DRAFT
ENVIRONMENTAL IMPACT REPORT

JASUD ESTATE VINEYARDS TIMBERLAND CONVERSION PROJECT

APRIL 2012

LEAD AGENCY:

California Department of Forestry and Fire Protection
P.O. Box 944246
Sacramento, CA 94244-2460

DRAFT
ENVIRONMENTAL IMPACT REPORT

JASUD ESTATE VINEYARDS TIMBERLAND CONVERSION PROJECT

APRIL 2012

LEAD AGENCY:

California Department of Forestry and Fire Protection
P.O. Box 944246
Sacramento, CA 94244-2460

PREPARED BY:

Analytical Environmental Services
1801 7th Street, Suite 100
Sacramento, CA 95811
(916) 447-3479
www.analyticalcorp.com

TABLE OF CONTENTS

JASUD ESTATE VINEYARDS TIMBERLAND CONVERSION PROJECT
DRAFT ENVIRONMENTAL IMPACT REPORT

1.0 INTRODUCTION 1-1
- 1.1 Project Background 1-1
- 1.2 Project Summary 1-1
- 1.3 Purpose of the EIR 1-2
- 1.4 EIR Process 1-3
- 1.5 Comments on the Notice of Preparation 1-4
- 1.6 Scope of the EIR 1-5
- 1.7 Effects Not Found to be Significant 1-6
- 1.8 Terminology Used in the EIR 1-7
- 1.9 EIR Organization 1-8

2.0 EXECUTIVE SUMMARY 2-1
- 2.1 Introduction 2-1
- 2.2 Project Description 2-1
- 2.3 Alternatives to the Proposed Project 2-2
- 2.4 Summary of Environmental Impacts 2-4

3.0 PROJECT DESCRIPTION 3-1
- 3.1 Project Location 3-1
- 3.2 Site and Vicinity 3-1
- 3.3 Project Objectives 3-6
- 3.4 Description of the Proposed Project 3-7

4.0 ENVIRONMENTAL SETTING, IMPACTS AND MITIGATION MEASURES 4.0
- 4.1 Agriculture and Forestry Resources 4.1-1
  - 4.1.1 Setting 4.1-1
  - 4.1.2 Regulatory Framework 4.1-2
  - 4.1.3 Impacts Analysis 4.1-6
- 4.2 Air Quality 4.2-1
  - 4.2.1 Setting 4.2-1
  - 4.2.2 Regulatory Framework 4.2-3
  - 4.2.3 Impacts Analysis 4.2-5
- 4.3 Biological Resources 4.3-1
  - 4.3.1 Methodology 4.3-1
  - 4.3.2 Regulatory Framework 4.3-1
  - 4.3.3 Environmental Setting 4.3-13
  - 4.3.4 Biotic Communities and Alliances 4.3-17
  - 4.3.5 Impacts Analysis 4.3-56
- 4.4 Cultural Resources 4.4-1
  - 4.4.1 Setting 4.4-1
  - 4.4.2 Regulatory Framework 4.4-8
  - 4.4.3 Impacts Analysis 4.4-10

4.5 Geology and Soils 4.5-1
4.5.1 Setting 4.5-1
4.5.2 Regulatory Framework 4.5-10
4.5.3 Impacts Analysis 4.5-12
4.6 Greenhouse Gas Emissions 4.6-1
4.6.1 Setting 4.6-1
4.6.2 Regulatory Framework 4.6-1
4.6.3 Impacts Analysis 4.6-5
4.7 Hazardous Materials 4.7-1
4.7.1 Setting 4.7-1
4.7.2 Regulatory Framework 4.7-2
4.7.3 Impacts Analysis 4.7-6
4.8 Hydrology and Water Quality 4.8-1
4.8.1 Setting 4.8-1
4.8.2 Regulatory Framework 4.8-9
4.8.3 Impacts Analysis 4.8-14
4.9 Land Use 4.9-1
4.9.1 Introduction 4.9-1
4.9.2 Regulatory Framework 4.9-1
4.9.3 Impacts Analysis 4.9-6
4.10 Noise 4.10-1
4.10.1 Regulatory Framework 4.10-1
4.10.2 Environmental Setting 4.10-5
4.10.3 Impact Analysis 4.10-10
4.11 Transportation and Circulation 4.11-1
4.11.1 Setting…. 4.11-1
4.11.2 Regulatory Framework 4.11-2
4.11.3 Impacts Analysis 4.11-3
5.0 ALTERNATIVES TO THE PROPOSED PROJECT 5-1
5.1 Introduction 5-1
5.2 Project Objectives 5-2
5.3 Alternatives to the Proposed Project 5-3
5.3.1 No Project Alternative 5-3
5.3.2 Reduction of Oak Woodland Impacts and Management Alternative 5-4
5.4 Alternatives Eliminated from Consideration 5-7
5.4.1 Selective Timber Harvest Alternative 5-7
5.5 Environmentally Superior Alternative 5-9
6.0 OTHER CEQA-REQUIRED SECTIONS 6-1
6.1 Indirect and Growth Inducing Impacts 6-1
6.2 Cumulative Impact Analysis 6-2
6.2.1 Geographic Scope 6-2
6.2.2 Cumulatively Considerable Impacts 6-3
6.2.2-1 Agriculture and Forestry Resources 6-3
. 6.2.2-2 Air Quality 6-5
6.2.2-3 Biological Resources 6-6
6.2.2-4 Cultural Resources 6-10
6.2.2-5 Geology and Soils 6-10
6.2.2-6 Greenhouse Gas Emissions 6-11
6.2.2-7 Hazardous Materials 6-12
6.2.2-8 Hydrology and Water Quality 6-12
6.2.2-9 Land Use 6-14
6.2.2-10 Noise 6-14

6.2.2-10 Transportation and Circulation 6-15
6.3 Significant and Unavoidable Impacts 6-16
6.4 Irreversible Changes 6-16
7.0 REPORT PREPARATION 7-1
7.1 Lead Agency 7-1
7.2 Responsible Agency 7-1
7.3 EIR Consultants 7-1
7.4 Federal Agencies Consulted 7-2
7.5 State Agencies Consulted 7-2
7.6 Local Government Agencies Consulted 7-3

LIST OF FIGURES

3-1 Regional Location Map 3-2
3-2 Project Site and Vicinity 3-3
3-3 Aerial Photograph 3-4
3-4a Timber Harvest Plan Area 3-10
3-4b Vineyard Conversion Site Plan 3-11
3-4c Erosion Control Plan Elements for Proposed Vineyard 3-12
3-5 Proposed Deer Fencing 3-15
4-1-1 FMMP Designations 4.1-4
4.3-1 Habitat Map 4.3-14
4.3-2 Napa County Vegetation Alliances 4.3-15
4.3-3 Biological Avoidance Areas 4.3-19
4.3-4a Site Photographs 4.3-22
4.3-4b Site Photographs 4.3-23
4.3-5 CNDDB 5-Mile Radius Results 4.3-39
4.3-6 Biological Mitigation Areas 4.3-60
4.5-1 Soils Map 4.5-4
4.5-2 Napa County Faults 4.5-8
4.9-1 Napa County Land Use Designations for Proposed Project Site 4.9-2
4.9-2 Napa County Zoning Ordinance for Proposed Project Site 4.9-3

LIST OF TABLES

2-1 Summary of Impacts and Mitigation Measures 2-5
3-1 Acreage of Proposed Vineyard Blocks 3-14
3-2 Typical Construction Elements and Equipment 3-18
4.2-1 California and National Ambient Air Quality Standards 4.2-3
4.2-2 Air Quality Data Summary for Napa Valley 2008-2010 ..... 4.2-5
4.2-3 Mitigated (Unmitigated) Construction Emissions from Vineyard Installation 4.2-6
4.2-4 Operational Increase in Emissions from Vineyard Conversion 4.2-8
4.3-1 Biotic Communities in Napa County and on the Subject Property 4.3-20
4.3-2 Special Status Species with Potential to Occur on the Property 4.3-32
4.5-1 Soil Characteristics on the Property 4.5-3
4.5-2 Pre-Project Estimated Sediment Delivery From Area within 200 ft of Streams and within Boundaries of Proposed Vineyard Blocks 4.5-15
4.5-3 Post-Project Sediment Delivery Rates 4.5-15
4.6-1 Greenhouse Gas Construction Emissions 4.6-7

4.6-2 Greenhouse Gas Operational Emissions....4.6-9
4.8-1 Rainfall Depths for Typical Recurrence Interval Storms on the Property....4.8-18
4.8-2 Composite Peak Flow Comparison for the Property....4.8-21
4.10-1 Federal Construction Noise Thresholds....4.10-1
4.10-2 Federal Noise Abatement Criteria Hourly A-Weighted Sound Level Decibels...4.10-2
4.10-3 Exterior Noise Level Standards (Levels Not to be Exceeded More than 30 Minutes in any Hour)....4.10-4
4.10-4 Noise Limits for Construction Activities....4.10-4
4.10-5 Definition of Acoustical Terms....4.10-6
4.10-6 Typical A-Weighted Sound Levels....4.10-7
4.10-7 Composite Peak Flow Comparison for the Property....4.10-9
4.10-8 Typical Construction Noise Levels....4.10-12
4.10-9 Typical Construction Equipment Noise....4.10-12
4.10-10 Predicted PPV at 75 and 600 Feet from Construction....4.10-13
4.11-1 Estimated Vehicle Trips and Construction Schedule....4.11-5
5.1 Environmental Impact Comparison between the Proposed Project and Project Alternatives....5-10
6-1 Erosion Control Plans in Kortum Canyon Creek Watershed....6-13

APPENDICES

Appendix A Notice of Preparation (NOP)
Notice of Completion and Environmental Document Transmittal
NOP Comments
Appendix B Erosion Control Plan
Appendix C URBEMIS Output Files
Appendix D Biological Resources Report
Appendix E Special Status Species Searches Table
Appendix F Hydrological Analysis
Appendix G Water Balance Assessment
Appendix H Geological and Geotechnical Evaluation
Appendix I Erosion and Sediment Deliver Analysis
Appendix J Erosion Mitigation Assessment Report
Appendix K Timber Harvest Plan
Appendix L Sustainable Pest Management Practices

SECTION 1.0
INTRODUCTION

This Jasud Estate Vineyards Timberland Conversion Project (Proposed Project) Draft Environmental Impact Report (Draft EIR) was prepared in accordance with the California Environmental Quality Act of 1970 (CEQA) as amended and the CEQA *Guidelines* (CEQA, 2011). The California Department of Forestry and Fire Protection (Cal Fire) is the Lead Agency for the environmental review of the Proposed Project evaluated herein and has the principal responsibility for approving the project. As required by CEQA *Guidelines* § 15121, this EIR will: (a) inform public agency decision-makers, (b) identify possible ways to minimize any potential adverse environmental effects of the Proposed Project, and (c) describe reasonable and feasible project alternatives.

1.1 PROJECT BACKGROUND

Cal Fire, as Lead Agency, is responsible for forestry management, which includes the administration of timber conversion projects, on non-federal lands in the State of California. Such activities are guided by the California Forest Practice Rules, as amended, which provide a CEQA-equivalent regulatory process for the analysis, review, and approval of the timber harvest element of the Proposed Project by Cal Fire.

The County of Napa is responsible for planning and land use in the unincorporated areas of the county, as described in the Napa County General Plan (2008). The Proposed Project entails a timber harvest and subsequent conversion to vineyard within Napa County, as described below. Since the Proposed Project requires an Erosion Control Plan (ECP) subject to review and approval by Napa County, Napa County is a Responsible Agency under CEQA for this EIR. This EIR was prepared in compliance with Napa County's Local Procedures for Implementing CEQA (Napa County, 2010).

1.2 PROJECT SUMMARY

The Proposed Project will occur entirely within Napa County assessor's parcel number (APN) 020-300-005, which totals 38± acres. Approximately 14± acres of timberland will be harvested on the property under a Timber Harvest Plan (THP) and Timber Conversion Plan (TCP), consistent with Forest Practice Rules. Subsequently, a 12± acre vineyard would be developed within the harvested area. The timber harvest will occur before the vineyard

conversion and installation of the onsite ECP under the Proposed Project, which are the components of the project that trigger the preparation of this EIR under CEQA.

In general, agriculture activities are not subject to Napa County (County) discretionary approval; however, projects involving grading, earthmoving, or land disturbance activities on slopes greater than five percent require preparation and approval of an ECP, which is subject to review under CEQA by the County. Since the vineyard development portion of the Proposed Project qualifies under County requirements for an ECP, the ECP for the Proposed Project (#P10-00309-ECPA) will be reviewed under this CEQA process and is included as an attachment to this EIR (**Appendix B**). The subject property is zoned for agricultural use and the proposed vineyard is consistent with the Napa County General Plan (2008) designation Agriculture Watershed district.

1.3 PURPOSE OF THE EIR

As described in CEQA *Guidelines* Section 15121(a), an EIR is an informational document that assesses potential environmental impacts of a proposed project, as well as identifies mitigation measures and alternatives to the proposed project that could reduce or avoid adverse environmental impacts. As the CEQA Lead Agency for this project, Cal Fire is required to consider the information in this EIR along with any other available information in deciding whether to approve the project. The basic requirements for an EIR include discussions of the environmental setting, environmental impacts, mitigation measures, alternatives, growth inducing impacts, and cumulative impacts. The EIR is an informational document used in the planning and decision-making process. It is not the intent of an EIR to recommend either approval or denial of a project.

1.3.1 TYPE OF DOCUMENT

This EIR is a “Project EIR,” pursuant to CEQA Guidelines Section 15161. A Project EIR examines the environmental impacts of a specific project. This type of EIR focuses on the changes in the environment that would result from implementation of the project, including construction and operation.

This EIR describes the environmental impacts of the various components of the project and suggests mitigation measures to avoid or reduce impacts to less than significant levels. The impact analyses in this report are based on a variety of sources, including agency consultation, various technical reports prepared by others, and field surveys.

1.3.2 ENVIRONMENTAL BASELINE

The subject property as it exists at the time of the Notice of Preparation (April 13, 2011) is considered the baseline conditions for analyzing the effects of the Proposed Project (**Appendix A**). **Section 4.0** includes detailed descriptions of the existing environmental baseline by resource area.

1.3.3 EIR DESIGN

This EIR considers the entirety of the Proposed Project, which includes the conversion of timberland to vineyard. In addition, the EIR analyzes the effectiveness of the erosion control measures as designed in #P10-00309-ECPA to control short- and long-term erosion and attenuate runoff. The Proposed Project is designed with the goal of being self-mitigating and the review and analysis provided in the EIR determines whether this goal is met or whether additional mitigation measures or erosion control measures are required.

Potential cumulative effects of the Proposed Project when combined with other past, present, or probable future projects are also considered in this EIR (see **Section 6.0**). Specific project elements considered in the review of cumulative effects of the Proposed Project are described in **Section 3.0 Project Description**, these elements include: the timber harvest and site-specific THP and TCP for the proposed 14± acre harvest area of the property; the conversion from timberland to vineyard for 13.5± acres within the harvested portion of the property; the development of a 12± acre vineyard within the converted area on the property; and the installation of erosion control measures as part of the ECP for 16.3± acres of the property. These elements are considered to be direct cumulative effects of the Proposed Project and are analyzed in **Section 6.0**.

1.4 EIR PROCESS

1.4.1 LEAD AGENCY

In accordance with CEQA *Guidelines* Sections 15050 and 15367, Cal Fire is the “Lead Agency,” which is defined as the “public agency which has the principal responsibility for carrying out or approving a project.” The Lead Agency is also responsible for determining the scope of the environmental analysis, preparing the EIR, and responding to comments received on the Draft EIR. Prior to making a decision on whether to approve a project, the Lead Agency is required to certify that the EIR has been completed in compliance with CEQA, that the decision-making body reviewed and considered the information in the EIR, and that the EIR reflects the independent judgment of the Lead Agency.

1.4.2 NOTICE OF PREPARATION

In accordance with CEQA *Guidelines* Section 15082, a Notice of Preparation (NOP) was circulated to the public, local, state, and federal agencies, and other known interested parties for a 30-day public and agency review period from April 13, 2011 to May 12, 2011 (**Appendix A**). The purpose of the NOP was to provide notification that an EIR for the Proposed Project was being prepared and to solicit public input on the scope and content of the document.

Comments from agencies and the public submitted in response to the NOP are included within **Appendix A**. Issues raised in these comments on the NOP are summarized in **Section 1.5**.

1.4.3 DRAFT EIR AND PUBLIC REVIEW

This Draft EIR is being circulated for public review and comment for a period of 45 days. During this period, the general public, organizations, and agencies can submit comments to the Lead Agency on the Draft EIR's accuracy and completeness. Release of the Draft EIR marks the beginning of a 45-day public review period pursuant to CEQA *Guidelines* § 15105.

1.4.4 FINAL EIR AND EIR CERTIFICATION

Upon completion of the public review period, a Final EIR will be prepared that will include the written comments on the Draft EIR received during the public review period and response to those comments. The Final EIR will address any revisions to the Draft EIR made in response to public comments. The Draft EIR and Final EIR together will comprise the EIR for the Proposed Project. Before Cal Fire can approve the project, it must first certify that the EIR has been completed in compliance with CEQA, that the Lead and Responsible Agencies have reviewed and considered the information in the EIR, and that the EIR reflects the independent judgment of Cal Fire. Cal Fire also will be required to adopt Findings of Fact, and for any impacts determined to be significant and unavoidable, adopt a Statement of Overriding Considerations.

1.5 COMMENTS ON THE NOTICE OF PREPARATION

Cal Fire received four comment letters on the NOP. These comment letters were considered during preparation of the Draft EIR and are presented in **Appendix A**. The following is a list of commenting agencies and organizations, and a summary of the concerns raised and the corresponding section of the EIR where these concerns are addressed:

- Native American Heritage Commission (NAHC) – recommends procedures to adequately comply with the provisions of CEQA in determining potential impacts to historical resources, including archeological resources. *This comment is addressed in* ***Section 4.4 Cultural Resources***;
- California Department of Fish and Game (CDFG) – states the necessity for a complete assessment of project-related impacts to special status species and habitats as well as streams and riparian resources. Information is included on CDFG recommended survey and monitoring methodology. CDFG states appropriate avoidance and mitigation should be disclosed for federally listed species and identifies northern spotted owl activity centers within two miles of the property. *These comments are addressed in* ***Section 4.3 Biological Resources***;
- State Water Resources Control Board (SWRCB) – recommends that the applicant contact the SWRCB to determine whether a water right permit or other water right approval is required. *This comment is addressed in* ***Section 4.8 Hydrology and Water Quality***.
- State Department of Toxic Substances Control – recommends a site assessment of past uses to determine presence/absence of hazardous materials and to adequately address if any remediation activities may be required to address any hazardous substances release. *This comment is addressed in* ***Section 4.7 Hazardous Materials***.

1.6 SCOPE OF THE EIR

In accordance with CEQA *Guidelines* § 15063 and in conjunction with comments received on the NOP (**Appendix A**), the issues discussed within this EIR are those that have been identified within the NOP as having potentially significant impacts. The following environmental issue areas were found to have the potential to be significantly affected by the Proposed Project and are therefore addressed in greater detail in this Draft EIR.

- Agriculture and Forestry Resources
- Air Quality
- Biological Resources
- Cultural Resources
- Geology and Soils
- Greenhouse Gas Emissions
- Hazardous Materials
- Hydrology and Water Quality
- Land Use
- Noise

- Transportation and Circulation

1.7 EFFECTS NOT FOUND TO BE SIGNIFICANT

CEQA *Guidelines* § 15128 states that an "EIR shall contain a statement briefly indicating the reasons that various possible significant effects of a project were determined not to be significant and were therefore not discussed in detail in the EIR." Potential impacts of the Proposed Project to the following environmental resource areas were identified as being less than significant and therefore are not evaluated in this EIR: Aesthetics, Mineral Resources, Population and Housing, Public Services, Recreation, and Utilities and Service Systems. The Proposed Project would result in either no impact or a less than significant impact to these issue areas for the following reasons:

- **Aesthetics**: The Proposed Project is located in rural Napa County with surrounding areas consisting of moderate to steep hills, ridges, and valleys supporting open space and agricultural lands (including vineyards). The Proposed Project is considered agricultural in nature and is compatible with surrounding land uses. Approximately 57 percent of the 38± acre property will not be impacted by the activities under the Proposed Project. Impacts to aesthetics are considered less than significant. See the analysis of aesthetics/visual resources addressed in the THP (**Appendix K**).
- **Mineral Resources**: Mineral resources have not been identified within the property according to Napa County Resource Maps. No impact would occur.
- **Population and Housing**: The Proposed Project does not involve the construction of new homes or businesses. Existing roads will be used during construction, project operation activities, and fire/emergency equipment access to the property. The Proposed Project would not induce substantial population growth either directly or indirectly or create a significant need for additional housing. While an average of approximately three seasonal workers are anticipated for the timber harvest phase, construction of the vineyard, and operation of the vineyard, this will not impact the housing supply in the area by causing an increased need for additional housing. Therefore, no new housing would be required as a result of the Proposed Project. Also, no residences or people would be displaced by the Proposed Project. Therefore, impacts to population and housing are considered less than significant.
- **Public Services**: The Proposed Project would not result in substantial growth that would require additional public services. The Proposed Project would not adversely impact the County's ability to provide fire and police protection, or impact the maintenance of schools, parks, or other public facilities. No impact would occur.

- **Recreation**: The Proposed Project would not result in substantial population growth or the associated increased use of recreational facilities, and does not include the construction or expansion of recreational facilities. The Proposed Project would also not adversely impact recreational opportunities or prohibit the maintenance of existing recreational opportunities. No impact would occur.
- **Utilities and Service Systems**: The Proposed Project would not exceed water treatment requirements or result in the construction of new water or wastewater treatment facilities. The Proposed Project would rely on spring water to establish the proposed vineyard from an existing spring on the property. It is anticipated that the Proposed Project would not require additional water supplies, such as connection to a public water supply, since once the vineyard is established it will be dry farmed. The proven capacity of the spring is sufficient to meet all anticipated project demand even during the first establishment years of the vineyard (refer to **Section 4.8**). Therefore, no need for use of public services for water is anticipated. To the degree needed during the timber harvest or peak periods of vineyard labor use, portapotties would be used onsite so no impacts to public wastewater systems would occur. Construction and operation of the Proposed Project would generate a minimum amount of construction waste or other solid waste; therefore, a less than significant impact is expected on the landfill capacity in the area. The Proposed Project would not conflict with any statutes or regulations related to solid waste. No significant increase in energy demand, which would cause an impact on public services, is anticipated from the Proposed Project. Impacts to utilities and service systems are considered less than significant.

1.8 TERMINOLOGY USED IN THE EIR

This EIR uses the following terminology to describe environmental effects of the Proposed Project and Alternatives:

- **Significance Criteria:** A set of criteria used by the Lead Agency to determine at what level or “threshold” an impact would be considered significant. Significance criteria used in this Draft EIR include factual or scientific information; regulatory standards of local, state, and federal agencies; and/or guiding and implementing goals and policies identified in local or state plans.
- **Less Than Significant Impact:** A less than significant impact would cause no substantial change in the environment (no mitigation required).
- **Less Than Significant Level:** The level below which an impact would cause no substantial change in the environment (no mitigation required).

