Feet
		Existing	Future	Future minus Existing	
Westside Rd	N/ Felta Rd	61.7	62.9	1.2	78
Westside Rd	S/ Kinley Dr	64.0	65.2	1.2	112
Wikiup Dr	E/ Old Redwood Hwy N	59.4	60.6	1.1	55
Note: Shaded cells indicate a substantial change in ambient noise levels.					

APPENDIX 7.8 HYDROLOGY AND GEOLOGY SOURCE INFORMATION

7.8 HYDROLOGY AND GEOLOGY SOURCE INFORMATION

Hydrology and Water Resources

The information in ***Section 4.5 Hydrology and Water Resources*** has been collected from a number of sources including the following: *North Coast Watershed Assessment Program, Gualala Watershed Synthesis Report,* California Resources Agency and California Environmental Protection Agency, 2003; *California's Groundwater – Bulletin 118,* Department of Water Resources, 1998 (updated 2002); *Gualala River Watershed, Literature Search and Assimilation,* Patrick Higgins, prepared on behalf of the Redwood Coast Land Conservancy, undated; *Summary of Findings, Water Resources Management Data Assessment, Sonoma County, California,* Kleinfelder, Inc., 2001; *Stemple Creek/Estero de San Antonio Watershed Enhancement Plan,* Marin County Resource Conservation District and Southern Sonoma County Resource Conservation District, 1994; *Water Quality Control Plan for the North Coast Region,* North Coast Regional Water Quality Control Board, 1993 (updated 2001); *Watershed Planning Chapter,* North Coast Regional Water Quality Control Board, 2002; *Package Treatment Plants,* CAC memo, Richard Rogers, October 17, 2002; *Water and Sewer Capacities: Preliminary Report,* CAC memo, Richard Rogers, August 15, 2002; *Sonoma County Code*, County of Sonoma; *The Russian River, an Assessment of its Condition and Governmental Oversight,* Sonoma County Water Agency, 1996; *Water Adequacy Evaluation,* Sonoma County Water Agency, 2000; *Sonoma County General Plan,* Sonoma County, 1989; *Petaluma Watershed Enhancement Plan,* Southern Sonoma County Resource Conservation District, 1999; *Gualala River total Maximum Daily Load for Sediment,* United States Environmental Protection Agency, Region IX, undated; and other documents pertaining to water resources submitted as part of the Water Resources Element of the *Draft GP 2020.*

The watershed information summarized in pages 4.5-1 thru 4.5-16 is a compilation of several sources and methods, including: (a) delineation of watershed areas in ArcView 3.2 GIS; (b) review of 1:24,000 and 1:100,000 USGS topo maps for general topographical characteristics and stream identification; (c) California Division of Mines and Geology, 1980. Geology for Planning in Sonoma County, Special Report 120.; (d) University of California, Santa Barbara, Biogeography Lab, 1998. California Gap Analysis; (e) California Resources Agency and California Environmental Protection Agency, 2003. *North Coast Watershed Assessment Program, Gualala Watershed Synthesis Report;* (f) Marin County Resource Conservation District and Southern Sonoma County Resource Conservation District, 1994. *Stemple Creek/Estero de San Antonio Watershed Enhancement Plan,* (g) North Coast Regional Water Quality Control Board, 1993 (updated 2001). *Water Quality Control Plan for the North Coast Region;* (h) North Coast Regional Water Quality Control Board, 2002. *Watershed Planning Chapter*; and (i) Southern Sonoma County Resource Conservation District, 1999. *Petaluma Watershed Enhancement Plan.*