- **Potentially Significant Impact:** A potentially significant impact may cause a substantial change in the environment; however, it is not certain that effects would exceed specified significance criteria. For CEQA purposes, a potentially significant impact is treated as if it were a significant impact. Mitigation measures and/or project alternatives are identified to reduce project effects to the environment.
- **Significant Impact:** A significant impact would cause a substantial adverse change in the physical conditions of the environment. Significant impacts are identified by the evaluation of effects using specified significance criteria. Mitigation measures and/or project alternatives are identified to reduce or avoid project effects to the environment.
- **Significant and Unavoidable Impact:** A significant and unavoidable impact would result in a substantial change in the environment that cannot be avoided or mitigated to a less than significant level if the project is implemented.
- **Cumulative Significant Impact:** A cumulative significant impact would result in a substantial change in the environment from effects of the project as well as surrounding projects and reasonably foreseeable development in the surrounding area. To be considered significant, a project's impact must make a cumulatively considerable contribution to a substantial change in the environment.
- **Mitigation**: Mitigation includes measures recommended in the Draft EIR and imposed as condition of approval by the Lead Agency that:
    - avoid the impact altogether by not taking a certain action or parts of an action;
    - minimize impacts by limiting the degree or magnitude of the action and its implementation;
    - rectify the impact by repairing, rehabilitating, or restoring the affected environment;
    - reduce or eliminate the impact over time by preservation and maintenance operations during the life of the project (for example, onsite preservation of forest habitat for the remaining 21.5± acres not impacted by the Proposed Project is proposed in **Section 4.3**); and
    - compensate for the impact by replacing or providing substitute resources or environments.

1.9 EIR ORGANIZATION

- **Section 1, Introduction and Scope of the Draft EIR** - Provides an introduction and overview of the EIR, describes the intended use of the EIR, and describes the review and certification process.

- **Section 2, Executive Summary** - Summarizes the elements of the project and the environmental impacts that could result from implementation of the Proposed Project, and provides a table which lists impacts, describes proposed mitigation measures, and indicates the level of significance of impacts after mitigation.
- **Section 3, Project Description** - Provides a detailed description of the Proposed Project, including its location, background information, major objectives, and technical characteristics.
- **Section 4, Environmental Setting, Impacts, and Mitigation Measures** - Describes the baseline environmental setting and provides an assessment of impacts for each issue area presented in **Section 1.4**. Each section is typically divided into three sub-sections: Existing Environmental Setting, Regulatory Framework, and Impacts and Mitigation Measures.
- **Section 5, Alternatives** - Describes and compares alternatives to the Proposed Project and associated environmental consequences.
- **Section 6, Other CEQA-Required Sections** - Provides discussions required by CEQA regarding impacts that would result from the Proposed Project, including a summary of cumulative impacts, secondary impacts, including potential impacts resulting from growth inducement, and significant irreversible changes to the environment.
- **Section 7, Report Preparation** - Lists report authors and agencies consulted for technical assistance in the preparation and review of the EIR.
- **Appendices** - Includes various documents and data directly related to the analysis presented in the Draft EIR.

REFERENCES

CEQA, 2011. *California Environmental Quality Act (CEQA) Guidelines.* Public Resources Code, Sections 21000-21178 (as amended January 1, 2011) and California Code of Regulations, Sections 15000-15387.

Napa County, 2010. *Napa County's Local Procedures for Implementing the California Environmental Quality Act.* Napa County Conservation, Development and Planning Department. Revised September 2010. Available online at: http://www.countyofnapa.org/planning/CEQA.

Napa County, 2008. *Napa County General Plan*. June 2008. Available online at: http://www.countyofnapa.org/GeneralPlan/.

SECTION 2.0

EXECUTIVE SUMMARY

2.1 INTRODUCTION

This Draft Environmental Impact Report (EIR) assesses the potential environmental impacts of the Jasud Estate Vineyards Timberland Conversion Project (Proposed Project). The California Department of Forestry and Fire Protection (Cal Fire) is the Lead Agency. Napa County is the Responsible Agency for the CEQA review and approval of the Erosion Control Plan (ECP) required prior to conversion to vineyard. Inquiries about the project and the CEQA process should be directed to:

Cal Fire, Resource Management
Attn: Dennis Hall, Chief for Forest Practice
P.O. Box 944246
Sacramento, CA 94244-2460
Email: SacramentoPublicComment@fire.ca.gov
(Please include "Jasud Vineyard" in email subject line)

2.2 PROJECT DESCRIPTION

2.2.1 PROJECT LOCATION

The Proposed Project is located approximately two miles south of the town of Calistoga in northwest Napa County, California at 2087 Diamond Mountain Road off State Route (SR)-29. The property is situated within Section 18, Township 8 North, Range 6 West of the Mount Diablo Baseline and Meridian (MDBM) on the "Calistoga, California," U.S. Geological Society (USGS) 7.5-minute quadrangle (quad). The property occurs entirely within Napa County assessor's parcel number (APN) 020-300-005, which totals 38± acres. The property is located within the Kortum Canyon Creek watershed, a sub-watershed of the larger Simmons Creek watershed (Calwater 2206.500102). Onsite elevations range from approximately 1,560 to 1,900 feet above mean sea level with up to 42 percent slopes.

The property is situated on a southeast facing ridge near the border of Sonoma County in northwestern Napa County. The Napa River is located to the northeast and Lake Hennessey is located to the southeast of the property. The property contains two Class III watercourses, one Class IV drainage, and a spring with adjacent wet area.

The property has been harvested for timber in the past and shows signs of succession and re-growth of shrubs and trees. There is one former residence site located in the center of the property and the remnants of a walnut orchard currently located in the southwest corner of the property; however, these areas are not included in the Proposed Project. Additional buildings on the property include a rustic cabin and farm outbuildings located on the northeastern portion of the property. These structures are located outside of the development envelope on the property and are also not included under the Proposed Project.

2.2.2 TIMBER HARVEST

Approximately 14 acres of timberland would be harvested on the property under a Timber Harvest Plan (THP) and Timber Conversion Plan (TCP), consistent with Forest Practice Rules, and performed under a separate CEQA-equivalent process lead by Cal Fire (**Appendix K**). The timber harvest would occur before implementation of the vineyard conversion and installation of the ECP, which are the direct components of the Proposed Project subject to this EIR.

2.2.3 EROSION CONTROL PLAN AND VINEYARD INSTALLATION

As described above, the precursor action to the Proposed Project includes the timber harvest and THP/TCP approvals, which are subject to Forest Practices Rules. The Proposed Project consists of two direct elements: the conversion of timberland to vineyard and installation of the ECP. All of these actions effect the development of the Proposed Project on the property and would occur in the following order: 1) the separate harvest of 14± acres of timberland on the property, permitted separately under a THP/TCP approved by Cal Fire; 2) the conversion of 13.5± acres within the 14± acre harvested area to vineyard blocks; 3) the development of 12± acre vineyard within the conversion area; and 4) the implementation of a County-approved ECP, which is required per County guidelines for the vineyard development since onsite slopes exceed a 5 percent grade. The 16.3± acre ECP area generally includes the 14± acre harvested area, associated vineyard farm avenue areas, and 1.3± acres for erosion control improvements to an existing onsite entry road to the property (which is located outside of the timber harvest and proposed vineyard footprint). Refer to **Section 3.0** for a complete description of the Proposed Project.

2.3 ALTERNATIVES TO THE PROPOSED PROJECT

CEQA *Guidelines* require EIRs to describe and evaluate a range of reasonable alternatives to a project, or to the location of a project, which would feasibly attain most of the basic project objectives and avoid or substantially lessen significant project impacts. Although there are no significant unmitigable project impacts identified for the Proposed Project, **Section 5.0** evaluates the considered alternatives to the Proposed Project. The potential

alternatives examined for the Proposed Project in this EIR include the No Project Alternative and the Reduction of Oak Woodland Impacts and Management Alternative, which are briefly described below. Refer to **Section 5.0** for a complete description of these alternatives.

2.3.1 NO PROJECT ALTERNATIVE

With the No Project Alternative, the property would continue to remain in its existing state as partially forested with small areas of open, non-native grassland and the residual orchard from past farming on the property. No changes to the existing forested areas, access road, or open space areas would occur.

2.3.2 REDUCTION OF OAK WOODLAND IMPACTS AND MANAGEMENT ALTERNATIVE

Under the Reduction of Oak Woodland Impacts and Management Alternative, sensitive oak woodland habitat on the property would be avoided from development and no management or enhancement activities would occur to the onsite oak woodland. Similar to the Proposed Project, 12± acres of vineyard would be developed following a harvest of approximately 14± acres of timberland on the property under this alternative. However, the site plan for the proposed vineyard would be re-designed to avoid all oak woodland habitat on the property. Instead, the vineyard acreage would be developed in other areas of the property. Under this alternative, the net vineyard acres removed from the northwestern portion of the property (where the oak woodland is located) would be developed on slopes ranging from approximately 30 to 35 percent near the southwestern and southeastern corners of the property. This alternative would also require the ECP to be re-designed. Since the oak woodland habitat onsite would be completely avoided, no management or enhancement activities would take place within these areas. The objective of the Reduction of Oak Woodland Impacts and Management Alternative is to reduce short-term impacts to Black Oak Woodland identified on the property (refer to **Figure 4.3-1**).

2.4 SUMMARY OF ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

Table 2-1 presents a summary of impacts and proposed mitigation measures for the Proposed Project by resource area that would avoid or minimize potential project-related impacts identified in **Section 4.0** of this EIR. In the table, the level of significance of each environmental impact is indicated both before and after the application of the recommended mitigation measure(s). Refer to the environmental analysis sections in **Chapter 4.0** for detailed discussions of all project impacts and mitigation measures.

Additional mitigation measures specific to the timber harvest element of the Proposed Project are included in the THP, which is provided as **Appendix K** to this EIR. These measures are specifically designed to reduce impacts related to timber removal and harvest activities on the property conducted pursuant to the terms of the THP and TCP under California Forest Practices Rules. Cal Fire is the Lead Agency for the approval of the TCP and THP, which will be performed under a separate CEQA-equivalent process lead by Cal Fire consistent with the Z'berg-Nejedly Forest Practice Act (Division 4, Chapter 8, Public Resources Code) and California Forest Practice Rules (Title 14, California Code of Regulations) (refer to **Section 3.0**). To eliminate redundancy and to provide clarification to the reader, the THP-specific mitigation measures contained within **Appendix K** are herein referenced. These additional mitigation measures shall be implemented for the Proposed Project along with the mitigation measures provided in **Table 2-1** below, organized by resource area.

Collectively, the mitigation measures included in **Table 2-1** below and in the THP (**Appendix K**) would reduce potentially significant impacts of the Proposed Project to a less than significant level.

TABLE 2-1
SUMMARY OF IMPACTS AND MITIGATION MEASURES

Environmental Impact	Level of Significance Before Mitigation	Mitigation Measure	Level of Significance After Mitigation
4.1 Agriculture and Forestry Resources **Impact 4.1-1:** The Proposed Project would result in the loss of forest land through conversion of forest land to non-forest use	Potentially Significant	**Mitigation Measure 4.1-1:** With implementation of mitigation to offset tree loss discussed in Section **4.3 Biological Resources**, impacts resulting from the loss of forest land would be considered less than significant.	Less than Significant due to mitigation and overall size
4.2 Air Quality **Impact 4.2-1:** During construction, land clearing, earthmoving, movement of vehicles, and wind erosion of exposed soil associated with implementation of the Proposed Project would have the potential to cause nuisance related to fugitive dust and exceedance of applicable BAAQMD thresholds for criteria pollutants.	Potentially Significant	**Mitigation Measure 4.2-1:** The Applicant shall implement a fugitive dust abatement program during the construction of #P10-00309-ECPA, which shall include the following elements: • Cover all trucks hauling soil, sand, and other loose materials or require all trucks to maintain at least two feet of freeboard. • Cover all exposed stockpiles. • Sweep streets daily (with water sweepers) if visible soil material is carried onto adjacent paved streets. • Limit traffic speeds on unpaved roads to 15 miles per hour (mph). • Suspend excavation and grading activity when winds (instantaneous gusts) exceed 25 mph. In addition to the above measures, the Applicant shall also implement the required basic construction mitigation measures as recommended by the BAAQMD during the construction of the Proposed Project, which shall include the following elements: • All exposed surfaces (e.g., parking areas, staging areas, and unpaved access roads) shall be watered as needed to ensure dust abatement. • Idling times shall be minimized either by shutting equipment off when not in use or reducing the maximum idling time to five minutes (as required by the California airborne toxics control measure Title 13, Section 2485 of the California Code of Regulations [CCR]). Clear signage shall be provided for construction workers at all access points. • All construction equipment shall be maintained and properly tuned in accordance with manufacturer's specifications. All equipment shall be checked by a certified mechanic and determined to be running in proper condition prior to operation. • Post a publicly visible sign with the telephone number and person to contact at the Lead Agency regarding dust	Less than Significant

Environmental Impact	Level of Significance Before Mitigation	Mitigation Measure	Level of Significance After Mitigation
		complaints. This person shall respond and take corrective action within 48 hours. The Air District's phone number shall also be visible to ensure compliance with applicable regulations. • All heavy duty construction equipment shall be fitted with diesel particulate matter filters and use only aqueous diesel fuel. The measures above are in addition to the permanent erosion control measures specified in #P10-00309-ECPA, which include establishing a permanent no till cover crop on all disturbed areas. The Proposed Project would not exceed the BAAQMD criteria pollutant threshold. The permanent erosion control measures would avoid the creation of nuisance dust and PM10 during operation of the Proposed Project, which would reduce these potentially significant impacts to a less than significant level	
Impact 4.2-2: Operation of the Proposed Project would attract additional vehicles to the property, resulting in new regional emissions; however, new emissions would not be substantial and a less than significant impact would result.	Less than Significant	**Mitigation Measure 4.2-2:** No mitigation is required.	Not Applicable
Impact 4.2-3: Construction of the Proposed Project would slightly increase traffic volumes and congestion levels on local roadways, resulting in changes to CO concentrations; however, changes in CO concentrations would not be substantial and a less than significant impact would result.	Less than Significant	**Mitigation Measure 4.2-3:** No mitigation is required. With the implementation of **Mitigation Measure 4.2-1** above, CO concentrations from construction would be reduced. Therefore, the Proposed Project's effect on CO concentrations during construction is considered less than significant.	Not Applicable
Impact 4.2-4: Project emissions have the potential to cause distress to sensitive receptors. However, project-related emissions would not be substantial and a less than significant impact would result.	Less than Significant	**Mitigation Measure 4.2-4:** No mitigation is required.	Not Applicable
Impact 4.2-5: Project operation could result in operational odors. However, odors from operation would not be substantial and a less than significant impact would result	Less than Significant	**Mitigation Measure 4.2-5:** No mitigation is required.	Not Applicable
4.3 Biological Resources **Impact 4.3-1:** Development of the Proposed Project would convert some onsite Oak Woodlands to vineyard. Although agricultural	Potentially Significant	**Mitigation Measure 4.3-1:** Impacts to oak woodland would be reduced to a less than significant level and would result in the greatest quality of oak woodland mitigation through a combination of onsite avoidance, protection, and enhancement. Mitigation to offset the removal of approximately 3.35 acres of oak woodland under the Proposed Project	Less than Significant

Environmental Impact	Level of Significance Before Mitigation	Mitigation Measure	Level of Significance After Mitigation
projects are generally exempt from the California Oak Woodlands Conservation Act (2001), the proposed development would conflict with Napa County Code Section 18.108.100, the General Plan Goals CON-2 and CON-6, and Policies CON-17 and CON-24.		would be accomplished through a combination of 1) avoidance of oak woodlands remaining within the property and immediate vicinity; 2) protection of oak woodlands having the highest habitat values; and 3) enhancement of existing oak woodlands onsite. These measures are discussed further below. 1. Avoidance The Proposed Project avoids approximately 3.35 acres of oak woodland, or roughly 50 percent of the oak woodland on the property. This avoidance would protect high value oak woodlands that occur onsite near drainages and springs which provide optimal perching and roosting habitat for raptors as well as habitat for many wildlife species. Additionally, for example, they provide moist conditions in the dry season by intercepting fog, which produces moist microclimates for plants and animals that require summer moisture. All protected oak trees shall be marked on the property with visible plastic fencing during construction (consistent with the construction fencing requirements in the ECP) and shall be avoided. Visible fencing shall be placed at the edge of the dripline (edge of the tree canopy) to protect above- and below-ground tissues of these trees, which shall be field verified by a registered professional forester. The following shall not occur within the dripline of any retained oak tree: parking or storage of vehicles, machinery or other equipment; stockpiling of excavated soils, rocks or construction materials; or dumping of oils or other chemicals. A registered professional forester shall perform any pruning deemed necessary onsite. 2. Protection and Enhancement Direct impacts to oak woodlands should be mitigated by protecting and enhancing the remaining onsite oak woodlands. Oak Woodland Enhancement Areas (**Figure 4.3-6**) shall be designated for protection and enhancement activities under the direction of a registered professional forester knowledgeable about the ecology of oak woodlands. **Figure 4.3-6** shows on the Oak Woodland Enhancement Areas, which are the target areas for protection and enhancement on the property.	

Environmental Impact	Level of Significance Before Mitigation	Mitigation Measure	Level of Significance After Mitigation
		A total of 3.35 acres shall be designated as Oak Woodland Enhancement Areas onsite and these areas shall be marked and protected during construction as well as protection during operation of the Proposed Project. The Oak Woodland Enhancement Areas shall be restricted from development and other uses that would degrade the quality of the habitat (including, but not limited to conversion to other land uses such as agriculture or urban development, and excessive off-road vehicle use that increases erosion) and should be otherwise restricted consistent with the goals and policies of Napa County. Methods to enhance the quality of the protected oak woodland onsite shall include selective cutting of Douglas Fir less than four inches diameter at breast height (dbh) so that all such trees are lopped and not removed from the site. Invasive broom shall be controlled by non-chemical methods such as weed whackers.	
Impact 4.3-2: Development of the Proposed Project would result in the removal of approximately 0.27 acre of Coast Redwood Forest (**Table 4.3-1**), a sensitive biotic community in Napa County (NCBDR, 2009) and may be inconsistent with Policies CON-17, CON-18, and CON-22.	Potentially Significant	**Mitigation Measure 4.3-2:** Impacts to approximately 0.27 acre of Coast Redwood Forest would be reduced to less than significant levels by the avoidance and protection of approximately 4.96 acres (95 percent) of the total acreage of this habitat type onsite. These Coast Redwood Enhancement Areas shall be marked and protected during construction as well as protected during operation of the Proposed Project. Figure 4.3-6 shows the Coast Redwood Enhancement Areas on the property. These areas shall be restricted from development and other uses that would degrade the quality of the habitat (including, but not limited to conversion to other land uses such as agriculture or urban development, and excessive off-road vehicle use that increases erosion) and should be otherwise restricted consistent with the goals and policies of Napa County. Any invasive broom identified within the Coast Redwood Enhancement Areas shall be controlled by the Applicant by non-chemical methods such as weed whackers.	Less than Significant
Impact 4.3-3: Development of the Proposed Project could result in impacts to wetlands or waters of the U.S. and may be inconsistent with Policies CON-26, CON-30 and CON-42.	Potentially Significant	**Mitigation Measure 4.3-3:** Project site design plans have been modified to avoid direct impacts to wetlands and jurisdictional waters of the U.S. In addition, the following measures will ensure further avoidance of impacts to wetlands and streams: 1. To avoid indirect impacts to waters of the U.S. and wetlands, avoidance buffers of 50 feet shall be established around the spring and adjacent wet area, consistent with the ECP. Temporary orange construction fencing shall be installed around these features and along the designated setbacks for the two onsite Class III streams per the ECP. All fencing shall	Less than Significant

Environmental Impact	Level of Significance Before Mitigation	Mitigation Measure	Level of Significance After Mitigation
		be installed prior to the commencement of any earthmoving activities and shall be field verified by a qualified biologist or registered professional forester. The fencing shall remain in place until all construction activities in the vicinity have been completed. 2. Construction activities shall be conducted during the dry season to minimize impacts related to erosion, water quality and aquatic resources and activities shall be conducted consistent with **Mitigation Measure 4.3-4** (below) to protect wildlife corridors. All disturbed areas shall be seeded and mulched to prevent erosion and sediment deposit into onsite water features and/or any off-site wetlands and waters of the U.S. 3. Staging areas shall be located away from the areas of wetland habitat onsite that are fenced off. Temporary stockpiling of excavated or imported material shall occur only in approved construction staging areas within the gross acres allocated for vineyard development (i.e., approved vineyard blocks and associated acreage). Excess excavated soil shall be used on site or disposed of at a regional landfill or other appropriate facility. Stockpiles that are to remain on the site through the wet season shall be protected to prevent erosion (e.g. with tarps, silt fences, or straw bales). 4. Standard precautions shall be employed by the construction contractor to prevent the accidental release of fuel, oil, lubricant, or other hazardous materials associated with construction activities into jurisdictional features.	
Impact 4.3-4: Development of the Proposed Project could interfere with existing wildlife movement area corridors and conflict with General Plan Policy CON-18 which relates to wildlife movement.	Potentially Significant	**Mitigation Measure 4.3-4:** Prior to approval of the ECP and THP, the plans shall be modified to include the following: 1. The ECP shall specify fencing with openings of no less than six inches for unrestricted movement of small animals. This would reduce potential restrictions on small animals while excluding deer, wild pigs and cattle from the vineyards. 2. The onsite stream corridors, spring, and wet area shall be protected from development and other uses that would degrade the quality of the habitat (including, but not limited to conversion to other land uses such as agriculture or urban development, and excessive off-road vehicle use that increases erosion)	Less than Significant

Environmental Impact	Level of Significance Before Mitigation	Mitigation Measure	Level of Significance After Mitigation
		consistent with the goals and policies of Napa County for sensitive habitats. Implementation of **Mitigation Measure 4.3-4**, combined with the remaining acres on the property proposed for protection (discussed in **Mitigation Measures 4.3-1**, **4.3-2**, and **4.3-3**) would reduce the potential impacts on wildlife corridors to less than significant levels.	
Impact 4.3-5: Development of the Proposed Project would have the potential to affect special status bird species.	Potentially Significant	**Mitigation Measure 4.3-5:** The Applicant shall implement the following measures to avoid disturbing any special status bird species nesting on the property. Vegetation removal conducted during the nesting period shall require a pre-construction survey for active bird nests, conducted by a qualified biologist. No known active nests shall be disturbed without a permit or other authorization from USFWS and/or CDFG. 1. Typical nesting season for raptors is March 1 through July 31. Any development of the site between the dates of March 1 through July 31 will require a pre-construction raptor survey. A qualified wildlife biologist should conduct pre-construction surveys of all potential nesting habitat for birds within 500 feet of earthmoving activities. Surveys for nesting birds should be conducted within 14 days prior to tree removal and/or ground breaking activities. If active bird nests are found during pre-construction surveys, a 500 foot no-disturbance buffer shall be created around active raptor nests during the breeding season or until it is determined that all young have fledged (**Appendix D**).	Less than Significant
Impact 4.3-6: Changes in habitat as a result of the Proposed Project were analyzed in the Northern Spotted Owl Take Avoidance report prepared by Forest Ecosystem Management, LLC in 2010 (updated in 2011) for the property (**Appendix D**). As stated in Section 4.3.4-10, according to the Northern Spotted Owl Take Avoidance report attached to the final Biological Resources Report in Appendix D (Forest Ecosystem Management, PLLC., 2011), the THP for the Proposed Project abides by California Forest Practice Rule (FPR) 14 CCR 919.9(e) Scenario 4: Avoidance of Disturbance and Direct Take through Habitat Retention.	Potentially Significant	**Mitigation 4.3-6:** The applicant shall implement the following measures to avoid take of the northern spotted owl (based on Forest Ecosystem Management, PLLC., 2011; **Appendix D**): 1. No timber operations shall occur until such time as a current years' NSO survey (following the appropriate and most current NSO survey protocol) has been completed, the results have been provided to the appropriate agency, and the results of a take avoidance determination has been incorporated into the plan. 2. No harvesting of trees shall occur until NAP007 is detected/located within their historic activity center during the year of planned timber harvest activities. The owl's activity center is located on private property; therefore, daytime monitoring of the owl may not be possible due to access issues.	Less than Significant

Environmental Impact	Level of Significance Before Mitigation	Mitigation Measure	Level of Significance After Mitigation
The habitat analysis performed on the property consistent with FPR 14 CCR 919.9(e) Scenario 4 concluded that there is suitable habitat for northern spotted owl within the property; territory NAP007 was detected through historic and current survey efforts within 1.3 miles of the proposed timber operations (Forest Ecosystem Management, PLLC., 2011). According to the Northern Spotted Owl Take Avoidance report, habitat typing was completed by Pam Town, Consulting Wildlife Biologist, using aerial photographs and old habitat maps. Theodore Wooster was consulted regarding habitat type accuracy as he is very familiar with the area as well as Scott Butler, the Registered Professional Forester for the proposed timber harvest element of the Proposed Project (Forest Ecosystem Management, PLLC., 2011). Therefore, the habitat typing was thoroughly reviewed for accuracy. Further, the home range acres for the two activity centers of NAP007 are above desired conditions within the 0.7 to 1.3-mile assessment areas for which habitat was assessed for northern spotted owl (Forest Ecosystem Management, PLLC., 2011). A core habitat area of nesting/roosting contiguous habitat greater than 100 acres does exist around the activity centers NAP007 #1 and #2 (Forest Ecosystem Management, PLLC., 2011). Development of the Proposed Project would result in the removal of 11.5 acres of nesting/roosting habitat and 4 acres of foraging habitat for northern spotted owl (Forest Ecosystem Management, PLLC, 2011). The area to be converted is located on the ridge tops, which are areas less likely to be used by northern spotted owls. Post-		If the owl is not detected within their historic activity centers, the property must be surveyed according to the current acceptable NSO protocol. 3. No timber harvest operations other than the use of existing roads will occur within 1,000 feet of the activity centers of NAP007. The activity centers for NAP007 are further than 1/4 mile from the THP boundary (1,472 feet - AC #1); therefore, at this time, no seasonal or harvest restrictions apply. However, if the activity center moves within 1/4 mile of the property boundary, the following seasonal restrictions may be applied by Cal Fire. a. Seasonal Restrictions: No operations from February 1 to July 30 within 1/4 mile of the activity centers of NAP007, except on the use of existing roads.	

Environmental Impact	Level of Significance Before Mitigation	Mitigation Measure	Level of Significance After Mitigation
project, there will be forested corridors between two of the vineyard blocks that may still retain the definition of nesting/roosting habitat; however, as it will be a narrow strip surrounded by vineyards, it would be classified as unsuitable habitat (Forest Ecosystem Management, PLLC, 2011). Impacts of the Proposed Project to northern spotted owl habitat were analyzed according to the acreage of suitable habitat post-project within a 0.7 mile radius of an activity center, whereby at least 200 acres of nesting/roosting habitat is the basis for the habitat retention standard (Forest Ecosystem Management, PLLC, 2011; Appendix D). The results of the analysis show that the habitat retention standard would be met post-timber harvest for both activity centers #1 and #2 of territory NAP007, for which NAP007 is the closest and only active territory within 0.7 mile of the project footprint. Also, the removal of habitat will not drop the necessary habitat retention standards below the minimal requirements (Forest Ecosystem Management, PLLC, 2011). Thus, the THP abides by California Forest Practice Rule 14 CCR 919.9(e) Scenario 4: Avoidance of Disturbance and Direct Take through Habitat Retention (Forest Ecosystem Management, PLLC, 2011). Combined, the acreage of northern spotted owl habitat that would be removed by the Proposed Project equals 14± acres or 2.8 percent of suitable habitat within a 0.7 mile radius or 1.04 percent of suitable habitat within a 1.3 mile radius of the property. Due to the small size of the project and the fact that the habitat retention standards would be met for post-project conditions for both activity centers NAP007 #1 and NAP007 #2,			

Environmental Impact	Level of Significance Before Mitigation	Mitigation Measure	Level of Significance After Mitigation
which are the closest activity centers to the Proposed Project and are the only activity centers within 0.7 miles of the project footprint, with implementation of Mitigation Measure 4.3-6, impacts to northern spotted owl habitat would be less than significant.			
Impact 4.3-7: Development of the Proposed Project could have the potential to affect Central Coast ESU Steelhead Salmon and its associated critical habitat, as well as other special status aquatic species. However, with the avoidance and mitigation measures as well as the erosion control measures in the ECP incorporated into the Proposed Project, impacts would be considered less than significant.	Less than Significant	**Mitigation 4.3-7:** No further mitigation is required.	Not Applicable
Impact 4.3-8: Development of the Proposed Project would have the potential to affect special status bat species.	Potentially Significant	**Mitigation Measure 4.3-8:** Pre-construction surveys for bats shall be conducted two to three days prior to tree removal. If bats are discovered during the surveys then a buffer of 100 to 150 feet will be established. Optimal time to remove trees is September 15 to October 15 and February 15 to April 1. Pre-construction surveys shall also focus on habitat adjacent to the Proposed Project (**Appendix D**).	Less than Significant
Impact 4.3-9: Development of the Proposed Project could result in conflicts with Napa County Code Section 18.108.025 (General provisions – Intermittent/perennial streams). Stream setbacks have been incorporated as part of the Proposed Project design.	Less than Significant	**Mitigation Measure 4.3-9:** No mitigation is required.	Not Applicable
4.4 Cultural Resources **Impact 4.4-1:** If agricultural or timber harvesting activities occur at the location of the identified Jasud Spring Site cultural resource such activities could negatively impact this cultural resource. This is a potentially significant impact. However, since this area will largely be buffered from project construction activities by the 50 foot setbacks for the spring and adjacent wet area, which are part of the Proposed Project's design, the likelihood for disturbance is low.	Potentially Significant	**Mitigation Measure 4.4-1:** The Jasud Spring archaeological site shall be avoided by all ground disturbing activities during project construction and a staked, visible boundary shall be marked around its perimeter by the Applicant or the Applicant's designee using the scale plan view map of the Jasud Spring Site prepared by Tom Origer and Associates. The Applicant shall install and maintain protective fencing along the outside of the perimeter to ensure protection during construction. During operation of the Proposed Project, no ground disturbing activities shall occur within the archaeological sites' perimeter.	Less than Significant

Environmental Impact	Level of Significance Before Mitigation	Mitigation Measure	Level of Significance After Mitigation
Impact 4.4-2: The project implementation has the potential to negatively impact previously unknown cultural resources within the project area.	Potentially Significant	**Mitigation Measure 4.4-2:** There is a possibility that subsurface archaeological deposits may exist within the proposed vineyard areas, as archaeological sites may be buried with no surface manifestation, or may be obscured by vegetation. In accordance with CEQA Guidelines Section 15064.5 (f), should any previously unknown prehistoric or historic resources, such as, but not limited to, obsidian and chert flaked-stone tools or tool making debris; shellfish remains, stone milling equipment, concrete, or adobe footings, walls, filled wells or privies, deposits of metal, glass, and/or ceramic refuse be encountered during onsite construction activities, earthwork within 100 feet of these materials shall be stopped and the Applicant shall consult with a professional archaeologist. Once the archaeologist has had the opportunity to evaluate the find he/she shall consult the local Cal Fire Archaeologist regarding the results of the evaluation and appropriate site treatment options, as necessary. Said measures shall be carried out prior to any resumption of related ceased earthwork. All significant cultural resource materials recovered shall be subject to scientific analysis, professional museum curation, and a report prepared by the qualified archaeologist according to current professional standards and a copy of the draft report provided to the local Cal Fire Archaeologist for review and approval prior to finalization of it.	Less than Significant
Impact 4.4-3: The project implementation could result in the discovery and disturbance of unknown human remains.	Potentially Significant	**Mitigation Measure 4.4-3:** In the event that human remains are discovered, the provisions of the California Health and Safety Code Section 7050.5 (b) shall be followed, including contacting the Napa County Coroner within 24 hours of the find. Upon determining the remains as being Native American in origin, the Coroner would be responsible for contacting the Native American Heritage Commission (NAHC) within 24 hours. The NAHC has various powers and duties to provide for the ultimate disposition of any Native American remains, as does the assigned Most Likely Descendant (MLD), who is designated by the NAHC.	Less than Significant
4.5 Geology and Soils **Impact 4.5-1:** Development of the Proposed Project would alter the rate of sediment erosion and yield onsite. This is a potentially significant impact. However upon implementation of the erosion control methods and stream setbacks detailed in the ECP, the timber harvest, vineyard conversion, and road segment improvements would all be designed to create a decrease in	Potentially Significant	**Mitigation Measure 4.5-1:** No further mitigation is required.	Less than Significant

Environmental Impact	Level of Significance Before Mitigation	Mitigation Measure	Level of Significance After Mitigation
sediment erosion and yield that would result in a less than significant impact to onsite and offsite receiving waters.			
Impact 4.5-2: Development of the Proposed Project would involve earthmoving and grading activities that would alter the existing topographic and geologic conditions at the property; however, conditions would not be altered such that significant damage to the property from excessive erosion, soil creep, catastrophic slope, or ground failure would occur nor would such hazards be likely to occur in the event of an earthquake.	Less than Significant	**Mitigation Measure 4.5-2:** No further mitigation is required.	Not Applicable
4.6 Greenhouse Gas Emissions **Impact 4.6-1:** Construction of the Proposed Project would emit GHGs and would have the potential to exacerbate global climate change. Project sources of GHG emissions during construction would include the transport and delivery of construction equipment to the property; operation of construction equipment, including equipment used for planting the vineyard and irrigation system installation; worker trips, fuel use, and material transport.	Potentially Significant	**Mitigation Measure 4.6-1:** The owner shall implement the following mitigation measures to reduce criteria pollutant emissions during the construction of the Proposed Project: 1. The owner shall maintain all construction equipment in accordance with manufactures' specifications. 2. The owner shall limit construction equipment idling to less than five minutes.	Less than Significant
Impact 4.6-2: Operation of the Proposed Project would emit GHGs and would have the potential to exacerbate global climate change. Project operational sources of GHG emission would include vehicles (produce and material transports and workers) traveling to and from the Proposed Project, energy use, and limited water transport.	Less than Significant	**Mitigation Measure 4.6-2:** No mitigation is required.	Not Applicable
4.7 Hazards and Hazardous Materials **Impact 4.7-1:** There is potential for incidental leakage, rupture or spillage when fueling agricultural equipment during construction and operation of the Proposed Project, which could result in hazards to the public or	Potentially Significant	**Mitigation Measure 4.7-1:** In addition to the erosion control measures that are shown in **Figure 3-4c**, personnel shall follow written SOPs for filling and servicing construction equipment and vehicles. The SOPs, which are designed to reduce the potential for incidents involving hazardous materials, shall include: • Refueling shall be conducted only with approved pumps, hoses, and nozzles.	Less than Significant

Environmental Impact	Level of Significance Before Mitigation	Mitigation Measure	Level of Significance After Mitigation
environment. If substantial quantities of diesel or unleaded gasoline reach soil or drainage areas, surface and/or groundwater quality may be degraded.		• Catch-pans shall be placed under equipment to catch potential spills during servicing. • All disconnected hoses shall be placed in containers to collect residual fuel from the hose. • Vehicle engines shall be shut down during refueling. • No smoking, open flames, or welding shall be allowed in refueling or service areas. • Refueling and all construction work shall be performed outside of any onsite stream buffer zones to prevent contamination of water in the event of a leak or spill. • Service trucks shall be provided with fire extinguishers and spill containment equipment, such as absorbents. • A spill containment kit that is recommended by the DEM or local fire department will be onsite and available to staff if a spill occurs. In the event that contaminated soil and/or groundwater or other hazardous materials are generated or encountered during construction, all work shall be halted in the affected area and the type and extent of the contamination shall be determined. Should a spill contaminate soil, the soil shall be put into containers and disposed of in accordance with federal, state, and local regulations. If containment and size of the spill is beyond the scope of the contractor, proper authorities shall be notified.	
Impact 4.7-2: In the event IPM techniques (as described in **Section 3.4.3**; and above in **Section 4.7.1-2**) are found to be inadequate for vineyard maintenance, the Proposed Project would include the use of pesticides for vineyard maintenance. Non-compliance with hazardous materials regulations including improper pesticide use, storage or disposal can be hazardous to human health and the environment.	Less than Significant	**Mitigation Measure 4.7-2:** In the event pesticides are used onsite, personnel shall follow SOPs when applying pesticides to the vineyard. SOPs for pesticide use, shall include the following: • Purchase only enough pesticide that would be used per season. • Utilize IPM techniques where feasible, such as the use of a permanent cover crop, beneficial insects, and minimal to no use of pesticides except when found necessary from monitoring and for fungicides. • All pesticides will be stored in their original containers. Labels on the containers will not be removed. • Pesticides will be kept in a well-ventilated locked area. • Pesticide storage areas will be 100 feet from any drainage area, stream, or groundwater well. • The best way to dispose of a small amount of pesticide is to use it. If a pesticide must be disposed of, contact the Napa County Agricultural Commissioner to locate a hazardous waste	Less than Significant

Environmental Impact	Level of Significance Before Mitigation	Mitigation Measure	Level of Significance After Mitigation
		facility for proper disposal. • Pesticides will never be poured down the sink, toilet, or stream. Proper personal protection equipment will be utilized when working with pesticides.	
Impact 4.7-3: The potential release of hazardous materials into the environment may affect on- or off-site surface water or groundwater during operation and maintenance of the vineyard.	Potentially Significant	**Mitigation Measure 4.7-3:** In addition to **Mitigation Measures 4.7-1** and **4.7-2**, fuel loading and chemical mixing areas should be established outside the proposed setbacks and away from any areas that could potentially drain off-site or potentially affect surface and groundwater quality. When farm equipment is cleaned at the existing facility, only rinse water that is free of gasoline residues, pesticides and other chemicals, and waste oils should be allowed to diffuse back into vineyard areas. In the event pesticides, herbicides or fungicides are used, all rinse water from farm equipment and rinse water from application equipment used to apply chemicals should be collected and stored in containers that are of sufficient size to contain the water until a hazardous materials transporter can remove the rinse water. No rinse water shall be drained to a septic system or discharged to ground or surface water to prevent the release of hazardous materials into the environment during operation and maintenance of the Proposed Project.	Less than Significant
4.8 Hydrology and Water Quality **Impact 4.8-1:** Development of the Proposed Project would alter the existing drainage pattern of the property. This is a potentially significant impact. However, with implementation of the ECP a slight decrease in the volume and rate of runoff onsite would occur and therefore a less than significant impact on receiving waters would result.	Potentially Significant	**Mitigation Measure 4.8-1:** No mitigation is required.	Less than Significant
Impact 4.8-2: Development of the Proposed Project has the potential to alter sedimentation levels in runoff flowing to off-site receiving waters.	Less than Significant	**Mitigation Measure 4.8-2:** No mitigation is required.	Not Applicable
Impact 4.8-3: The Proposed Project would not be located in a FEMA flood zone.	Less than Significant	**Mitigation Measure 4.8-3:** No mitigation is required.	Not Applicable
Impact 4.8-4: Development of the Proposed Project would not 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. This is considered a less than	Less than Significant	**Mitigation Measure 4.8-4:** No mitigation is required.	Not Applicable

Environmental Impact	Level of Significance Before Mitigation	Mitigation Measure	Level of Significance After Mitigation
significant impact.			
4.9 Land Use **Impact 4.9-1:** The Proposed Project would not result in a substantial inconsistency with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project adopted for the purpose of avoiding or mitigating an environmental effect.	Less than Significant	**Mitigation Measure 4.9-1:** No mitigation is required.	Not Applicable
4.10 Noise **Impact 4.10-1:** Construction and operation of the Proposed Project would not expose persons to a temporary or substantial permanent increase in the ambient noise level or generate noise levels in excess of standards established in the General Plan or County noise ordinance, or applicable standards of other	Less than Significant	**Mitigation Measure 4.10-1:** No mitigation is required.	Not Applicable
Impact 4.10-2: The Proposed Project would not expose persons to or generate excessive groundborne vibration noise levels.	Less than Significant	**Mitigation Measure 4.10-2:** No mitigation is required.	Not Applicable
Impact 4.10-3: The Proposed Project is not 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 in the vicinity of a private airstrip; therefore, the Proposed Project would not expose people residing or working in the project area to excessive noise levels.	Less than Significant	**Mitigation Measure 4.10-3:** No mitigation required.	Not Applicable
4.11 Transportation and Traffic **Impact 4.11-1:** Construction of the Proposed Project would temporarily increase traffic volumes on roadways in the area; however, the increase in traffic would not be substantial and a less than significant impact would result.	Less Than Significant	**Mitigation Measure 4.11-1:** No mitigation is required.	Not Applicable
Impact 4.11-2: Construction and operational traffic generated by the Proposed Project has	Less Than Significant	**Mitigation Measure 4.11-2:** No mitigation is required.	Not Applicable

Environmental Impact	Level of Significance Before Mitigation	Mitigation Measure	Level of Significance After Mitigation
the potential to result in inadequate emergency access.			
Impact 4.11-3: Traffic generated by construction and operation of the Proposed Project has the potential to impact pedestrian, bicycle, and public transport in the vicinity of the project.	Less Than Significant	**Mitigation Measure 4.11-3:** No mitigation is required.	Not Applicable

SECTION 3.0

PROJECT DESCRIPTION

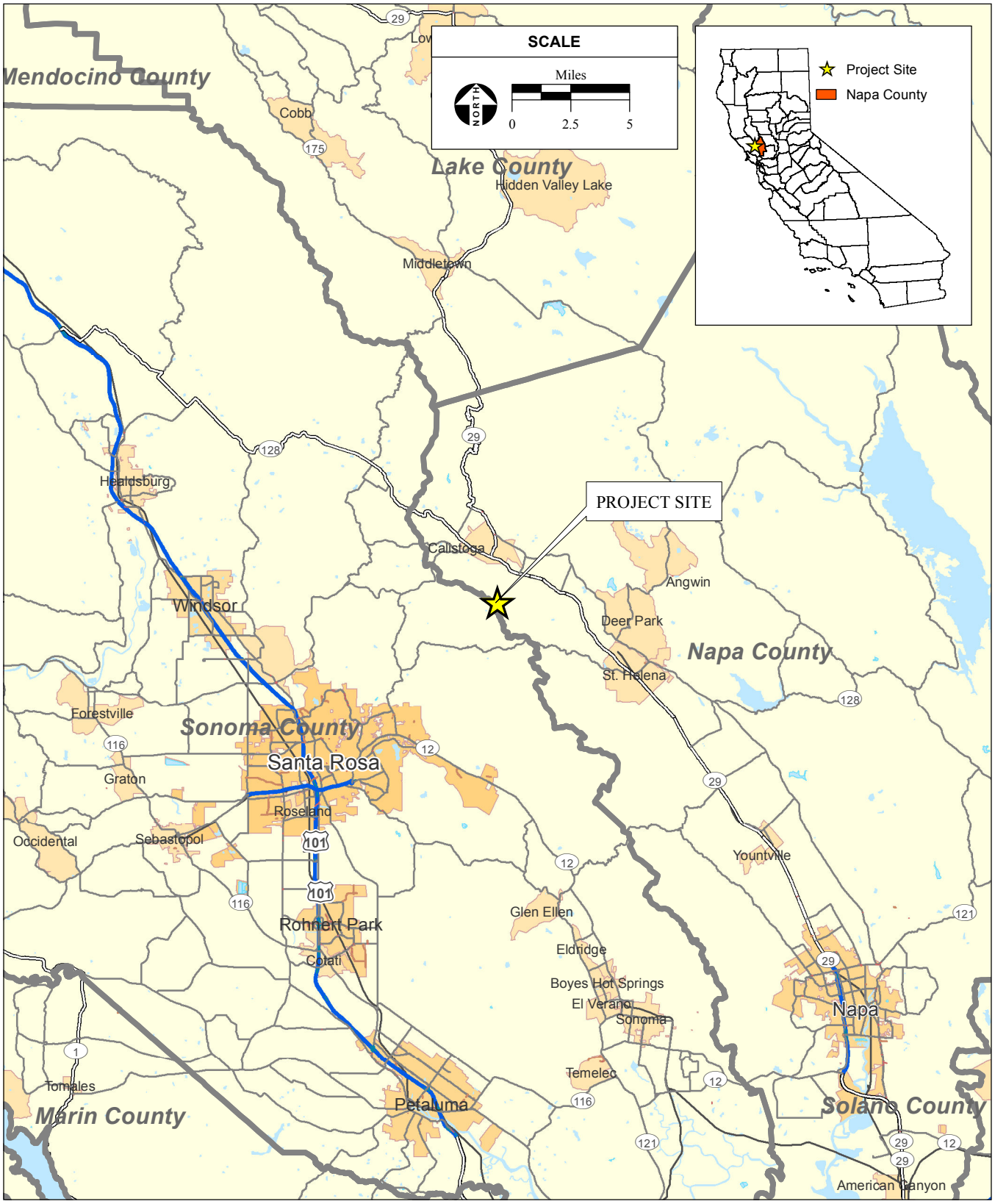
3.1 PROJECT LOCATION

The Jasud Estate Vineyards Timberland Conversion Project (Proposed Project) is located approximately two miles south of the town of Calistoga in northwest Napa County, California at 2087 Diamond Mountain Road off State Route (SR)-29. The property is situated within Section 18, Township 8 North, Range 6 West of the Mount Diablo Baseline and Meridian (MDBM) on the "Calistoga, California," U.S. Geological Society (USGS) 7.5-minute quadrangle (quad). The Proposed Project would occur entirely within Napa County assessor's parcel number (APN) 020-300-005, which totals 38± acres. The property is located within the 8,560-acre Simmons Creek watershed (Calwater 2206.500102). Onsite elevations range from approximately 1,560 to 1,900 feet above mean sea level with up to 42 percent slopes. **Figure 3-1** shows a map of the regional location of the property and **Figure 3-2** shows the site and vicinity. An aerial photograph of the property is included as **Figure 3-3**.