Geology / Soils

The information in ***Section 4.7 Geology / Soils*** has been updated from basic geologic setting information previously developed for the *1978 General Plan* and *the 1989 General Plan*. The basic information sources for the *1978 General Plan* and *1989 General Plan* included numerous publications of the California Division of Mines and Geology, the U. S. Geological Survey and other agencies. Those sources of geologic information are still relevant and have been relied on, along with more recent publications, in describing the geologic setting in the preparation of the *GP 2020*. A few of those earlier sources are: *Geology for Planning in Sonoma County, Special Report 120*, Huffman, M. E., and Armstrong, C. F., California Division of Mines and Geology and the Sonoma County Planning Department, 1980; *Geologic Map of the Santa Rosa Quadrangle, California*, Wagner, D. L. and Bortugno, E. J., California Division of Mines and Geology, 1982, 1:250,000; *Earthquake Planning Scenario for a Magnitude 8.3 Earthquake on the San Andreas Fault in the San Francisco Bay Area, Special Publication 61*, Davis, J. F., et al., California Division of Mines and Geology, 1982; and *Soil Survey, Sonoma County, California*, Miller, V. C., USDA Soil Conservation Service and the University of California Agricultural Experiment Station, 1972.

APPENDIX 7.9 SOILS ASSOCIATION CHARACTERISTICS

Exhibit 7.9-1
Soils Association Characteristics

	Percent of County	Percent of Assoc.	Acreage	Capability Class	Shrink Swell [a]	Erosion Hazard [b]	Runoff Potential [c]	Hydro Group [d]	Septic Limit [e]	Major Use
Group A	10		101,056	-						
1. Clear Lake-Reyes Association	6		60,634	-	H	S	S	D	S	
Clear Lake Soils		50	30,317	II	H	S	S	D	S	Oats for Hay
Reyes Soils		40	24,253	IV	H	S	S	D	S	
Other Minor Soils		10	6,063	-						
2. Hair-Diablo Association	4		40,422	-	H	H	R	B	S	Pasture, Range, and Hay
Hair Soils		45	18,190	III-VI	H,M,L	H,M,S	R,M	B	S	
Diablo Soils		45	18,190	II-VI	H	H	R	B	S	
Other Minor Soils		10	4,042	-						
Group B	6		60,634	-						Pasture and Hay
3. Huichica-Wright-Zamora Asn	6		60,634	-	H	M,S	M,S		S	Pasture and Hay
Huichica Soils		35	21,222	III-IV	H,M	M,S	M,S	D	S	Prunes, Grapes
Wright Soils		30	18,190	III-IV	H,M,L	M,S	M,S	C	S	Row Crops
Zamora Soils		25	15,158	I-II	H,M	M,S	M,S	B	S	
Other Minor Soils		10	6,063	-						
Group C	4		40,422	-						Pasture, Hay, Row Crops, Grapes, and many Dairies
4. Pajaro Association	1									
Pajaro Soils		90	9,095	II-III	L	S	S	C	S	
Other Minor Soils										
5. Yolo-Cortina Pleasanton Asn	3		20,217	-	M		M	B	S	
Yolo Soils		60	18,190	I-II	M,L	M,S	M,S	B	S	All Crops
Cortina Soils		15	4,548	IV	L	S	S	A	L	
Pleasanton Soils		15	4,548	I-IV	M,L	S	M,S	B	S	
Other Minor Soils		10	3,032	-						
Group D	12		121,267	-						
6. Spreckles-Felta Association	4		40,422	-	H	H	R		S	Range, Pasture
Spreckles Soils		50	20,211	III-VI	H,M	H	R,M	C	S	
Felta Soils		40	16,199	IV-VII	L	H,M,S	VR,R,M,S	B	S	
Other Minor Soils		10	4,042	-						
7. Yorkville-Suther Association	8		80,845	-	H				S	
Yorkville Soils		40	32,338	VI	H,M	VH,H,M,S	VR,R,M,S	D	S	
Suther Soils		40	32,338	VI-VII	H,M	VH,H,M	VR,R	C	S	Range, Pasture