3.2 SITE AND VICINITY

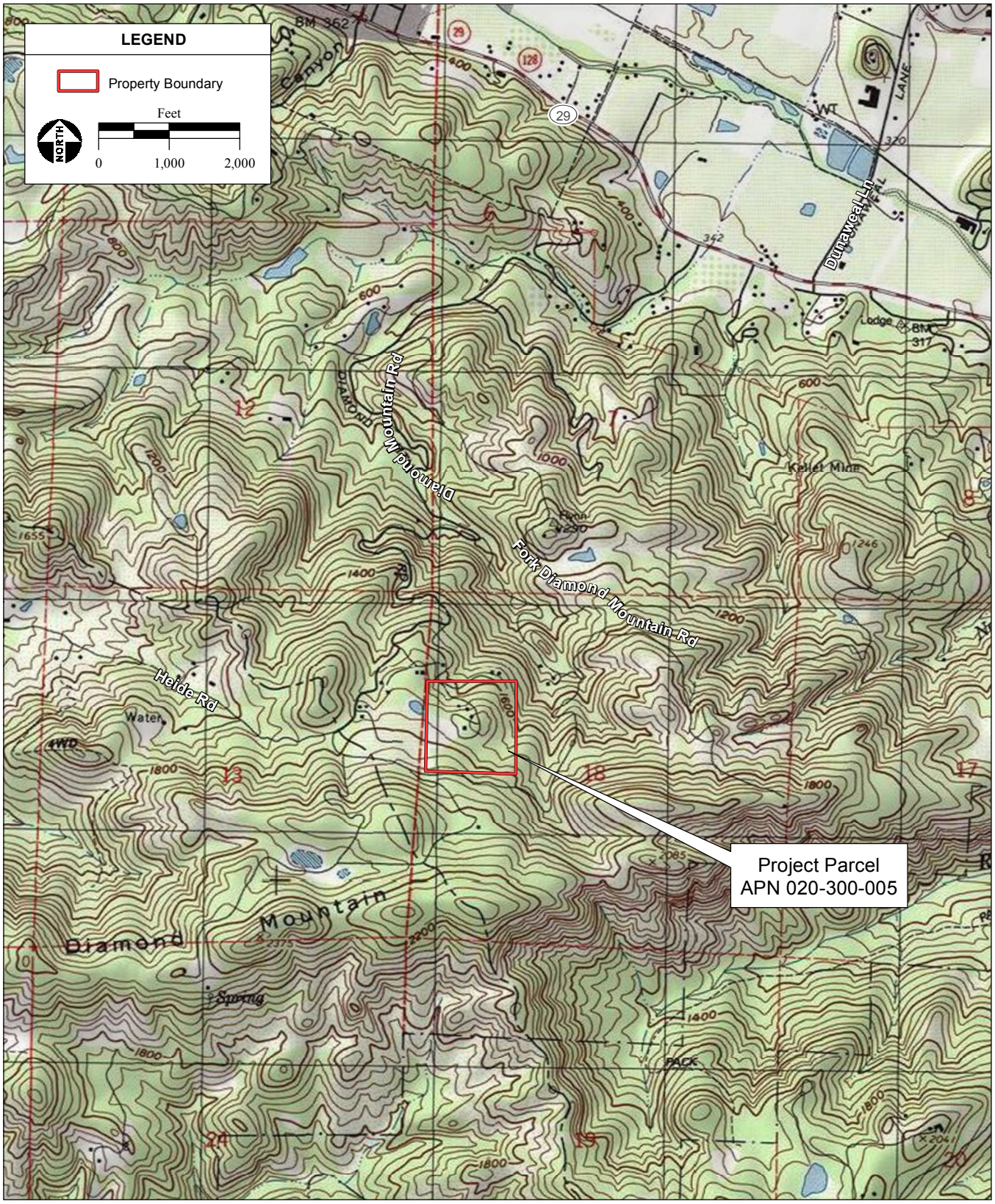
The property is situated on a southeast facing ridge near the border of Sonoma County in northwestern Napa County near the town of Calistoga. The property is located within the Kortum Canyon Creek watershed, a sub-watershed of the larger Simmons Creek watershed. The majority of the Kortum Canyon Creek watershed, including the subject property, is zoned as Agricultural Watershed (AW). The 1,852-acre Kortum Canyon Creek watershed is made up of approximately 915 acres (or 50 percent) forested land, portions of which may be subject to timbering activities, and approximately 452 acres (or 24 percent) agricultural land, which mostly consists of vineyards (Appendix U of **Appendix K**).

The Napa River is located to the northeast and Lake Hennessey is located to the southeast of the subject property. The property contains two Class III watercourses, one Class IV drainage, and a spring with adjacent wet area. Under the Proposed Project, these onsite water features would be protected by a Water and Lake Protection Zone (WLPZ). The vineyard footprint would be set back from these water features and no activities would take place within these setbacks.



SOURCE: StreetMap North America, 2009; AES, 2011

Figure 3-1
Regional Location



SOURCE: "Calistoga, CA" USGS 7.5 Minute Topographic Quadrangle,T8 R7W, Section 12, Mt. Diablo Baseline & Meridian; AES, 2011

Figure 3-2
Site and Vicinity

SOURCE: NAIP Aerial Photograph, 6/7/2009; ESRI Data, 2011; AES, 2011

Figure 3-3
Aerial Photograph

3.2.1 ONSITE WATER FEATURES

The following summary of onsite water features is taken from **Section 4.0**. Refer to **Section 4.0** for maps and further descriptions of the onsite water features described below.

Two unnamed, seasonal Class III watercourses occur in the northwest and southeast portions of the property. There is also a developed spring and adjacent wet area located in the southwest corner of the property. This developed spring has historically been used for agricultural and domestic purposes on the property. The spring area contains a spring box, a concrete cistern, and a wooden water tank (Origer, 2011). Both the cistern and water tank are currently not in operation. The spring is currently connected by above ground piping to a water storage tank approximately 540 feet to the northeast. Presently, overflow from the spring creates a wet area surrounding the spring site; however, water from the spring does not flow off the property. This spring and wet area would be protected by a minimum 50 foot buffer from any impacts from the Proposed Project. The wet area terminates before it meets the proposed farm avenue between vineyard blocks A and E, which is upslope of the beginnings of a Class III watercourse that forms in the northwest corner of the property and flows north before exiting the property boundary.

The northwest Class III watercourse forms approximately 50 feet north of the proposed vineyard avenue between proposed vineyard blocks A and E, where it then flows north (absent of a defined bed and bank) for approximately 150 feet whereby at this point it becomes channelized and is classified as a County designated drainage. After exiting the property to the north, this Class III drainage flows along Diamond Mountain Road to Kortum Canyon Creek. This watercourse has a protection zone of up to 85 feet on the west side and 35 feet on the east side of the drainage within the property, and would not be impacted by the Proposed Project.

The southeastern Class III watercourse on the property originates from an onsite spring and flows east, exiting the property and later combining off-site with the northwest Class III watercourse discussed above, which then flows to Kortum Canyon Creek and then to the Napa River. This watercourse has a 35 foot setback, as recommended by the registered professional forester (Environmental Resource Management), which exceeds the Forest Practice Rules recommended guidelines of 30 foot setbacks. This watercourse would not be impacted by the Proposed Project.

There is a Class IV drainage that occurs in the northwest corner of the property where its flow dissipates before it reaches the northern edge of proposed vineyard block A. This Class IV drainage, as defined by Cal Fire designations, does not meet Napa County's definition of a stream; therefore, setbacks are not defined for this drainage. This Class IV drainage is manmade as a result of improper drainage from offsite slopes, and thus, this improper drainage is corrected via the control measures in the ECP.

3.2.2 HISTORICAL USES ON THE PROPERTY

The property has been harvested for timber in the past and shows signs of succession and re-growth of shrubs and trees. There is one former residence site located in the center of the parcel and the remnants of a walnut orchard currently located in the southwest corner of the parcel; however, these areas are not included in the Proposed Project. Additional buildings on the parcel include a rustic cabin and farm outbuildings located on the northeastern portion of the parcel. These structures are located outside of the development envelope on the property and are also not included under the Proposed Project.

There is a former residence site in the center of the property outside of the proposed 12± acre vineyard within the 14± acre timber harvest area. This former residence site is not covered in the timber harvest impact area nor is it included under the ECP and vineyard conversion elements of the Proposed Project. The former residence site once contained associated out-buildings and a pool in the immediate vicinity, but all of these structures have been removed under a County demolition permit.

Additional information about the site and vicinity is provided in **Section 4.0** (Environmental Setting, Impacts and Mitigation Measures) of this EIR.

3.3 PROJECT OBJECTIVES

Approximately 14± acres of timberland would be harvested on the property under a Timber Harvest Plan (THP) and Timber Conversion Plan (TCP), consistent with Forest Practice Rules, and performed under a CEQA-equivalent process lead by the California Department of Forestry and Fire Protection (Cal Fire). The timber harvest would occur before the installation of the onsite erosion control plan (ECP) and vineyard conversion elements of the Proposed Project, which are the components of the project that trigger the preparation of this EIR under CEQA.

After the timber harvest occurs on the property, specific objectives associated with the Proposed Project are to:

- Convert 13.5± acres on the property within the 14± acre harvest area of the THP to other permanent uses;
- Install a 16.3± acre erosion control plan (ECP) on the property, which includes the harvested 14± acre area, improvements to an existing onsite road (1.3± acres), and remaining areas such as farm avenues for the vineyard;
- Develop a 12± acre biodynamic vineyard within the 13.5± acre converted area of the property; and

- Provide opportunities for vineyard employment and economic development in Napa County.

Sustainable project practices include:

- Farm vineyards in a sustainable manner under Biodynamic certification standards by *Demeter, USA*;
- Minimize soil erosion of vineyard development and operation through vineyard design that avoids erosion-prone areas and controls erosion within the vineyard rather than capturing soil after it has been displaced;
- Protect water quality by protecting existing wetlands and streams to the maximum extent feasible through avoidance, buffers, and the implementation of various drainage features;
- Make efficient use of water resources from an onsite spring to the degree needed to establish the vineyard, which would ultimately be dry farmed in the long term; and
- Preserve a large portion of the property (57 percent), which would remain as timber/woodlands and open space and as such these areas would have the greatest wildlife habitat value (refer to the County Conservation Regulations 48 and 50 described in the THP, **Appendix K**).

3.4 DESCRIPTION OF THE PROPOSED PROJECT

As described above, the precursor action to the Proposed Project includes the timber harvest and THP/TCP approvals, which are subject to Forest Practices Rules lead by Cal Fire. The Proposed Project consists of two direct elements: the conversion of timberland to vineyard and installation of the ECP. All of these actions effect the development of the Proposed Project on the property and would occur in the following order: 1) the separate harvest of 14± acres of timberland on the property, permitted separately under a THP/TCP approved by Cal Fire; 2) the conversion of 13.5± acres within the 14± acre harvested area to vineyard blocks; 3) the development of 12± acre vineyard within the conversion area; and 4) the implementation of a County-approved ECP, which is required per County guidelines for the vineyard development since onsite slopes exceed a 5 percent grade. The 16.3± acre ECP area generally includes the 14± acre harvested area, associated vineyard farm avenue areas, and 1.3± acres for erosion control improvements to an existing onsite entry road to the property (which is located outside of the timber harvest and proposed vineyard footprint). The precursor timber harvest phase, the installation of the ECP, and conversion to vineyard are analyzed under this EIR and are discussed in detail below.

3.4.1 TIMBER HARVEST ELEMENT

As stated above, 14± acres of timberland would be harvested on the property under a THP and TCP, consistent with Forest Practice Rules, and performed under a separate CEQA-equivalent process lead by Cal Fire. The timber harvest would occur before implementation of the vineyard conversion and installation of the ECP, which are the direct components of the Proposed Project subject to this EIR.

The property is not located within a Timberland Production Zone (TPZ); however, since the Proposed Project would result in the conversion of "non-TPZ timberland to a non-timber growing use" through timberland operations in which "future timber harvests will be prevented or infeasible because of land occupancy and activities thereon," a TCP and approval is also required from Cal Fire consistent with the Z'berg-Nejedly Forest Practice Act (Division 4, Chapter 8, Public Resources Code) and California Forest Practice Rules (Title 14, California Code of Regulations).

Cal Fire is the Lead Agency for the approval of the TCP and THP for the harvest of timber resources on the property. Avoidance and protective measures for natural and biological resources included in **Section 4.3** of this EIR are incorporated into the TCP and THP. The THP and TCP are included as **Appendix K** to this EIR. Due to the interrelated nature of these two Cal Fire approvals and the overlap of impact areas on the property, the THP and TCP will be discussed in this EIR to ensure that cumulative and indirect impacts to the property are fully analyzed (see **Section 6.0**).

All harvested timber would be processed on the property at a portable sawmill under the THP. Once processed, the material leaving the property would be limited to transport on three axle trucks and would not require the use of logging trucks. No new roads, except internal farm avenues within the new vineyard, would be built. All non-merchantable trees and vegetation would be removed, chipped and/or burned onsite, consistent with Napa County and Bay Area Air Quality Management District standards. Suitable forest products such as lumber, sawlogs, chips, etc. would be milled onsite and removed to be marketed as appropriate. Erosion control measures and site stabilization approved by Cal Fire would be incorporated into the precursor timber harvest phase to prevent erosion from the property (see **Section 3.4.3**).

In summary, the permanent conversion from timberland to other non-timberland uses on the property would total 13.5± acres, the majority of which would contain the proposed 12± acre vineyard and 1.5± acres for farm avenues under the Proposed Project. This permanent conversion would result in the removal of this land from use as timberland to use in agriculture. It should be noted that the County zoning designation for the property (Agricultural Watershed) is fully compatible with both the existing use as timberland (which includes timber harvesting practices) as well as the ultimate use of the property as a

vineyard and open space.

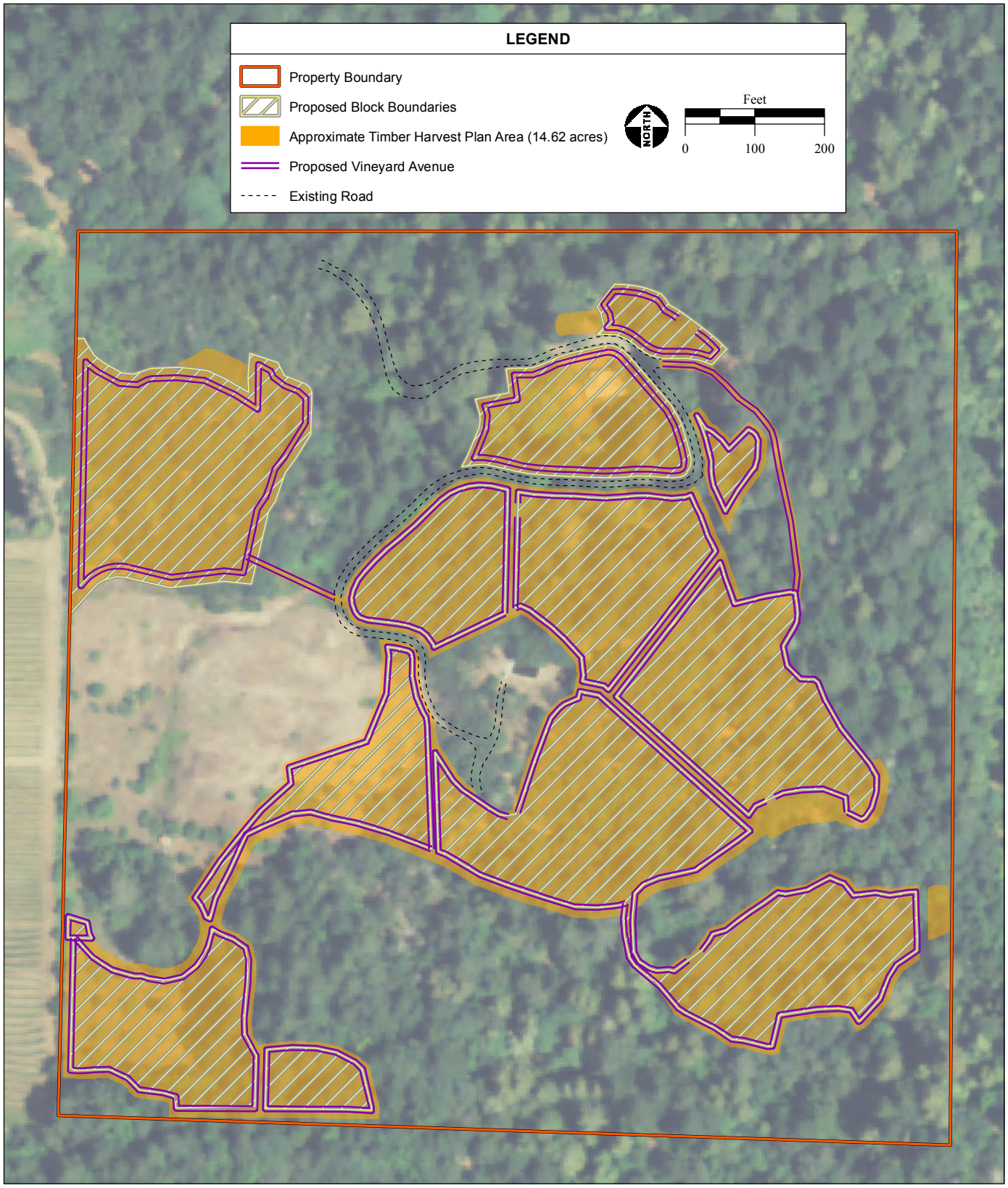
Under the THP, the actual logging impact area (harvest area) totals 14± acres. Eight additional trees would be selectively harvested on the property for personal use only per the terms of the THP (**Appendix K**). Under the THP, areas outside the harvest area identified as non-harvestable or open areas total 1.5± acres, which were classified as "non-timberland." The 1.5± acres of non-timberland are not subject to conversion on the property. Under the ECP, the proposed erosion control improvements to the existing onsite road total 1.3± acres on the property. **Figure 3-4a** shows the proposed cleared timber harvest area including the proposed boundaries of the vineyard blocks. The 13.5± acres for the proposed vineyard blocks and farm avenues fall within the 14± acre harvested area on the property as shown in **Figure 3-4a**.

3.4.2 EROSION CONTROL PLAN ELEMENT

An ECP (File #P10-00309-ECPA) has been prepared by a Licensed Civil Engineer (Napa Valley Vineyard Engineering) pursuant to Chapter 18.108 of the Napa County Code (Conservation Regulations). An ECP is required for agricultural projects involving grading and earthmoving activities on slopes over 5 percent in Napa County. Since 12± acres of the harvested area would be converted to vineyard, the ECP is applicable to this timber conversion action and is therefore part of this Proposed Project and analyzed in this EIR. In order to maximize the erosion control elements for the entire impacted area of the property, the proposed ECP features cover the entire 14± acre timber harvest area and the existing onsite road (1.3± acres) since this existing entrance road would be used to move equipment to and from the harvest area and could therefore be subject to erosion from project activities. The Napa County action of approving the ECP element of the Proposed Project is subject to CEQA; therefore, Napa County is the Responsible Agency for this EIR. As of August 18, 2011, the Napa County Resource Conservation District determined that the ECP meets all technical adequacy requirements. The complete ECP for the Proposed Project (#P10-00309-ECPA) is included as **Appendix B** (NVVE, 2011). **Figure 3-4b** shows the proposed vineyard blocks and **Figure 3-4c** highlights the erosion control features that would be installed on the property.

Erosion Control Measures

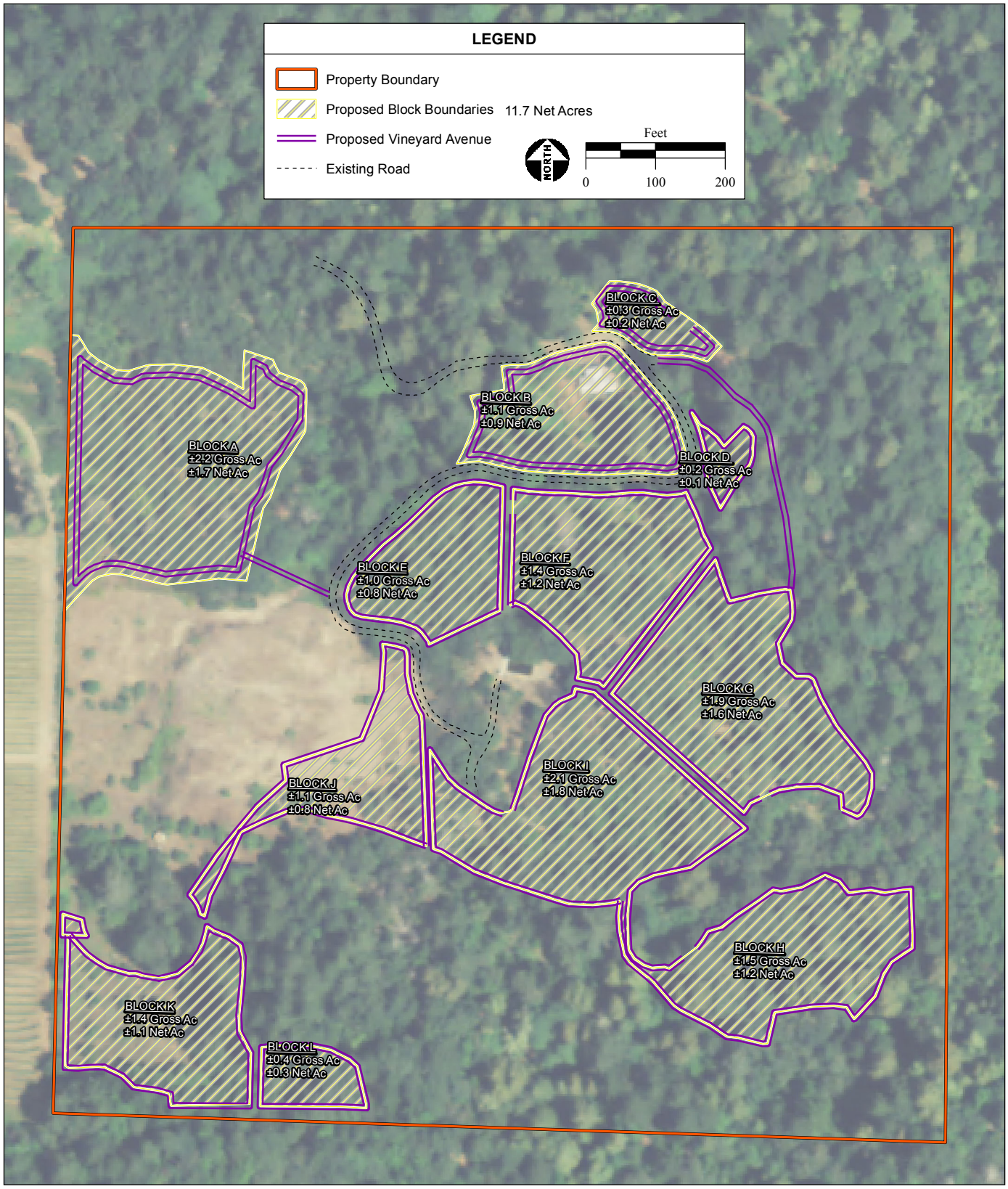
The ECP for the Proposed Project prescribes a permanent cover crop and non-tilled vineyard. Specific erosion control measures include but are not limited to: drainage collection ditches/vegetated swales, rock stabilization, straw waddles, rock slope protection, drop inlets to proposed piping, waterbars, permanent cover crops, water spreaders, detention structures, etc. Erosion control measures associated with the ECP, including the vineyard block areas, are briefly discussed below.



SOURCE: Napa Valley Vineyard Engineering, 9/2010; NAIP Aerial Photograph, 6/7/2009; AES, 2012

Figure 3-4a

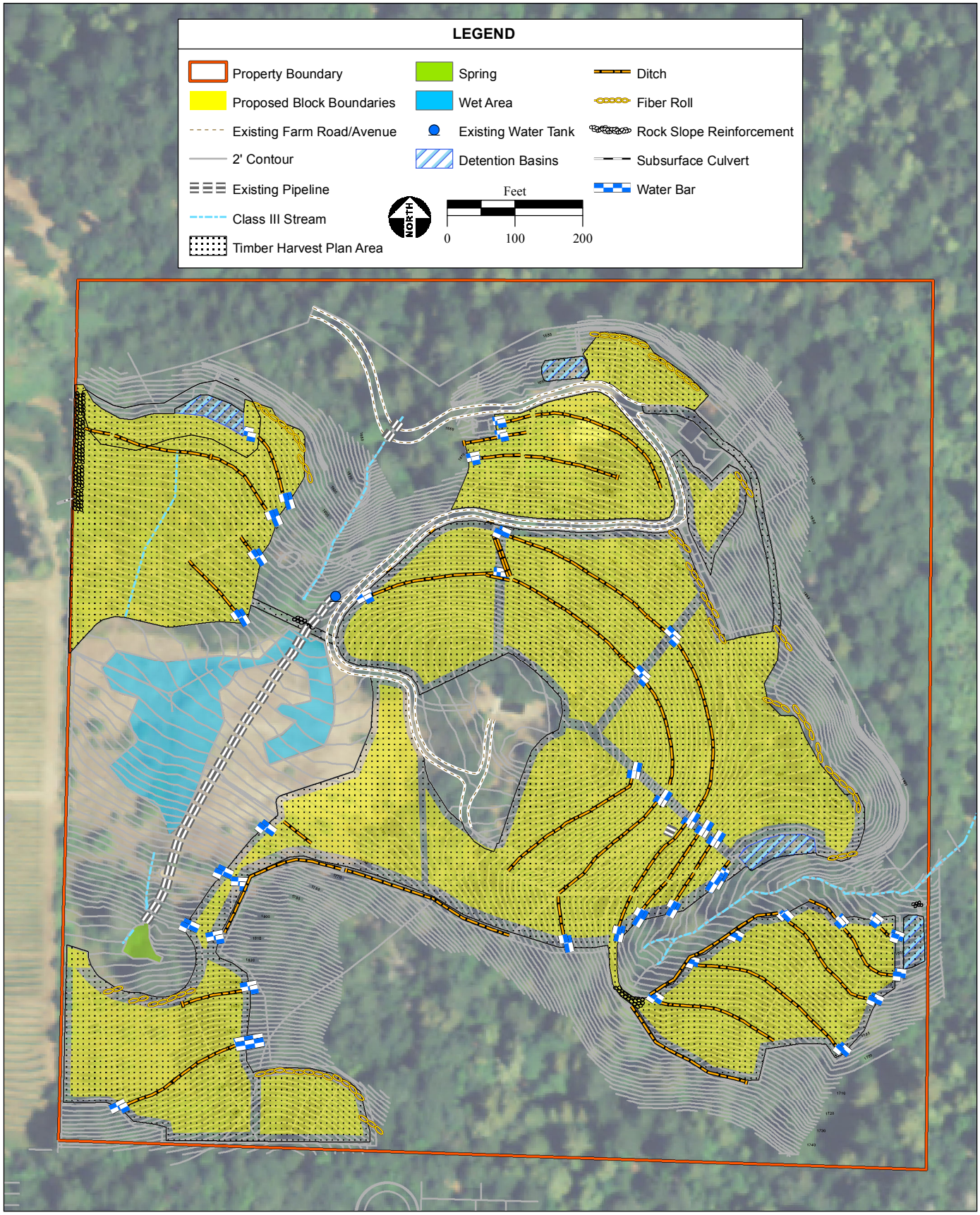
Timber Harvest Plan Area



SOURCE: Napa Valley Vineyard Engineering, 9/2010; NAIP Aerial Photograph, 6/7/2009; AES, 2011

Figure 3-4b

Proposed Vineyard Conversion



SOURCE: Napa Valley Vineyard Engineering, 9/2010; NAIP Aerial Photograph, 6/7/2009; AES, 2011

Figure 3-4c

Erosion Control Plan for Proposed Vineyard

Temporary Erosion Control Measures

Temporary erosion control measures consist of the installation of fiber rolls, and the application of straw mulch. The installation of all fiber rolls shall be completed in accordance with the appropriate details at all locations as shown on the plan sheet (refer to **Appendix B**).

Permanent Erosion Control Measures

Permanent erosion control measures include, but are not limited to, the following:

1) Construction of water bars where appropriate.
2) Construction of rock stabilization where appropriate.
3) Grading of diversion ditches and installation of drop inlets and water spreaders where appropriate.
4) Construction of four (4) detention basins as shown on the ECP (**Appendix B**) and in accordance with specifications and details.
5) A temporary winter cover crop that shall be planted within the new vineyard area and other disturbed areas. A ground cover of 85 percent or greater would be the target of each of the first two winters' plantings (**Appendix B**).

Runoff Collection System

Surface drainage ditches (vegetated swales) would be created throughout the vineyard blocks to collect normal surface runoff at low points of the vineyard and to transport it to drop inlets, which would then flow into subsurface pipelines and ultimately into one of the four onsite detention basins. The vegetated swales and detention basins would ensure that the velocity of flow of runoff from the vineyard areas is reduced, is temporarily held onsite, is largely filtered (via settling action) in the basins, and that before ultimately leaving the property total runoff levels do not exceed preconstruction flows (**Appendix B**).

Additional diversion features would be constructed in various locations throughout the proposed vineyard area in order to prevent erosion from large concentrations of surface flows. These features include straw mulch, fiber rolls, and rock stabilization (positioned where needed as diverted flows cross over farm avenues). The placement of detention basins, water bars, and water spreaders would be designed to ensure that the water leaving the detention basins forms as sheet flow and is slow enough as not to cause erosion as it enters the undisturbed areas of the property and eventually flows into the existing onsite stream courses which naturally drain the site (**Appendix B**).

There would be four detention basins constructed at the periphery of vineyard blocks A, C, G, and H (see **Figures 3-4b** and **3-4c**). These detention basins would serve to retard the flow of water leaving the impacted areas of the site and serve as sediment traps that would be shaped to fit the existing topography. Each detention basin would contain an emergency

spillway approximately 10 feet wide and 12 inches deep and a 12-inch outlet pipe (**Appendix B**). Water spreaders would be installed at the ends of the proposed detention basin outflows in order to ensure that the water leaving the basins is sheet flow (**Figure 3-4c**; **Appendix B**).

Implementation Schedule for the ECP

After the 14± acres of timberland is harvested and prior to installation of the vineyard, the ECP components would be installed on the property prior to the start of the rainy season (October 15). Planting year operations for the vineyard may be conducted over one or two growing seasons.

3.4.3 VINEYARD CONVERSION ELEMENT

Layout and installation

The proposed vineyard areas would consist of 12 vineyard blocks ranging in size from 0.1 to 1.7 net acres. Vineyard/farm avenues would be constructed around each block, resulting in gross acreages for each of the 12 blocks ranging from 0.2 to 2.2 gross acres. Vine rows would be planted approximately four feet apart. All disturbed areas would be planted with a vegetative cover crop, with cover maintained at approximately 85 percent (**Appendix B**). **Table 3-1** shows the estimated acreage for the proposed vineyard.

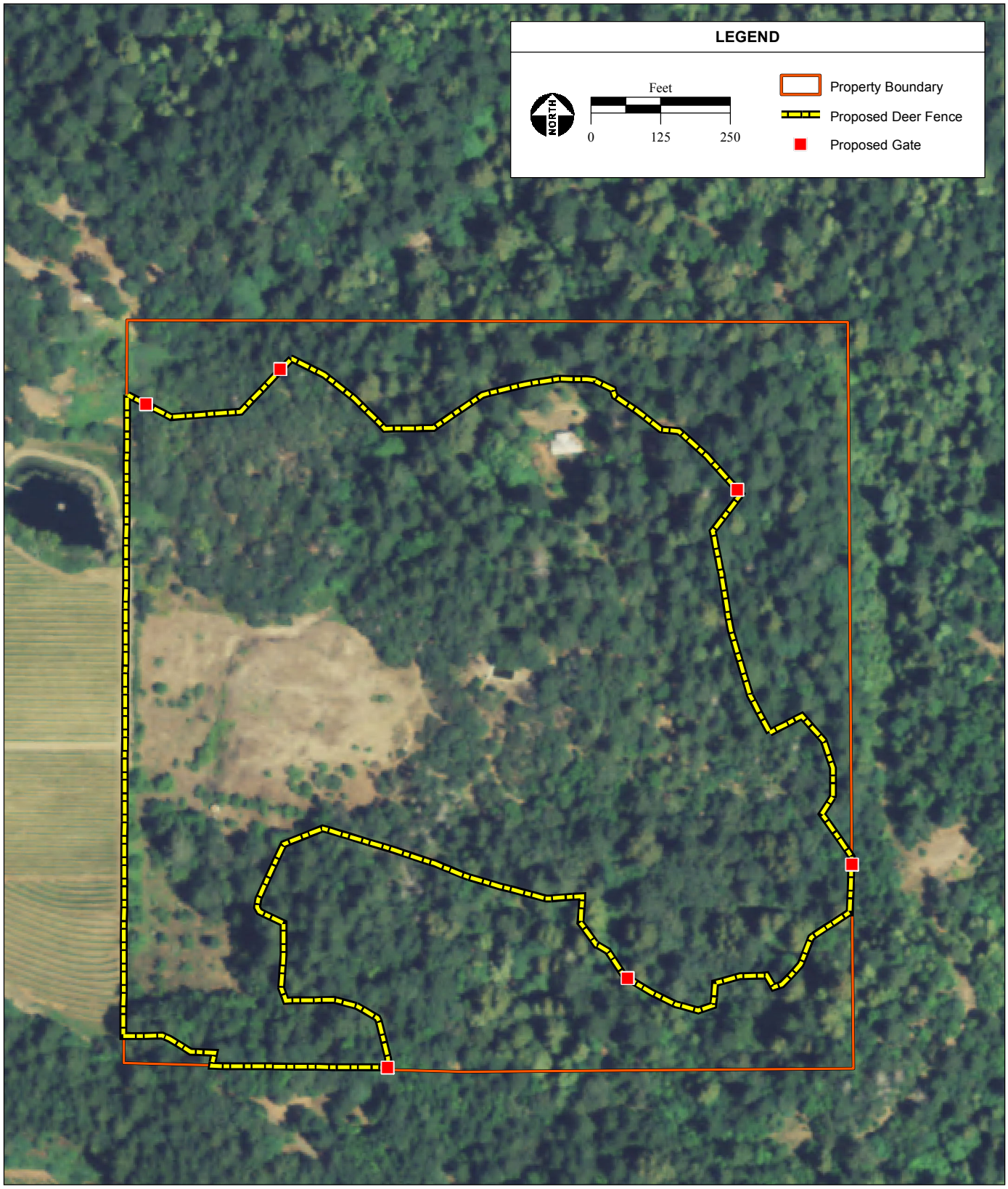
TABLE 3-1
ACREAGE OF PROPOSED VINEYARD BLOCKS

Proposed Vineyard Block	Net Acreage	Gross Acreage
A	1.7	2.2
B	0.9	1.1
C	0.2	0.3
D	0.1	0.2
E	0.8	1.0
F	1.2	1.4
G	1.6	1.9
H	1.2	1.5
I	1.8	2.1
J	0.8	1.1
K	1.1	1.4
L	0.3	0.4
Total	***11.7***	***14.6***

Source: NVVE, 2011

The existing vegetation on the property today within the 14± acre timber harvest area would be removed with the implementation of the THP and further impacted by the installation of the vineyard and the ECP.

Deer fencing is proposed to be installed to encompass the vineyard blocks with exit doors (gates) at the corners for safe removal of trapped wildlife, as detailed in **Figure 3-5**.



SOURCE: Napa Valley Vineyard Engineering, 9/2010; NAIP Aerial Photograph, 6/7/2009; AES, 2011

Figure 3-5

Proposed Deer Fencing

However, as summarized in the Biological Resources Report, no significant wildlife corridors would be impacted by the Proposed Project (refer to **Section 3.5**; **Appendix D**).

Vineyard Operation and Maintenance

Once developed, the Applicant intends to certify the vineyard as a Biodynamic farm through *Demeter, USA*. The proposed Biodynamic vineyard would be hand farmed and non-tilled. Operation and maintenance of the vineyard would include: pruning; pest, disease and weed control; mowing; vine management; irrigation; fertilization; and harvesting activities. Practices would be employed that rely on integrated pest management techniques and the use of the least environmentally impactful materials for management of diseases and pests as a last resort. The use of non-chemical and minimalist chemical practices would be the first line of defense against pests and diseases in the Proposed Project. Should the situation arise where a more intrusive technique or material is required, all other avenues for a non-chemical approach would be exhausted first. Further details on pest management and vineyard operation are presented in a report on the use of sustainable pest management practices for the Proposed Project included as **Appendix L**. Any application of chemicals would be done in accordance with the registration and under the guidance of a pesticide control advisor (PCA).

There is one existing water storage tank on the property, located down slope of the developed spring and connected by a 2 inch above-ground pipe that runs north through the wet area, which is adjacent to the spring (see **Figure 3-4c**). This water storage tank would be replaced or upgraded as part of the Proposed Project. The onsite spring which is already connected to the onsite water storage tank would meet the water supply requirements for the establishment of the vineyard. It is anticipated that a maximum of 4± acre-feet of water per year (afa) would be required for the first few years during the establishment of the vineyard. After establishment, the proposed vineyard would be dry farmed. The ongoing proposed water source for the vineyard is the existing spring. This spring has historically been used for both agricultural and domestic purposes. Spring flow was measured in 2009 to be approximately 8 gallons per minute (gpm) (K. Mody, pers comm. as noted in O'Connor Environmental Inc., 2011). Eight gallons per minute is equivalent to approximately 4.24 acre-feet of flow for a 120 day growing season; 4.24 acre-feet is expected to be adequate to meet the water demand of the developing vineyard (O'Connor Environmental Inc., 2011). Typical irrigation rates in Napa County are between 0.2 and 0.5 acre-feet/yr, which for the proposed 12± acres of vineyard equates to between 2.42 and 6.05 acre-feet of irrigation per growing season. The flow from the spring is in the midrange of typical irrigation rates.

Construction, Equipment, and Duration

Construction of the proposed vineyard is anticipated to occur over the first two years, with construction/planting occurring only during the dry months. The typical construction hours would be 7 A.M. to 5 P.M. Monday through Friday. Sufficient equipment, labor, and

materials would be committed and transported to the property prior to the commencement of construction to complete construction during each season. Once equipment is transported to the property it would remain there until implementation during that season is completed. The timber harvest and post-harvest site stabilization and erosion control under the ECP is anticipated to occur in the first year. Most of the actual vineyard installation and planting would occur in the second year. Construction will require about three workers during each phase of the project (including the precursor THP phase), the installation of the ECP features, and the planting and operation of the vineyard. The equipment proposed and materials/equipment deliveries anticipated for the timber harvest, ECP installation, and vineyard installation is provided in **Table 3-2** below.

TABLE 3-2
TYPICAL CONSTRUCTION ELEMENTS AND EQUIPMENT

Precursor Action: Timber Harvest	
I. Equipment*	**Quantity**
Excavator	1
Crawler Tractor	1
Grader	1
Skidder	1
Dump truck	1
Log loader	1
II. Vehicle Trips	**Duration/Amount**
Heavy Equipment Transport	12 trips (maximum per year)
Material Deliveries	Up to 12 **
Proposed Project: Erosion Control Plan Installation	
I. Equipment*	**Quantity**
Excavator	1
Crawler Tractor	1
Grader	1
Dump truck	1
II. Vehicle Trips	**Duration/Amount**
Heavy Equipment Transport	8 trips (maximum per year)
Material Deliveries	Up to 20 **
Proposed Project: Vineyard Installation	
I. Equipment*	**Quantity**
Excavator	1
Crawler Tractor	1
Grader	1
Dump truck	1
II. Vehicle Trips	**Duration/Amount**
Heavy Equipment Transport	8 trips (maximum per year)
Material Deliveries	Up to 40 **

Notes:
* Equipment per day is based on 8 hours, 20 days per month usage.
** Material Deliveries include materials necessary for the operation and installation of the THP, ECP and Vineyard such as culverts, straw, drip irrigation, vines etc.
Source: Environmental Resource Management, 2011

REFERENCES

Environmental Resource Management, 2011. Vineyard Development Information. July 7, 2011.

Napa Valley Vineyard Engineering (NVVE), 2011. Jasud Estate LLC, Jasud Estate Vineyard Erosion Control Plan for New Vineyard. Revision 3. Dated August 17, 2011.

O'Connor Environmental Inc. (OEI), 2011. Jasud Estate Vineyard Water Balance Assessment. July 2011.

Origer, 2011. A Cultural Resources Survey for the Jasud Estate LLC, Napa County, CA. Prepared by Tom Origer and Associates, April 12, 2011.

SECTION 4.0

ENVIRONMENTAL SETTING, IMPACTS AND MITIGATION MEASURES

4.1 AGRICULTURE AND FORESTRY RESOURCES

4.1.1 SETTING

As stated in **Section 3.0 Project Description**, the property occurs within Napa County assessor's parcel number (APN) 020-300-005, which totals approximately 38 acres. The property is zoned as Agricultural Watershed (AW) district (Napa County, 2011a). As stated in the Napa County Code of Ordinances:

> *"The AW district classification is intended to be applied in those areas of the county where the predominant use is agriculturally oriented, where watershed areas, reservoirs and floodplain tributaries are located, where development would adversely impact on all such uses, and where the protection of agriculture, watersheds and floodplain tributaries from fire, pollution and erosion is essential to the general health, safety and welfare (Napa County, 2011b)."*

Agricultural use, such as timber harvesting and vineyard production, is a permitted use under this designation (Appendix D of **Appendix K**). Generally, permitted uses under the AW designation include, but are not limited to, the following (Napa County, 2011b):

- Agriculture, including but not limited to, as defined in Section 18.08.040 as: (a) growing and raising trees, vines, shrubs, berries, vegetables, nursery stock, hay, grain, and similar food crops and fiber crops, and (d) sale of agricultural products grown, raised, or produces on the premises;
- One single-family dwelling unit per legal lot;
- A second unit, either attached to or detached from an existing legal residential dwelling unit, providing that all of the conditions set forth in Section 18.104.180 are met (Napa County, 2011c); and
- Wineries and related accessory uses which have been authorized by use permit and used in a manner set forth in Section 18.124.080 or any predecessor section; provided, that no expansion of uses or structures beyond those which were authorized by a use permit or modification of a use permit issued prior to the effective date of the ordinance codified in this chapter shall be permitted except as may be authorized by a subsequent use permit issued pursuant to this title (Napa County, 2011d).

4.1.2 REGULATORY FRAMEWORK

4.1.2-1 FEDERAL

Farmland Protection Policy Act

The Farmland Protection Policy Act (FPPA) is intended to minimize the impact federal programs have on the unnecessary and irreversible conversion of farmland to nonagricultural uses. It assures that federal programs are administered in a matter that is compatible with state and local units of government, as well as private programs and policies to protect farmland (7 U.S.C. § 4201).

The Natural Resource Conservation Service (NRCS), responsible for the implementation of the FPPA, categorizes farmland in a number of ways. These categories include: prime farmland, farmland of statewide importance, and unique farmland. Prime farmland is considered to have the best possible features to sustain long-term productivity. Farmland of statewide importance includes farmland similar to prime farmland but with minor shortcomings, such as greater slopes or less ability to retain soil moisture. Unique farmland is characterized by inferior soils and it generally requires irrigation depending on the climate.

4.1.2-2 STATE

California Farmland Mapping and Monitoring Program (FMMP)

The FMMP, which monitors the conversion of the state's farmland to and from agricultural use, was established by the California Department of Conservation, under the Division of Land Resource Protection. The program maintains an inventory of state agricultural land and updates its "Important Farmland Series Maps" every two years. The FMMP is an informational service only and does not constitute state regulation of local land use decisions.

The four categories of farmland defined under FMMP include: Prime Farmland, Farmland of Statewide Importance, Unique Farmland, and Farmland of Local Importance, which are considered valuable and any conversion of land within these categories is typically considered to be an adverse impact. The Department of Conservation provides the following definitions for the categories of farmland:

> **Prime Farmland**: Farmland with the best combination of physical and chemical features able to sustain long term agricultural production. This land has the soil quality, growing season, and moisture supply needed to produce sustained high yields. The land must have been used for irrigated agricultural production at some time during the four years prior to the mapping date.

Farmland of Statewide Importance: Farmland with a good combination of physical and chemical features but with minor shortcomings such as greater slopes or a lesser ability to hold and store moisture.

Grazing land: Land on which the existing vegetation is suited to the grazing of livestock.

Figure 4.1-1 shows the FMMP designations in the Proposed Project vicinity.

Williamson Act

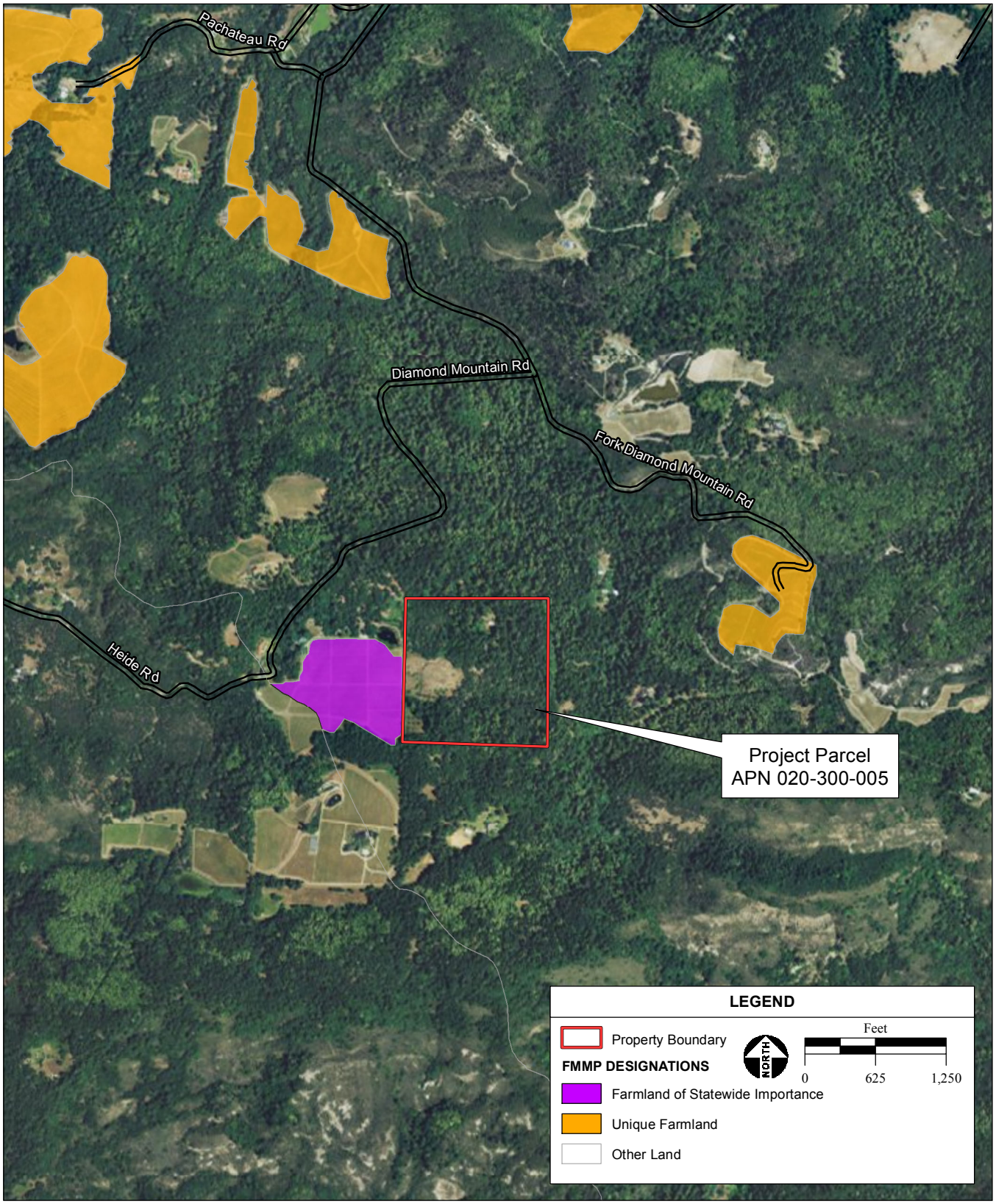
The Williamson Act is a state program that was implemented to preserve agricultural land. Under the provisions of the Williamson Act (California Land Conservation Act 1965, Section 51200), landowners contract with the county to maintain agricultural or open space use of their lands in return for reduced property tax assessments. The Williamson Act contract is self-renewing; however, the landowner may notify the county at any time of intent to withdraw the land from its preserve status. Withdrawal from a Williamson Act contract involves a ten-year period of tax adjustment to full market value before protected agricultural/open space land can be converted to urban uses (Department of Conservation, 2008). In extraordinary situations, immediate termination is sometimes granted. No portion of the subject property for the Proposed Project is under Williamson Act contract.