	Percent of County	Percent of Assoc.	Acreage	Capability Class	Shrink Swell [a]	Erosion Hazard [b]	Runoff Potential [c]	Hydro Group [d]	Septic Limit [e]	Major Use
Group D (cont.) Other Minor Soils		20	16,169	-						
Group E	50		505,225	-						
8. Goulding-Toomes-Guenoc	8		80,845	-	M	HMS	RMS		S	
Goulding Soils		70	56,591	III-VII	M,L	H,M,S	R,M,S	D	S	Range, Pasture
Toomes Soils		10	8,084	VII	M	H,M,S	VR,R,M,S	D	S	
Quenoc Soils		10	8,084	VI-VII	M	H,M,S	R,M,S	C	S	
Other Minor Soils		10	8,084	-						
9. Kidd-Forward-Cohasset Asn.	2		20,211	-	L				S	
Kidd Soils		30	6,063	VI-VII	L	H,M	VR,R,M	D	S	Range, Timber, Watershed, Recreation
Forward Soils		30	6,063	VI-VII	L	H,M,S	VR,R,M	C	S	
Cohasset Soils		20	4,042	IV-VII	M,L	H,M,S	VR,R,M	B	S	
Other Minor Soils		20	4,042	-						
10. Los Gatos-Henneke-Maymen	7		70,739	-						
Los Gatos Soils		50	35,370	VII	M,L	VH,H,M	VR,R	C	S	Watershed, Wildlife Habitat, Recreation
Henneke Soils		20	14,148	VII	L	VH,H,M,S	R	D	S	
Maymen Soils		20	14,148	VII	L	VH,H	VR,R	D	S	
Other Minor Soils		10	7,074	-						
11. Hugo-Josephine-Laughlin	33		333,485	-	M				S	
Hugo Soils		55	183,417	VI-VII	M	VH,H	VR,R	B	S	Commercial Timber
Josephine Soils		20	66,697	IV-VII	M,L	VH,H,M	VR,R,M	B	S	Commercial Timber
Laughlin Soils		15	50,023	IV-VII	M	VH,H,M,S	VR,R,M,S	C	S	Range, Pasture
Group F	18		181,9001	-	M	H	R		S	
12. Steinbeck-Los Osos Asn.	6		60,634	-	M	H	R		S	Range, Pasture
Steinbeck Soils		65	39,412	III-VI	M	H	R,M	B	S	
Los Osos Soils		25	15,158	III-VII	H,M	H,M,S	R,M,S	C	S	
Other Minor Soils		10	6,063	-						
13. Goldridge-Cotati-Sebastopol	6		60,634	-	M	H,S			S	
Godridge Soils		60	36,380	III-VI	M,L	H	R,M,S	B	S	Apples, Timber
Cotati Soils		20	12,125	III-VI	H,M,L	H	R	C	S	Range, Pasture
Sebastopol Soils		10	6,063	III-VI	M,L	H,M,S	M,S	B	S	
Other Minor Soils		10	6,063	-						
14. Kneeland-Rohnerville-Kinman	3		30,317	-	M				S	
Kneeland Soils		30	9,095	III-VII	M	VH,H,M,S	VR,R,M,S	C	S	
Rohnerville Soils		25	7,579	III-IV	M	M,S	M,S	B	S	Timber
Kinman Soils		25	7,579	IV-VI	H,M	H,M,S	R,M,S	C	S	
Other Minor Soils		20	6,063	-						

	Percent of County	Percent of Assoc.	Acreage	Capability Class	Shrink Swell [a]	Erosion Hazard [b]	Runoff Potential [c]	Hydro Group [d]	Septic Limit [e]	Major Use
15. Empire-Casper-Mendocino	3		30,317	-	L				S	
Empire Soils		35	10,611	VI	L	H,M	R,M	B	S	
Casper Soils		30	9,095	VI	L	H,M	R,M	B	S	
Mendocino Soils		20	6,063	VI	M,L	H,M,S	R,M,S	B	S	
Other Minor Soils		15	4,546	-						

[a] H = High
M = Moderate
L = Low

[b] VH = Very High
H = High
M = Moderate
S = Slight

[c] VR = Very Rapid
R = Rapid
M = Moderate
S = Slight

[d] A = Absorbs water rapidly, low runoff potential
B = Absorbs water moderately; moderate runoff potential
C = Absorbs water slowly; moderate runoff potential
D = Absorbs water very slowly; high runoff potential

[e] S = Severe
M = Moderate
L = Low

Source: *Sonoma County General Plan EIR*, Table 3-2.3, 1986.