California Land Evaluation and Site Assessment

The California Land Evaluation and Site Assessment (LESA) is a numeric rating system to evaluate the relative value of agricultural land resources. The LESA is composed of two separate sets of factors; Land Evaluation and Site Assessment. Land Evaluation measures the natural quality of the soil in the area in relation to agricultural suitability, while Site Assessment measures social, economic, and geographic attributes in relation to agriculture. These specific factors include soil resource quality, project size, water resource availability, surrounding agricultural lands, and surrounding protected resource lands (Department of Conservation, 1997).

Z'berg-Nejedly Forest Practice Act

The Z'berg-Nejedly Forest Practice Act (Forest Practice Act) was enacted in 1973 to ensure that logging is done in a manner that will preserve and protect fish, wildlife, forests, and streams (Cal Fire, 2011). The California Department of Forestry and Fire Protection (Cal Fire) has enforcement responsibility for the Forest Practice Act. Additionally, Cal Fire has enacted Forest Practice Rules. The purpose of the Forest Practice Rules is to implement the provisions of the Forest Practice Act in a manner consistent with other laws, including but not limited to, the Timberland Productivity Act of 1982, CEQA, the Porter Cologne Water Quality Act, and the California Endangered Species Act (Cal Fire, 2011).



SOURCE: CA Dept. of Conservation, Farmland Mapping and Monitoring Program, 2006,2008;
NAIP Aerial Photograph, 6/7/2009; AES, 2011

Figure 4.1-1

Farmland Mapping and Monitoring Program Designations

4.1.2-3 LOCAL

Napa County

Agriculture and agricultural production are prevalent land uses in Napa County. Fertile valley and foothill areas have been identified by Napa County as areas where agriculture should continue to be the predominant land use. The Napa County General Plan provides the goal of planning for agriculture and related activities as the primary land uses in the County while concentrating urban uses within existing cities and urban areas (Goals 1 and 2) (Napa County, 2008). Napa County considers the development of urban uses outside of urbanized areas as detrimental to agriculture and the maintenance of open spaces, which are uses defined as economic and aesthetic attributes and assets of the County (Napa County, 2008).

The Agricultural Preservation and Land Use Element of the Napa County General Plan provides the following policies related to agricultural practices:

Policy AG/LU-1: Agriculture and related activities are the primary land uses in Napa County.

Policy AG/LU-3: The County's planning concepts and zoning standards shall be designed to minimize conflicts arising from encroachment of urban uses into agricultural areas.

Policy AG/LU-4: The County will reserve agricultural lands for agricultural use including lands used for grazing, except for those lands which are shown on the Land Use Map as planned for urban development.

Additionally, as stated in the Napa County General Plan, the County has approximately 40,000 acres of land that contains commercial timber species (Napa County, 2008). Most of the County's timberland is located in five areas (in descending order): the Western Mountains, the Eastern Mountains, Livermore Ranch, Pope Valley, and Angwin. Most timber harvesting in Napa County is a one-time cutting of forests and the conversion of timberlands into other uses, such as vineyards. However, a limited amount of sustainable yield timber harvesting does take place in the County. As stated above, timber harvest is considered a compatible agricultural use of the subject property for the Proposed Project under the current zoning designation of AW.

The Agricultural Preservation and Land Use Element and the Conservation Element of the Napa County General Plan provide the following policies related to forestry practices:

Policy AG/LU-18: Timber production areas in the County shall be considered to be those defined in the most recent adopted mapping available from Cal Fire unless local areas are defined through a public planning process.

Policy CON-1: The County will preserve land for greenbelts, forest, recreation, flood control, adequate water supply, air quality improvement, habitat for fish, wildlife and wildlife movement, native vegetation, and natural beauty. The County will encourage management of these areas in ways that promote wildlife habitat renewal, diversification, and protection.

Policy CON-35: The County shall encourage active forest management practices to preserve and maintain existing forests and timberland, allowing for their economic and beneficial use.

4.1.3 IMPACTS ANALYSIS

4.1.3-1 SIGNIFICANCE CRITERIA

Criteria for determining the significance of impacts to agricultural resources have been developed based on Appendix G of the CEQA *Guidelines*. For the purposes of this analysis, the Proposed Project would have a significant impact if it would:

- Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the FMMP of the California Resources Agency, to non-agricultural use;
- Conflict with existing zoning for agricultural use, or a Williamson Act contract;
- Conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code section 12220(g)), timberland (as defined by Public Resources Code section 4526), or timberland zoned Timberland Production (as defined by Government Code section 51104(g));
- Result in the loss of forest land or conversion of forest land to non-forest use; or
- Involve other changes in the existing environment which, due to their location or nature, could result in conversion of farmland to non-agricultural use or conversion of forest land to non-forest use.

4.1.3-2 IMPACTS AND MITIGATION MEASURES

Impact 4.1-1: The Proposed Project would result in the loss of forest land through conversion of forest land to non-forest use.

The property is currently zoned as AW, which includes agricultural purposes such as timber harvest and vineyard. Though the farmland directly adjacent to the property's western boundary is designated as Farmland of Statewide Importance, the property itself is not currently designated under the FMMP. Upon implementation of the Proposed Project, the property would continue to be used for agricultural purposes (vineyards) and would not result in converting Prime Farmland, Unique Farmland, or Farmland of Statewide

Importance to non-agricultural uses. The Proposed Project would not conflict with existing zoning in the County's General Plan, or cause rezoning of forest land nor would it conflict with an existing Williamson Act contract.

The property is not located within a Timberland Production Zone (TPZ); however, the Proposed Project would convert non-TPZ timberland to a non-timber growing use. Therefore, a Timber Harvest Plan (THP) and Timber Conversion Plan (TCP) is required for the timber harvest action as stated in **Section 3.0**. The Proposed Project would result in the permanent conversion of forest land. However, the property is not located within the commercial forest land base of California. The THP for the Proposed Project (**Appendix K**), states that since the Proposed Project would result in the removal of 14± acres (37 percent) of the property, which is a relatively small amount of timber volume, and since it is not located within the commercial forest land base of California, no significant impact can be expected to occur on timber resources of the state or the state's timber productivity and economy (Appendix U of **Appendix K**). Further, with implementation of mitigation to offset tree loss discussed in **Section 4.3 Biological Resources**, impacts to loss of forest land would be considered less than significant. A cumulative impact analysis of the Proposed Project on Agriculture and Forestry Resources is provided in **Section 6.0**.

Mitigation Measure 4.1-1: No further mitigation is required.

REFERENCES

California Department of Conservation (Department of Conservation), 1997. California Agricultural Land Evaluation and Site Assessment Model. Instruction Manual. Available online at: http://www.consrv.ca.gov/DLRP/LESA/lesamodl.pdf. Accessed July 15, 2011.

Department of Conservation, 2008. Farmland Mapping and Monitoring Program. Napa County Important Farmland 2008. Available online at: ftp://ftp.consrv.ca.gov/pub/dlrp/FMMP/pdf/2008/nap08.pdf. Accessed October 13, 2011.

California Department of Forestry and Fire Protection (Cal Fire), 2011. California Forest Practice Rules. 2011. Title 14, California Code of Regulations. Available online at: http://www.fire.ca.gov/resource_mgt/downloads/2011_FP_Rulebook_with_Diagrams_with_Tech_Rule_No_1.pdf. Accessed July 15, 2011.

Napa County, 2008. *Napa County General Plan.* June 3, 2008. Available online at: http://www.countyofnapa.org/Pages/DepartmentDocuments.aspx?id=4294970192. Accessed July 14, 2011.

Napa County, 2011a. Parcel Information for Assessor's Parcel Number 020300005000. *My Property*. Available online at: http://services.countyofnapa.org/MyProperty/ParcelDetail.aspx?parcel=020300005000. Accessed on July 15, 2011.

Napa County, 2011b. Agricultural Watershed District. *Napa County Zoning Ordinance. Title 18, Napa County Code.* Napa County Conservation, Development and Planning Department. Available online at: http://library.municode.com/HTML/16513/level2/TIT18ZO_CH18.20AWAGWADI.html Accessed July 14, 2011.

Napa County, 2011c. Section 18.104.180: Second unit attached to or detached from an existing dwelling. Available online at: http://library.municode.com/HTML/16513/level2/TIT18ZO_CH18.104ADZODIRE.html#TIT18ZO_CH18.104ADZODIRE_18.104.180SEUNATDEEXDW. Accessed July 15, 2011.

Napa County, 2011d. Section 18.124.080: Automatic expiration of use permits. Available online at:

http://library.municode.com/HTML/16513/level2/TIT18ZO_CH18.124USPE.html#TIT18ZO_CH18.124USPE_18.124.080AUEXUSPE. Accessed July 15, 2011.

4.2 AIR QUALITY

4.2.1 SETTING

The primary factors that determine air quality are the locations of air pollutant sources and the amounts of pollutants emitted. Meteorological and topographical conditions, however, are important. Atmospheric conditions such as wind speed, wind direction, and air temperature gradients interact with the physical features of the landscape to determine the movement and dispersal of air pollutants.

The Proposed Project is located approximately two miles south of the City of Calistoga in Napa County, California. The property is situated within the northwestern end of the Napa Valley. Napa Valley is a long, narrow valley running north to south between two ridges formed within the coastal mountains that have an average ridgeline height of about 2,000 feet. Some peaks in the valley approach 3,000 to 4,000 feet in height. Up-valley winds (from the south during the day) and down-valley winds (from the north during the night) result because of the surrounding terrain. Topography in the County is defined by the Napa Valley and surrounding upland areas, which contain smaller valleys.

Napa Valley has a high potential for natural air pollution due to diminished ventilation caused by the terrain. Locally and regionally generated pollutants can be transported by the prevailing winds northward into the Napa Valley often trapping and concentrating the pollutants under stable conditions. The local up-valley and down-valley flows shaped by the surrounding mountains may also re-circulate pollutants, contributing to a buildup of pollutants. Napa Valley generally has good air quality due to relatively little development across much of the valley despite its natural predisposition for air pollution.

4.2.1-1 SENSITIVE RECEPTORS

Some receptors are considered more sensitive than others to air pollutants. Some reasons for increased sensitivity include a person's pre-existing health problems, proximity to the emissions source, or duration of exposure to air pollutants. Land uses such as schools, hospitals, and convalescent homes are considered to be sensitive to poor air quality. This is because infants and children, the elderly, and people with health afflictions (especially respiratory ailments) are more susceptible to respiratory infections and other air-quality-related health problems than the general public. Residential areas are also considered to be sensitive to air pollution, because residents (including children and the elderly) tend to be at home for extended periods of time, resulting in sustained exposure to any pollutants present.

There are no occupied residences located on the property; however, there are several scattered residences located within the vicinity of the property. These residences are mainly

located to the west or east of the property. The nearest residence is located approximately 380 feet west of the property. There are no schools or hospitals in the vicinity of the property.

4.2.1-2 CRITERIA AIR POLLUTANTS

Criteria Air Pollutants (CAPs) are common pollutants that have been identified by the U.S. Environmental Protection Agency (EPA) and the California EPA as being detrimental to human health. CAPs are used as indicators of regional air quality. The EPA has designated six CAPs: ozone (O_3), carbon monoxide (CO), particulate matter (PM), nitrogen dioxide (NO_2), sulfur dioxide (SO_2), and lead (Pb). The California EPA adds four additional CAPs: hydrogen sulfide, sulfates, visibility reducing particles, and vinyl chloride. The following CAPs are of special concern in Napa County, because the County is designated as non-attainment for the following pollutants:

Ozone (O3)

Photochemical reactions involving reactive organic gases (ROG) and oxides of nitrogen (NO_X) resulting from the incomplete combustion of fossil fuels are the largest source of ground-level O_3. Because photochemical reaction rates depend on the intensity of ultraviolet light and air temperature, ozone is primarily a summer air pollution problem. As a photochemical pollutant, O_3 is formed only during daylight hours under appropriate conditions, but is destroyed throughout the day and night. O_3 is considered a regional pollutant, as the forming reaction occurs over time downwind from the sources of the emissions.

Particulate Matter (PM_{10} and $PM_{2.5}$)

Particle pollution is a mixture of microscopic solids and liquid droplets suspended in air. This pollution, also known as particulate matter, is made up of a number of components, including acids (such as nitrates and sulfates), organic chemicals, metals, soil or dust particles, and allergens (such as fragments of pollen or mold spores). The size of particles is directly linked to their potential for causing health problems. Small particles less than 10 micrometers (µm) in diameter pose the greatest problems, because they can travel deep into lungs (PM_{10}) and the bloodstream ($PM_{2.5}$). Exposure to such particles can affect the lungs and heart. Larger particles are of less concern, although they can irritate the eyes, nose, and throat.

4.2.2 REGULATORY FRAMEWORK

4.2.2-1 PLANS, POLICIES, AND STANDARDS

Regulation of air pollution is achieved through both national and state ambient air quality standards and emission limits for individual sources of air pollutants. As required by the Federal Clean Air Act (FCAA), the EPA has identified "criteria pollutants" and established National Ambient Air Quality Standards (NAAQS) to protect public health and welfare. NAAQS have been established for O_3, CO, NO_x, SO_2, PM_{10}, $PM_{2.5}$, and Pb.

California has adopted more stringent ambient air quality standards for most of the criteria air pollutants (referred to as California Ambient Air Quality Standards or CAAQS). Because of the unique meteorological conditions in California, there is considerable diversity between the CAAQS and NAAQS currently in effect in California. **Table 4.2-1** presents both state and national standards.

TABLE 4.2-1
CALIFORNIA AND NATIONAL AMBIENT AIR QUALITY STANDARDS

Pollutant	Averaging Time	CAAQS	NAAQS[b]
Ozone (O_3)	1 hour 8 hour	0.09 ppm 0.070 ppm	N/A 0.075 ppm
Carbon Monoxide (CO)	1 hour 8 hour	20 ppm 9.0 ppm	35 ppm 9 ppm
Nitrogen Dioxide (NO_2)	1 hour Annual Mean	0.25 ppm N/A	N/A 0.053 ppm
Sulfur Dioxide (SO_2)	1 hour 3 hour 24 hour Annual Mean	0.25 ppm N/A 0.04 ppm N/A	N/A 0.5 ppm[1] 0.14 ppm 0.030 ppm
Respirable Particulate Matter (PM_{10})	24 hour Annual Mean	50 $\mu g/m^3$[c] 20 $\mu g/m^3$	150 $\mu g/m^3$ N/A
Fine Particulate Matter ($PM_{2.5}$)	24 hour Annual Mean	N/A 12 $\mu g/m^3$	35 $\mu g/m^3$ 15 $\mu g/m^3$
Sulfates	24 hour	25 $\mu g/m^3$	N/A
Lead (Pb)	30 day Calendar Quarter	1.5 $\mu g/m^3$ N/A	N/A 1.5 $\mu g/m^3$
Hydrogen Sulfide	1 hour	0.03 ppm	N/A
Visibility Reducing Particles	8 hour	0.23 per kilometer	N/A
Vinyl Chloride	24 hour	0.010 ppm	N/A

Notes: ppm = parts per million by volume; $\mu g/m^3$= micrograms per cubic meter.
N/A=Not Applicable
[1] Secondary Standard.
Source: CARB, 2010a

Under amendments to the FCAA, the EPA has classified air basins, or portions thereof, as either “attainment” or “non-attainment” for each criteria air pollutant, based on whether or not the NAAQS have been achieved. In 1988, the State legislature passed the California Clean Air Act (CCAA), which is patterned after the FCAA to the extent that it also requires areas to be designated as “attainment” or “non-attainment”, but with respect to the CAAQS rather than the NAAQS. Thus, areas in California have two sets of attainment/non-attainment designations for each criteria pollutant: one set with respect to the national standards and one set with respect to the State standards.

The FCAA also requires non-attainment areas to prepare air quality plans that include strategies for achieving attainment. Air quality plans developed to meet the NAAQS are referred to as State Implementation Plans (SIPs). The CCAA also requires plans for non-attainment areas (except for PM_{10}) with respect to the State standards. Thus, just as areas in California have two sets of designations, many also have two sets of planning requirements; one to meet federal requirements relative to the NAAQS and one to meet requirements relative to the CAAQS.

The EPA is responsible for implementing the myriad programs established under the FCAA, such as establishing and reviewing the national ambient air quality standards and judging the adequacy of SIPs, but has delegated the authority to implement many of the federal programs to the states while retaining an oversight role to ensure that the programs continue to be implemented.

The California Air Resources Board (CARB), California’s state air quality management agency, regulates mobile emissions sources and oversees the activities of regional/county air districts. CARB is responsible for establishing emissions standards for on-road motor vehicles sold in California. The Bay Area Air Quality Management District (BAAQMD) is the regional agency empowered to regulate air pollutant emissions from stationary sources in the Bay Area. Both agencies regulate air quality though their permit authority and through their planning and review activities.

4.2.2-2 AIR QUALITY DATA

Under the NAAQS, the Bay Area is currently designated as a non-attainment area for 8-hour O_3 and $PM_{2.5}$ and is designated maintenance for CO. Under the CAAQS, the Bay Area is designated as a non-attainment area for O_3, PM_{10}, and $PM_{2.5}$ (BAAQMD, 2011).

CARB maintains several ambient air quality monitoring stations within the BAAQMD that provide information on the average concentrations of criteria air pollutants in the region. Monitored ambient air pollutant concentrations reflect the number and strength of emissions sources and the influence of topographical and meteorological factors. The closest

monitoring station to the property is located in the City of Napa, at Jefferson Street near Central Avenue, about five miles southwest of the property. It should be noted that the monitoring station is located in an urban area while the property is located in a relatively rural area. **Table 4.2-2** presents a three-year summary of ambient air quality monitoring data from the Napa station and compares ambient air pollutant concentrations of O_3, $PM_{2.5}$, and PM_{10} to CAAQS and NAAQS.

TABLE 4.2-2
AIR QUALITY DATA SUMMARY FOR NAPA VALLEY 2008-2010

Pollutant/Standard	Standard	Days Standard Exceeded[1] in:		
		2008	2009	2010
O_3	Federal 8-Hour	2	1	2
O_3	State 8-Hour	2	3	2
O_3	State 1-Hour	1	1	1
PM_{10}	State 24-Hour	0	1	0
$PM_{2.5}$	State 24-Hour	*	*	*

[1] An exceedance is not necessarily a violation.
* Insufficient Data.
Source: CARB, 2010b

The ambient air quality standards were not met at the monitoring location according to the NAAQS for 8-hour O_3 in 2008 and 2009, the CAAQS for 1- and 8-hour O_3 in 2008 and 2009, or the CAAQS for 24-hour PM_{10} in 2009 as shown in **Table 4.2-2**.

4.2.3 IMPACTS ANALYSIS

This air quality analysis includes a qualitative discussion of expected emissions generated from sources such as timber harvesting, log hauling, and construction activities, including grading activities. This analysis also includes calculations of operational emissions from project initiation to buildout of the Proposed Project.

4.2.3-1 SIGNIFICANCE CRITERIA

For the purposes of this analysis, the Proposed Project would have a significant impact if it would:

- Conflict with or obstruct implementation of the applicable air quality plan;
- Violate any ambient 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 in non-attainment;
- Expose sensitive receptors to substantial pollutant concentrations; or
- Create objectionable odors affecting a substantial number of people.

For construction and operational related emissions of criteria air pollutants, the 2010 BAAQMD California Environmental Quality Act (CEQA) *Guidelines* provide a 54 pounds per day (ppd) threshold for NO_x, ROG, and $PM_{2.5}$ and a 82 ppd threshold for PM_{10}. The BAAQMD CEQA Guidelines also require that basic construction mitigation measures, which are outlined in the guidance document, be implemented (BAAQMD, 2010).

4.2.3-2 IMPACTS AND MITIGATION MEASURES

Impact 4.2-1: During construction, the timber harvest, land clearing, earthmoving, movement of vehicles, and wind erosion of exposed soil associated with implementation of the Proposed Project would have the potential to cause nuisance related to fugitive dust and exceedance of applicable BAAQMD thresholds for criteria pollutants. This is a potentially significant impact.

Conversion of the existing landscape to vineyard requires clearing of vegetation and earthmoving activities, which would expose bare soil to wind erosion, thereby generating fugitive dust. Earthmoving activities would be performed by heavy duty construction equipment, which would emit NO_x, ROG, $PM_{2.5}$, and PM_{10} emissions. The property is located in a rural area with few sensitive receptors; nevertheless, site preparation activities would have the potential to cause air quality impacts to the area.

The BAAQMD-approved Urban Emissions (URBEMIS) 2007 model (Version 9.2.4), which estimates air pollution emissions from a wide variety of land use projects, was used to estimate the projected emissions from the Proposed Project during construction. For the purposes of the URBEMIS model, it was assumed that construction would only occur during the five-month dry season of each year, and that construction would be completed over the course of one dry season. Default values for typical construction equipment were used, and the total gross area of disturbed land was assumed to be 14± acres, within the timber harvest area on the property. Projected emissions from construction of the Proposed Project are presented in **Table 4.2-3** below; URBEMIS output files are provided in **Appendix C**.

TABLE 4.2-3
MITIGATED (UNMIGATED) CONSTRUCTION EMISSIONS FROM VINEYARD INSTALLATION

Construction Year	ROG	NO_x	PM_{10}	$PM_{2.5}$
	Pounds per Day			
2012	6.57 (6.57)	38.00 (55.53)	2.95 (12.61)	1.54 (4.48)
BAAQMD Significance Thresholds	*54*	*54*	*82*	*54*
Threshold Exceeded	***No (No)***	***No (Yes)***	***No (No)***	***No (No)***

Note: Approximate mitigated emissions shown, parenthesis indicate unmitigated emissions.
Sources: URBEMIS, 2007; AES, 2011.

Onsite mulching would be the primary method used for the removal of vegetated material; however, in the event burning is done onsite burning of cleared vegetation would occur during land preparation and during the wet season as permitted by the governing agencies and in accordance with the BAAQMD Regulation 5 (BAAQMD, 2006). As seen in **Table 4.2-3**, the Proposed Project would not exceed any BAAQMD threshold.

Mitigation Measure 4.2-1: The Applicant shall implement a fugitive dust abatement program during the construction of #P10-00309-ECPA, which shall include the following elements:

- Cover all trucks hauling soil, sand, and other loose materials or require all trucks to maintain at least two feet of freeboard.
- Cover all exposed stockpiles.
- Sweep streets daily (with water sweepers) if visible soil material is carried onto adjacent paved streets.
- Limit traffic speeds on unpaved roads to 15 miles per hour (mph).
- Suspend excavation and grading activity when winds (instantaneous gusts) exceed 25 mph.

In addition to the above measures, the Applicant shall also implement the required basic construction mitigation measures as recommended by the BAAQMD during the construction of the Proposed Project, which shall include the following elements:

- All exposed surfaces (e.g., parking areas, staging areas, and unpaved access roads) shall be watered as needed to ensure dust abatement.
- Idling times shall be minimized either by shutting equipment off when not in use or reducing the maximum idling time to five minutes (as required by the California airborne toxics control measure Title 13, Section 2485 of the California Code of Regulations [CCR]). Clear signage shall be provided for construction workers at all access points.
- All construction equipment shall be maintained and properly tuned in accordance with manufacturer's specifications. All equipment shall be checked by a certified mechanic and determined to be running in proper condition prior to operation.
- Post a publicly visible sign with the telephone number and person to contact at the Lead Agency regarding dust complaints. This person shall respond and take corrective action within 48 hours. The Air District's phone number shall also be visible to ensure compliance with applicable regulations.
- All heavy duty construction equipment shall be fitted with diesel particulate matter filters and use only aqueous diesel fuel.

The measures above are in addition to the permanent erosion control measures specified in #P10-00309-ECPA, which include establishing a permanent no till cover crop on all disturbed areas. As shown in **Table 4.2-3** construction of the Proposed Project would not exceed the BAAQMD criteria pollutant threshold. The permanent erosion control measures would avoid the creation of nuisance dust and PM_{10} during operation of the Proposed Project, which would reduce these potentially significant impacts to a less than significant level.

Impact 4.2-2: Operation of the Proposed Project would attract additional vehicles to the property, resulting in new regional emissions; however, new emissions would not be substantial and a less than significant impact would result.

Maximum operational mobile and area source emissions would occur during the grape harvest season for the proposed vineyard. An estimated 10 one-way employee trips would occur during this season, with a one-way trip length of approximately 35 miles. Given the scale of the project, it is estimated that grape trucks would make an additional five one-way trips per day during the harvest period; with a one-way trip length of approximately 35 miles. Air quality modeling was performed for the Proposed Project using the URBEMIS 2007 (Version 9.2.4) air quality modeling program, output files are provided in **Appendix C**. URBEMIS estimated the employee and truck trip emissions associated with operation of the Proposed Project. **Table 4.2-4** shows the operational emissions from employee and grape haul trips associated with the Proposed Project, and compares the total emissions for the Proposed Project to the BAAQMD thresholds.

TABLE 4.2-4
OPERATIONAL INCREASE IN EMISSIONS FROM VINEYARD CONVERSION

Source	ROG	NOx	PM_{10}	$PM_{2.5}$
	Pounds per Day			
Area Sources	0.12	0.02	0.01	0.01
Mobile Sources	0.68	0.89	1.80	0.34
Total Operational Emissions	0.80	0.91	1.81	0.35
BAAQMD Significance Thresholds	54	54	82	54
Threshold Exceeded	***No***	***No***	***No***	***No***

Sources: URBEMIS, 2007; AES, 2011.

The Proposed Project would not exceed the BAAQMD thresholds of significance; therefore, air quality impacts due to operation are less than significant.

Mitigation Measure 4.2-2: No mitigation is required.

Impact 4.2-3: Construction of the Proposed Project would slightly increase traffic volumes and congestion levels on local roadways, resulting in changes to CO concentrations;

however, changes in CO concentrations would not be substantial and a less than significant impact would result.

The Proposed Project is in a designated maintenance area for CO; the Napa Valley region has relatively low background levels of CO compared to other parts of the Bay Area. CO disperses rapidly into the atmosphere, which makes it a local pollutant. High concentrations of CO from vehicles generally occur when a large number of vehicles are idling for more than 35 seconds; this generally occurs at signaled intersections with large volumes of traffic (greater than 10,000 vehicles per hour). There are no intersections in the project vicinity that would meet this criteria. Idling of construction equipment on-site has the potential to exacerbate CO concentrations near the property; however, there are no sensitive receptors near the property and with the implementation of **Mitigation Measure 4.2-1** above CO concentrations from construction would be reduced. Therefore, the Proposed Project's effect on CO concentrations during construction is a less than significant impact.

Mitigation Measure 4.2-3: No mitigation is required.

Impact 4.2-4: Project emissions have the potential to cause distress to sensitive receptors. However, project-related emissions would not be substantial and a less than significant impact would result.

Some receptors are considered more sensitive than others to air pollutants as discussed in **Section 4.2.1-1** above. Construction emissions are temporary and the BAAQMD states that if PM_{10} is mitigated, no NAAQS or CAAQS would be violated (see also **Impact** and **Mitigation Measure 4.2-1** above). The Proposed Project includes development of approximately 12 gross acres of vineyard and disturbed areas; the property is designated as Agriculture Watershed under the Napa County General Plan. The surrounding area consists mainly of open space, forested areas, and agricultural lands. Operational emissions would not increase significantly with the Proposed Project and would not exceed BAAQMD significance thresholds (see **Table 4.2-4**). There are also no schools, hospitals or convalescent homes located close enough to the property that would be affected by construction or operational emissions from the Proposed Project; the closest off-site residence is located between approximately 380 feet west from the property boundary. Potential distress to sensitive receptors is a less than significant impact.

Mitigation Measure 4.2-4: No mitigation is required.

Impact 4.2-5: Project operation could result in operational odors. However, odors from operation would not be substantial and a less than significant impact would result.

During installation of #P10-00309-ECPA and subsequent vineyard operations, various diesel-powered vehicles and equipment used on the property would create odors. However, these sources are mobile and transient in nature, and the distance of approximately 380 feet to the nearest off-site residence would provide for dilution of odor-producing constituent emissions. These odors would dissipate rapidly and are temporary. Because of this, and the distance between the property and the nearest sensitive receptor, odors from vehicles and equipment are unlikely to be noticeable beyond the area of operation. The proposed vineyard would be managed as Biodynamic without chemical treatments. However, other odors that may be generated during project operation include the potential application of wettable sulfur and sulfur dust to control mildew. These odors would be temporary and would occur at a substantial distance from rural receptors (greater than 400 feet from the nearest offsite receptors). This is a less than significant impact.

Mitigation Measure 4.2-5: No mitigation is required.

REFERENCES

Analytical Environmental Services (AES), 2011. *URBEMIS 2007 Detail Report*. July 22, 2011.

Bay Area Air Quality Management District (BAAQMD), 2010. *California Environmental Quality Act: Air Quality Guidelines.* Prepared by the Bay Area Air Quality Management District. Available online at: http://www.baaqmd.gov/~/media/Files/Planning%20and%20Research/CEQA/BAAQMD%20CEQA%20Guidelines_June%202010.ashx. June 2010. Accessed July 19, 2011.

BAAQMD, 2006. Open Burn Status and Regulation 5. Available online at: http://www.baaqmd.gov/tec/openburn.htm. Accessed July 20, 2011.

BAAQMD, 2011. Ambient Air Quality Standards. Prepared by the BAAQMD. Available online at: http://hank.baaqmd.gov/pln/air_quality/ambient_air_quality.htm. Updated 2011. Accessed July 19, 2011.

California Air Resources Board (CARB), 2010a. Ambient Air Quality Standards. Prepared by the California Air Resources Board. Available online at: http://www.arb.ca.gov/research/aaqs/aaqs2.pdf. Updated September 8, 2010. Accessed September 30, 2010.

CARB, 2010b. California Air Resources Board Aerometric Data Analysis and Management (ADAM), Top 4 Summary. Available online at: http://arb.ca.gov/adam/topfour/topfour1.php. Accessed July 21, 2011.

Urban Emissions (URBEMIS), 2007. Air quality emissions modeling program. Available online at: http://www.urbemis.com/.

4.3 BIOLOGICAL RESOURCES

4.3.1 METHODOLOGY

4.3.1-1 FIELD SURVEYS

Field surveys were performed by Kjeldsen Biological Consulting in support of the biological studies of the property on February 28, March 16, April 26, May 19, 24, June 15, July 12, 2010 and September 20, 2011. In addition, Analytical Environmental Services (AES) Botanist Laura Burris and Registered Professional Forester Scott Butler (Environmental Resource Management) conducted a site survey on August 29, 2011 to ground truth biological findings documented in the Biological Resources Report (see Supplemental Biological Survey Memorandum under **Appendix D**). Surveys of the property were conducted on foot and representative areas of all the vegetation communities and wildlife habitats were examined and refined via mapping (refer to **Appendix D**). Vegetation communities on the property were characterized by the dominant species present and amount of cover of the uppermost canopy layer, according to the *Manual of California Vegetation, Second Edition* (MCV) (Sawyer et al., 2009). Vegetation communities in the field were mapped on an aerial photograph of the property (**Section 4.3.3**).

Because the purpose of the field surveys was to determine potential impacts of the Proposed Project to onsite biological resources, the field surveys focused most intently on areas within vineyard block clearing limits and other proposed development features. The 16.3± acre ECP area, which encompasses the footprints of the timber harvest (14± acres), vineyard conversion area (13.5 ± acres) and proposed vineyard (12± acres) was used as the focus area for this biological study. Due to the overlap of the impact area, potential impacts to biological resources analyzed in this section include impacts from both the precursor timber harvest and development of the vineyard and installation of the ECP under the Proposed Project.

4.3.2 REGULATORY FRAMEWORK

4.3.2-1 SPECIAL STATUS SPECIES

Federal Endangered Species Act

The USFWS and NMFS implement the Federal Endangered Species Act (FESA) of 1973 (16 USC Section 1531 *et seq*.). Threatened and endangered species on the federal list (50 CFR Subsection 17.11, 17.12) are protected from “take” (direct or indirect harm), unless a Section 10 Permit is granted to an individual or a Section 7 consultation and a Biological Opinion with incidental take provisions are rendered to a lead federal agency. Pursuant to the requirements of FESA, an agency reviewing a proposed project within its jurisdiction must determine whether any federally listed species may be present in the project area and

determine whether the proposed project would have a potentially significant impact upon such species.

Critical habitat is defined under the FESA as specific geographic areas within a listed species range that contain features considered essential for the conservation of the listed species. Designated critical habitat for a given species may not necessarily be currently occupied by that species if it is within the historic range of the species and supports habitat deemed by the USFWS to be important for the recovery of the species. Critical habitat designation applies only to federal actions or actions funded or permitted by federal agencies. If a federal action or an action allowed by federal funding or a federal permit has the potential to adversely affect critical habitat for a listed species, the responsible federal agency is required to consult with the USFWS or NMFS. Under FESA, habitat loss is considered to be an impact to the species. In addition, the agency is required to determine whether the project is likely to jeopardize the continued existence of any species proposed to be listed under FESA or result in the destruction or adverse modification of critical habitat proposed to be designated for such species (16 USC Section 1536 (3), (4)). Therefore, project-related impacts to these species, or their habitats, would be considered significant and would require mitigation. The USFWS also designates species of concern. Species of concern receive attention from federal agencies during environmental review, although they are not otherwise protected under FESA. Project-related impacts to such species would also be considered significant and would require mitigation.

The property for the Proposed Project does not contain Critical Habitat for federally listed species.

California Endangered Species Act

The CDFG implements state regulations pertaining to fish and wildlife and their habitat. The California Endangered Species Act (CESA) of 1970 (California Fish and Game (CFG) Code Section 2050 *et seq*., and CCR Title 14, Subsection 670.2, 670.51) prohibits the take (interpreted to mean the direct killing of a species) of species listed under CESA (14 CCR Subsection 670.2, 670.5). A CESA permit must be obtained if a proposed project would result in the take of listed species, either during construction or over the life of the project.

California Environmental Quality Act (CEQA) Guidelines Section 15380

Although threatened and endangered species are protected by specific federal and state statutes, CEQA *Guidelines* Section 15380(b) and (d) provides that a species not listed on the federal or state list of protected species may be considered rare or endangered if the species can be shown to meet certain specified criteria. These criteria have been modeled after the definition of FESA and the section of the CFG Code dealing with rare or endangered plants or animals. This section was included in the guidelines primarily to deal with situations in which a public agency is reviewing a project that may have a significant

effect on, for example, a candidate species that has not yet been listed by the USFWS or a species recognized as being of special concern by the CDFG. Thus, CEQA provides the ability to protect a species from potential impacts until the respective government agencies have an opportunity to designate the species as protected, if warranted.

California Fish and Game Codes

The California Fish and Game Code defines take (Section 86) and prohibits taking of a species listed as threatened or endangered under the CESA (California Fish and Game Code Section 2080), or otherwise fully protected (California Fish and Game Code Sections 3511, 4700, and 5050). Section 2081(b) and (c) of the CESA allows the California Department of Fish and Game (CDFG) to issue an incidental take permit for a state listed threatened and endangered species if specific criteria outlined in Title 14 CCR, Sections 783.4(a), (b) and California Fish and Game Code Section 2081(b) are met. The California Fish and Game Code Section 3503 states that it is unlawful to take, possess, or needlessly destroy the nest or eggs of any bird, except as otherwise provided by the code. Section 3503.5 states that it is unlawful to take, possess, or destroy any birds in the order Falconiformes or Strigiformes (birds of prey) or to take, possess, or destroy the nest or eggs of any such bird. Section 3513 states that it is unlawful to take or possess any migratory nongame bird as designated in the MBTA or any part of such migratory nongame bird except as provided by rules and regulations adopted by the Secretary of the Interior under provisions of the MBTA. If a project is planned in an area where a species or specified bird occurs, an applicant must design the project to avoid all take of nonlisted migratory birds; the CDFG cannot provide take authorization under the CESA. The CDFG protects plants designated as endangered or rare under Fish and Game Code Section 1900.

Migratory Bird Treaty Act

Most bird species, especially those that are breeding, migrating, or of limited distribution, are protected under federal and state regulations. Under the Migratory Bird Treaty Act of 1918 (16 USC Subsection 703-712), migratory bird species and their nests and eggs are protected from injury or death. Project-related disturbances must be reduced or eliminated during the nesting cycle. CFG Code Subsections 3503, 3503.5, and 3800 prohibit the possession, incidental take, or needless destruction of birds, their nests, and eggs. CFG Code Section 3511 list birds that are “fully protected”, which identifies those species that may not be taken or possessed except under specific permit. Bald and golden eagles are protected by the Migratory Bird Treaty Act and the Bald and Golden Eagle Protection Act. These Acts require some measures to continue to prevent bald eagle “take” resulting from human activities.

California Native Plant Protection Act

The California Native Plant Protection (CNPP) Act of 1977 (CFG Code Section 1900 *et seq*.)

requires CDFG to establish criteria for determining if a species or variety of native plant is endangered or rare. As a result, CDFG maintains a "special plants" list consisting of approximately 2,000 native plant species, subspecies, or varieties that are tracked by the California Natural Diversity Database (CNDDB). In addition, the CNPS maintains inventories of native flora of California and ranks species according to rarity (CNPS, 2010); List 1 plants are presumed extinct in California, List 1B plants rare or endangered in California and elsewhere, and List 2 plants rare or endangered in California, but more common elsewhere. As stated on the CDFG website, “plants on Lists 1A, 1B, and 2 of the CNPS inventory consist of plants that may qualify for listing, and the CDFG recommends they be addressed in CEQA projects (CEQA Guidelines Section 15380)” (CDFG, 2012).

Oak Woodlands Conservation Act

The Oak Woodlands Conservation Act (California State Senate Bill 1334) became law on January 1, 2005 and was added to the CEQA statutes as 21083.4. This act requires that a county must determine whether or not a project would result in a significant impact on oak woodlands. If it is determined that a project may result in a significant impact on oak woodlands, then one or more of the following mitigation measures are required:

1) Conserve oak woodlands through the use of conservation easements;
2) Plant an appropriate number of trees, including maintenance of plantings and replacement of failed plantings;
3) Contribute funds to the Oak Woodlands Conservation Fund for the purpose of purchasing oak woodlands conservation easements; and
4) Other mitigation measures developed by the county.

4.3.2-2 WETLANDS AND OTHER WATERS OF THE U.S.

Any project that involves working in navigable waters of the U.S., including the discharge of dredged or fill material, must first obtain authorization from the U.S. Army Corps of Engineers (USACE), under Section 404 of the Clean Water Act. The CDFG requires notification prior to commencement, and possibly a Lake or Streambed Alteration Agreement pursuant to CFG Code Subsection 1601-1616, 5650, if a proposed project would result in the alteration or degradation of a stream, river, or lake in California. The Regional Water Quality Control Board (RWQCB) may require State Water Quality Certification (Clean Water Act Section 401 permit) before other permits are issued, which may involve implementation of a storm water pollution prevention plan.

4.3.2-3 LOCAL REGULATIONS, GOALS AND POLICIES

Napa County General Plan

Natural resource use in Napa County is regulated by the Napa County General Plan (Napa County, 2008). Relevant goals and policies from the General Plan pertaining to biological resources in the project area are presented in **Appendix D**. Additional, relevant County goals and policies are provided below.

Open Space Conservation Policies
Policy CON-1: The County will preserve land for greenbelts, forest, recreation, flood control, adequate water supply, air quality improvement, habitat for fish, wildlife and wildlife movement, native vegetation, and natural beauty. The County will encourage management of these areas in ways that promote wildlife habitat renewal, diversification, and protection.

Policy CON-2: The County shall identify, improve, and conserve Napa County's agricultural land by:

- Requiring existing significant vegetation be retained and incorporated into agricultural projects to reduce soil erosion and to retain wildlife habitat. When retention is found to be infeasible, replanting of native or non-invasive vegetation shall be required; and
- Minimizing pesticide and herbicide use and encourage research and use of Integrated pest control methods such as cultural practices, biological control, host resistance, and other factors.

Natural Resource Goals and Policies
Goal CON 2: Maintain and enhance the existing level of biodiversity.

Goal CON-3: Protect the continued presence of special status species, including special status plants, special status wildlife, and their habitats, and comply with all applicable state, federal, or local laws or regulations.

Goal CON-4: Conserve, protect, and improve plant, wildlife, and fishery habitats for all native species in Napa County.

Goal CON-5: Protect connectivity and continuous habitat areas for wildlife movement.

Policy CON-10: The County shall conserve and improve fisheries and wildlife habitat in cooperation with governmental agencies, private associations and individuals in Napa County.

Policy CON-11: The County shall maintain and improve fisheries habitat through a variety of appropriate measures, including (the following lettered policies):

m) Control sediment production from mines, roads, development projects, agricultural activities, and other potential sediment sources.
n) Implement road construction and maintenance practices to minimize bank failure and sediment delivery to streams.

Policy CON-13: The County shall require that all discretionary residential, commercial, industrial, recreational, agricultural, and water development projects consider and address impacts to wildlife habitat and avoid impacts to fisheries and habitat supporting special status species to the extent feasible. Where impacts to wildlife and special status species cannot be avoided, projects shall include effective mitigation measures and management plans including provisions to (the following lettered policies):

a) Maintain the following essentials for fish and wildlife resources:
    3) Adequate amounts of feeding, escape, and nesting habitat.
    4) Proper temperature through maintenance and enhancement of streamside vegetation, volume of flows, and velocity of water.
c) Employ supplemental planting and maintenance of grasses, shrubs and trees of like quality and quantity to provide adequate vegetation cover to enhance water quality, minimize sedimentation and soil transport, and provide adequate shelter and food for wildlife and special status species and maintain the watersheds, especially stream side areas, in good condition.
d) Provide protection for habitat supporting special status species through buffering or other means.
e) Provide replacement habitat of like quantity and quality on- or off-site for special status species to mitigate impacts to special status species.
f) Enhance existing habitat values, particularly for special status species, through restoration and replanting of native plant species as part of discretionary permit review and approval.
g) Require temporary or permanent buffers of adequate size (based on the requirements of the subject special status species) to avoid nest abandonment by birds and raptors associated with construction and site development activities.

Policy CON-14: To offset possible losses of fishery and riparian habitat due to discretionary development projects, developers shall be responsible for mitigation when avoidance of impacts is determined to be infeasible. Such mitigation measures may include providing and permanently maintaining similar quality and quantity habitat within Napa County, enhancing existing riparian habitat, or paying in-kind funds to an approved fishery and riparian habitat improvement and acquisition fund. Replacement habitat may occur either

on- site or at approved off-site locations, but preference shall be given to on-site replacement.

Policy CON-16: The County shall require a biological resources evaluation for discretionary projects in areas identified to contain or potentially contain special status species based upon data provided in the NCBDR (NCCDPD, 2005), CNDDB, or other technical materials. This evaluation shall be conducted prior to the approval of any earthmoving activities. The County shall also encourage the development of programs to protect special status species and disseminate updated information to state and federal resource agencies.

Policy CON-17: Preserve and protect native grasslands, serpentine grasslands, mixed serpentine chaparral, and other sensitive biotic communities and habitats of limited distribution. The County, in its discretion, shall require mitigation that results in the following standards:

a) Prevent removal or disturbance of sensitive natural plant communities that contain special status plant species or provide critical habitat to special status animal species.
b) In other areas, avoid disturbances to or removal of sensitive natural plant communities and mitigate potentially significant impacts where avoidance is infeasible.
c) Promote protection from overgrazing and other destructive activities.
d) Encourage scientific study and require monitoring and active management where biotic communities and habitats of limited distribution or sensitive natural plant communities are threatened by the spread of invasive non-native species.
e) Require no net loss of sensitive biotic communities and habitats of limited distribution through avoidance, restoration, or replacement where feasible. Where avoidance, restoration, or replacement is not feasible, preserve like habitat at a 2:1 ratio or greater within Napa County to avoid significant cumulative loss of valuable habitats.

Policy CON-18: To reduce impacts on habitat conservation and connectivity (the following lettered polices apply):

a) In sensitive domestic water supply drainages where new development is required to retain between 40 and 60 percent of the existing (as of June 16, 1993) vegetation onsite, the vegetation selected for retention should be in areas designed to maximize habitat value and connectivity.
c) Preservation of habitat and connectivity of adequate size, quality, and configuration to support special status species should be required within the project area. The size of habitat and connectivity to be preserved shall be determined based on the specifics needs of the species.

d) The County shall require discretionary projects to retain movement corridors of adequate size and habitat quality to allow for continued wildlife use based on the needs of the species occupying the habitat.
e) The County shall require new vineyard development to be designed to minimize the reduction of wildlife movement to the maximum extent feasible. In the event the County concludes that such development will have a significant impact on wildlife movement, the County may require the applicant to relocate or remove existing perimeter fencing installed on or after February 16, 2007 to offset the impact caused by the new vineyard development.
h) Support public acquisition, conservation easements, in-lieu fees where on-site mitigation is infeasible, and/or other measures to ensure long-term protection of wildlife movement areas.

Policy CON-19: The County shall encourage the preservation of critical habitat areas and habitat connectivity through the use of conservation easements or other methods as well as through continued implementation of the Napa County Conservation Regulations associated with vegetation retention and setbacks from waterways.

Policy CON-22: The County shall encourage the protection and enhancement of natural habitats which provide ecological and other scientific purposes. As areas are identified, they should be delineated on environmental constraints maps so that appropriate steps can be taken to appropriately manage and protect them.

Policy CON-26: Consistent with Napa County's Conservation Regulations, natural vegetation retention areas along perennial and intermittent streams shall vary in width with steepness of the terrain, the nature of the undercover, and type of soil. The design and management of natural vegetation areas shall consider habitat and water quality needs, including the needs of native fish and special status species and flood protection where appropriate. Site-specific setbacks shall be established in coordination with Regional Water Quality Control Boards, California Department of Fish and Game, U.S. Fish and Wildlife Service, National Oceanic and Atmospheric Administration National Marine Fisheries Service, and other coordinating resource agencies that identify essential stream and stream reaches necessary for the health of populations of native fisheries and other sensitive aquatic organisms within the County's watersheds. Where avoidance of impacts to riparian habitat is infeasible along stream reaches, appropriate measures will be undertaken to ensure that protection, restoration, and enhancement activities will occur within these identified stream reaches that support or could support native fisheries and other sensitive aquatic organisms to ensure a no net loss of aquatic habitat functions and values within the county's watersheds.

Policy CON-27: The County shall enforce compliance and continued implementation of the intermittent and perennial stream setback requirements set forth in existing stream setback regulations, provide education and information regarding the importance of stream setbacks and the active management and enhancement/restoration of native vegetation within setbacks, and develop incentives to encourage greater stream setbacks where appropriate. Incentives shall include streamlined permitting for certain vineyard proposals on slopes between five and 30 percent and flexibility regarding yard and road setbacks for other proposals.

Oak Woodlands Goals and Policies

Goal CON-6: Preserve, sustain, and restore forests, woodlands, and commercial timberland for their economic, environmental, recreation, and open space values.

Policy CON-24: Maintain and improve oak woodland habitat to provide for slope stabilization, soil protection, species diversity, and wildlife habitat through appropriate measures including one or more of the following:

a) Preserve, to the extent feasible, oak trees and other significant vegetation that occur near the heads of drainages or depressions to maintain diversity of vegetation type and wildlife habitat as part of agricultural projects.
b) Comply with the Oak Woodlands Preservation Act (PRC Section 21083.4) regarding oak woodland preservation to conserve the integrity and diversity of oak woodlands, and retain, to the maximum extent feasible, existing oak woodland and chaparral communities and other significant vegetation as part of residential, commercial, and industrial approvals.
c) Provide replacement of lost oak woodlands or preservation of like habitat at a 2:1 ratio when retention of existing vegetation is found to be infeasible. Removal of oak species limited in distribution shall be avoided to the maximum extent feasible.
d) Support hardwood cutting criteria that require retention of adequate stands of oak trees sufficient for wildlife, slope stabilization, soil protection, and soil production be left standing.
e) Maintain, to the extent feasible, a mixture of oak species which is needed to ensure acorn production. Black, canyon, live, and brewer oaks as well as blue, white, scrub, and live oaks are common associations.
f) Encourage and support the County Agricultural Commission's enforcement of state and federal regulations concerning Sudden Oak Death and similar future threats to woodlands.

Policy CON-28: To offset possible additional losses of riparian woodland due to discretionary development projects and conversions, developers shall provide and maintain similar quality and quantity of replacement habitat or in-kind funds to an approved riparian

woodland habitat improvement and acquisition fund in Napa County. While on-site replacement is preferred where feasible, replacement habitat may be either on-site or off-site as approved by the County.

Policy CON-29: The County shall coordinate its efforts with other agencies and districts such as the Resource Conservation District and share a leading role in developing and providing outreach and education related to stream setbacks and other best management practices that protect and enhance the County's natural resources.

Policy CON-30: All public and private projects shall avoid impacts to wetlands to the extent feasible. If avoidance is not feasible, projects shall mitigate impacts to wetlands consistent with state and federal policies providing for no net loss of wetland function.

Water Resources Policies
Policy CON-6: The County shall impose conditions on discretionary projects which limit development in environmentally sensitive areas such as those adjacent to rivers or streamside areas and physically hazardous areas such as floodplains, steep slopes, high fire risk areas and geologically hazardous areas.

Policy CON-41: The County will work to protect Napa County's watersheds and public and private water reservoirs to provide for the following purposes:

a) Clean drinking water for public health and safety;
b) Municipal uses, including commercial, industrial and domestic uses;
c) Support of the eco-systems;
d) Agricultural water supply;
e) Recreation and open space; and
f) Scenic beauty.

Policy CON-42: The County shall work to improve and maintain the vitality and health of its watersheds. Specifically, the County shall:

d) Support environmentally sustainable agricultural techniques and best management practices (BMPs) that protect surface water and groundwater quality and quantity (e.g., cover crop management, integrated pest management, informed surface water withdrawals and groundwater use).

Policy CON-45: Protect the County's domestic supply drainages through vegetation preservation and protective buffers to ensure clean and reliable drinking water consistent with state regulations and guidelines. Continue implementation of current Conservation Regulations relevant to these areas, such as vegetation retention requirements, consultation

with water purveyors/system owners, implementation of erosion controls to minimize water pollution, and prohibition of detrimental recreational uses.

Policy CON-48: Proposed developments shall implement project-specific sediment and erosion control measures (e.g., erosion control plans and/or stormwater pollution prevention plans) that maintain pre-development sediment erosion conditions or at minimum comply with state water quality pollution control (i.e., Basin Plan) requirements and are protective of the County's sensitive domestic supply watersheds. Technical reports and/or erosion control plans that recommend site-specific erosion control measures shall meet the requirements of the County Code and provide detailed information regarding site specific geologic, soil, and hydrologic conditions and how the proposed measure will function.

Napa County Code

Stream Setbacks
Napa County Code defines streams and provides setbacks for land clearing for agricultural development. Under Section 18.108.030, a "stream" means any of the following:

1. A watercourse designated by a solid line or dash and three dots symbol on the largest scale of the United State Geological Survey maps most recently published, or any replacement to that symbol;
2. Any watercourse which has a well-defined channel with a depth greater than four feet and banks steeper than 3:1 (horizontal to vertical bank ratio) and contains hydrophilic (i.e., water-adapted) vegetation, riparian vegetation or woody vegetation including tree species greater than ten feet in height; or
3. Those watercourses listed in Resolution No. 94-19 and incorporated herein by reference.

Erosion gullies and ravines being repaired with the technical assistance and/or under the direction of the Napa County Resource Conservation District/National Resource Conservation Service, "scour-holes", and other non-linear features are not considered streams.

Napa County Code 18.108.025 applies setbacks for agricultural development adjacent to streams. Setbacks included in the Code range from 35 to 150 feet measured from the top of bank and increase with the slope of the terrain parallel to the top of bank.

Vegetation Preservation and Replacement
Napa County Code 18.108.100 requires the following conditions when granting a discretionary permit for activities within an erosion hazard area (slopes greater than 5 percent):

- Existing vegetation shall be preserved to the maximum extent consistent with the project. Vegetation shall not be removed if it is identified as being necessary for erosion control in the approved erosion control plan or if necessary for the preservation of threatened or endangered plant or animal habitats as designated by state or federal agencies with jurisdiction and identified on the county's environmental sensitivity maps.
- Existing trees six inches in diameter or larger, measured at diameter breast height, (DBH), or tree stands of trees six inches DBH or larger located on a site for which either an administrative or discretionary permit is required shall not be removed until the required permits have been approved by the decision-making body and tree removal has been specifically authorized.
- Trees to be retained or designated for retention shall be protected through the use of barricades or other appropriate methods to be placed and maintained at their outboard drip line during the construction phase. Where appropriate, the director may require an applicant to install and maintain construction fencing around the trees to ensure their protection during earthmoving activities.
- Wherever removal of vegetation is necessitated or authorized, the director or designee may require the planting of replacement vegetation of an equivalent kind, quality and quantity.

Napa County Baseline Data Report

Napa County prepared a Baseline Data Report (NCBDR) in 2005 in support of the Updated General Plan. The BDR provides data and information on a range of environmental resources within the County, including Biological Resources. The purposes of the Biological Resources Chapter of the BDR are to 1) provide a scientific basis for future regional and site-specific level assessments of project impacts and the evaluation of mitigation measures, conservation proposals, and enhancement opportunities for biological resources; 2) serve as the existing conditions section for biological resources chapters/sections in a planned EIR in support of the County's General Plan Update; 3) serve as a basis to evaluate current and future policies at the local and Countywide level as they relate to biological resource protection and enhancement; and 4) document the methods and definitions used to establish a Countywide searchable biological resources database.

Specifically, the NCBDR recommends that CNPS List 3 and 4 plant species be addressed for projects in Napa County to adequately address local species of concern. The Supplemental Biological Survey Memorandum (AES, 2012) is included in this Draft EIR prepared for the Proposed Project since the supplemental survey methodology and findings documentation satisfy the standards and requirements of the Napa County General Plan (General Plan; Napa County, 2008), including those outlined in the NCBDR (Napa County, 2005), in relation to special-status plant species (including local species of concern covered

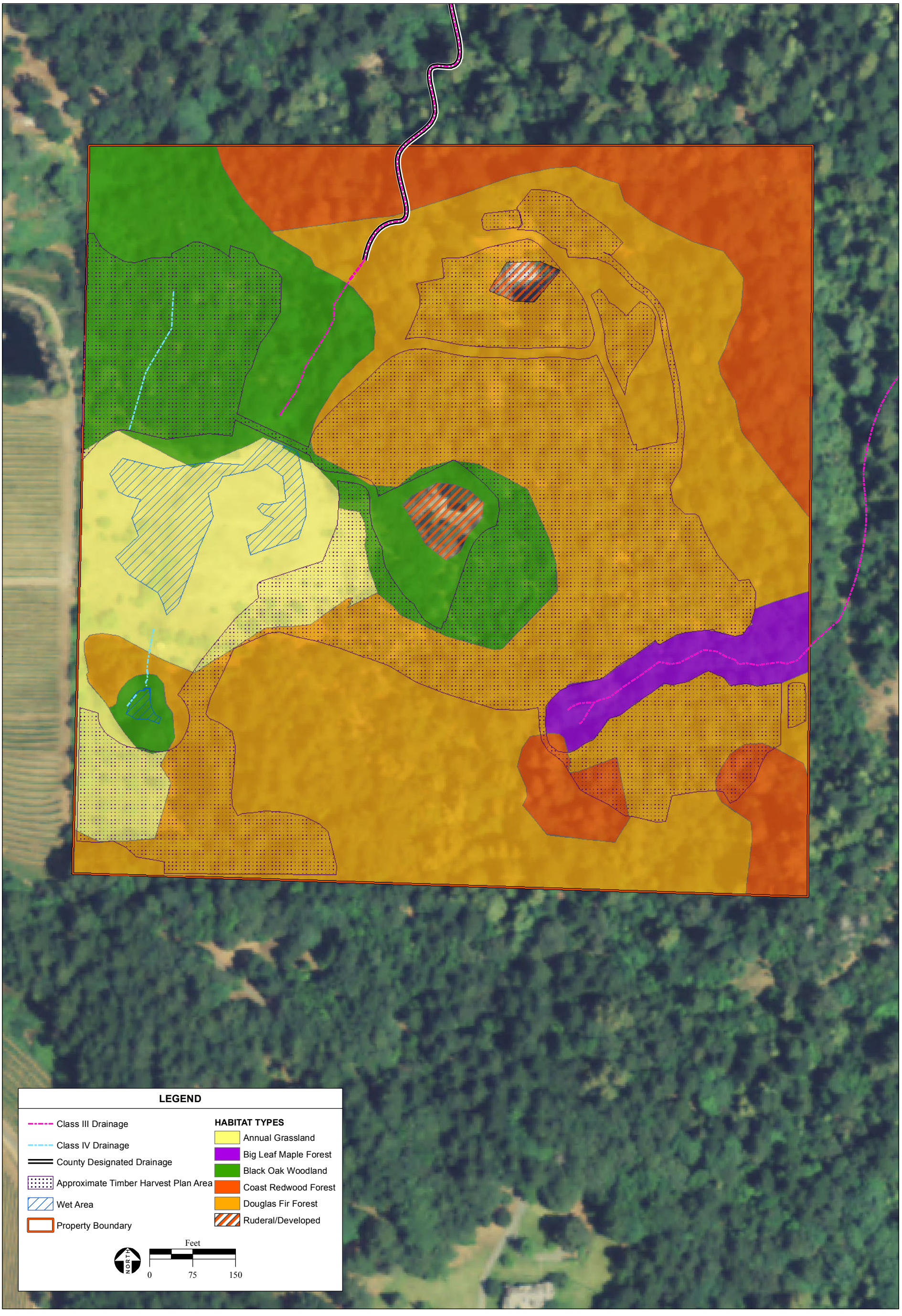
under CNPS List 3 and 4) and vegetation communities. See **Appendix D** for the Supplemental Biological Survey Memorandum and the final Biological Resources Report.

4.3.3 ENVIRONMENTAL SETTING

4.3.3-1 REGIONAL SETTING

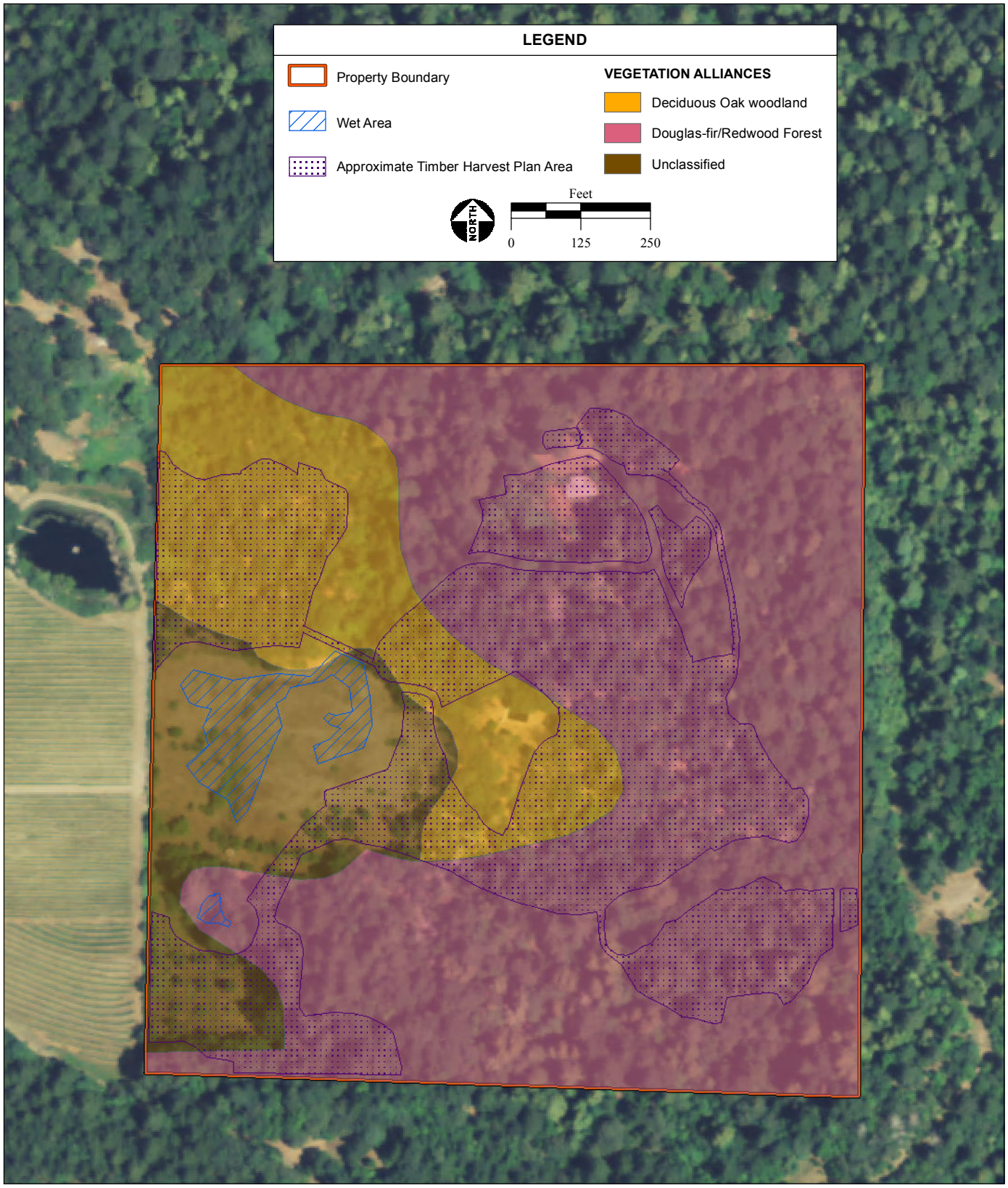
Napa County is located within the Inner North Coast Range Mountains, a geographic subdivision of the larger California Floristic Province (Hickman, 1993a), which is strongly influenced by the Pacific Ocean. The region is in climate Zone 14 "Ocean Influenced Northern and Central California," characterized as an inland area with ocean or cold air influence. The climate of the region is characterized by hot, dry summers and cool, wet winters; average precipitation ranges from approximately 20 to 40 inches per year (World Climate, 2008). The average annual temperature for the region ranges from 45 to 90 degrees Fahrenheit. Napa County extends from an elevation of zero feet above sea level on the west side to approximately 4,200 feet above sea level on the east side. Because of its dramatic variation in climate and topographic diversity, Napa County has a high natural level of biodiversity compared to the rest of California.

The dominant natural land cover types in the vicinity of the property, as mapped by Napa County, include deciduous oak woodlands, coniferous forests, grasslands, and some riparian woodlands. A map of habitat types within the property as further described by Kjeldsen (2011) and refined during the 2011 field surveys is shown as **Figure 4.3-1**. A map of the general Vegetation Alliances onsite as defined in Napa County's BDR is shown as **Figure 4.3-2**. Oak woodlands are the dominant natural land cover type in Napa County, covering over 167,000 acres (33 percent of the land cover in Napa County) and are typically characterized by several oak species, including coast live oak (*Quercus agrifolia*), interior live oak (*Quercus wislizenii*), and black oak (*Quercus kelloggii*) (NCCDPD, 2005). Coniferous forests are also common in the County's higher elevation areas, occurring on almost 38,000 acres. The coniferous forest in the vicinity of the property consists mainly of Douglas fir/redwood forest and dominant species include Douglas fir (*Pseudotsuga menziesii*) and coast redwood (*Sequoia sempervirens*). Grassland covers over 53,700 acres or nearly 11 percent of the County. The dominant grasses in Napa County, and across California, are non-native including wild oats (*Avena* spp.), brome grasses (*Bromus* spp.), wild barley (*Hordeum* spp.), Italian ryegrass (*Lolium multiflorum*), medusa head (*Taeniantherum caput-medusae*), and annual fescue (*Vulpia*) species. Riparian woodland is less common in Napa County and covers only 11,000 acres (two percent of land cover in Napa County). Riparian woodland occurs along stream corridors and is dominated by several different species of conifers and broad-leaved trees depending on the specific microclimate where it occurs. Agricultural cropland in the vicinity of the property is dominated by vineyards, which occupy over 40,000 acres in Napa County.



SOURCE: Napa Valley Vineyard Engineering, 9/2010; Kjeldsen Biological Consulting, 2010; NAIP Aerial Photograph, 6/7/2009; AES, 2012

Figure 4.3-1
Habitat Map



SOURCE: Napa Valley Vineyard Engineering, 9/2010; Napa County, 2002;
NAIP Aerial Photograph, 6/7/2009; AES, 2012

Figure 4.3-2

Napa County Vegetation Alliances

The property is located on a southeast-facing ridge near the upper end of Napa Valley within the "Calistoga, California" USGS 7.5 minute quad. Elevations range from 1,000 to 1,200 feet above sea level. Slopes on the property range from three to 42 percent (Napa Valley Vineyard Engineering, 2011). The ridge top area of the property is composed of gentle east-facing slopes.

4.3.3-2 SUBJECT PROPERTY

As described in **Section 3.0 Project Description**, the property is located in the 1,852-acre Kortum Canyon Creek watershed and contains two Class III watercourses and one Class IV drainage. As defined by the California Department of Forestry and Fire Protection (Cal Fire), Class III drainages are those with no aquatic life present, but are capable of sediment transport to Class I or Class II waters under normal high water flow conditions. Class IV drainages are defined as man-made watercourses, usually downstream, established for domestic, agricultural, hydroelectric supply or other beneficial use (Cal Fire, 2011) . In addition, a spring with adjacent wet area is located in the western portion of the property. Under the Proposed Project, these onsite water features will be protected by a Water and Lake Protection Zone (WLPZ). The Proposed Project, including the timber harvest and vineyard footprints, will be set back from the Class III watercourses as well as the spring and associated wet area and no activities will take place within these setbacks. Setbacks for The Class IV drainage are not required under the County's steam classification system.

Two unnamed, seasonal Class III watercourses occur in the northwest and southeast portions of the property. There is also a natural spring and adjacent wet area located in the southwest corner of the property. This spring has historically been used for agricultural and domestic purposes on the property. Groundwater from the spring is anticipated to meet the water needs for establishing the vines and once established the vineyard will be dry farmed. Since the vineyard will be dry farmed, water usage is expected to be four± acre-feet per year. The spring area contains a spring box, a concrete cistern, and a wooden water tank (Kjeldsen, 2011). Both the cistern and water tank are currently not in operation. The spring is currently connected by above ground piping to a water storage tank approximately 540 feet to the northeast. Presently, overflow from the spring creates a wet area surrounding the spring site. This spring and wet area will be protected by a minimum 50 foot buffer from any impacts from the Proposed Project. The wet area terminates before it meets the proposed farm avenue between vineyard blocks A and E, which is upslope of the beginnings of a Class III watercourse that forms in the northwest corner of the property and flows north before exiting the property boundary.

The northwest Class III watercourse forms approximately 50 feet north of the proposed vineyard avenue between vineyard blocks A and E, where it then flows north (absent of a defined bed and bank) for approximately 150 feet whereby at this point it becomes

channelized and is classified as a County designated drainage. After exiting the property to the north, this Class III drainage flows along Diamond Mountain Road to Kortum Canyon Creek. This watercourse has a protection zone of up to 85 feet on the west side and at least 35 feet on the east side of the drainage within the property, and will not be impacted by the Proposed Project.

The southeastern Class III watercourse on the property originates from a seep and flows east, exiting the property and later combining with the northwest Class III watercourse, which then flows to Kortum Canyon Creek and then to the Napa River. This watercourse has a 35 foot setback, which exceeds the Forest Practice Rules guidelines, and will not be impacted by the Proposed Project.

The Class IV drainage occurs in the northwest corner of the property where its flow dissipates before it reaches the northern edge of the proposed vineyard block A. Setbacks for this drainage are not designated under the County's steam classification requirements. The designated setbacks for the other onsite water features are provided in the ECP (**Appendix B**) for the timber harvest and vineyard conversion elements of the Proposed Project.

Soils within the property are classified by the U.S. Department of Agriculture (USDA) Soil Conservation Service's, Napa County Soil Survey as Soil Conservation Services (SCS) 100 & 102, Aiken Loam, with an erosion hazard rating of moderate. Given the existing slopes, the soils within the property are more properly classified as SCS 101, Aiken Loam, 9 to 30 percent (refer to **Section 4.5** for further discussion of soils). Elevations onsite range from 520 to 633 meters above mean sea level (amsl).

In the local area of the property, the mean annual precipitation is 30 to 50 inches, and the mean annual temperature is 54 to 55 degrees Fahrenheit. Summers are warm and dry while winters are cool and moist and the frost-free season is generally 200 to 250 days.

4.3.4 BIOTIC COMMUNITIES AND ALLIANCES

Biotic communities are the characteristic assemblages of plants and animals that are found in a given range of soil, climate, and topographic conditions across a region. Biotic communities across Napa County were originally mapped by Thorne et al. (1994). On the property, the vegetation mapping was modified by Kjeldsen (2011), based on site specific studies, to better describe existing conditions, to capture finer-scale vegetation differences, as well as to use updated classifications of biotic communities in the revised *Manual of California Vegetation, Second Edition* (MCV) (Sawyer et al., 2009). The vegetation types were ground-truthed and further refined by AES Botanist Laura Burris and Registered Professional Forester Scott Butler during an August 29, 2011 site visit. Some provisional

biotic community descriptions were created when a given community was not sufficiently described by an existing biotic community type. The primary purpose of the MCV classification is to assist in the location and determination of significance and rarity of various vegetation types (biotic communities).

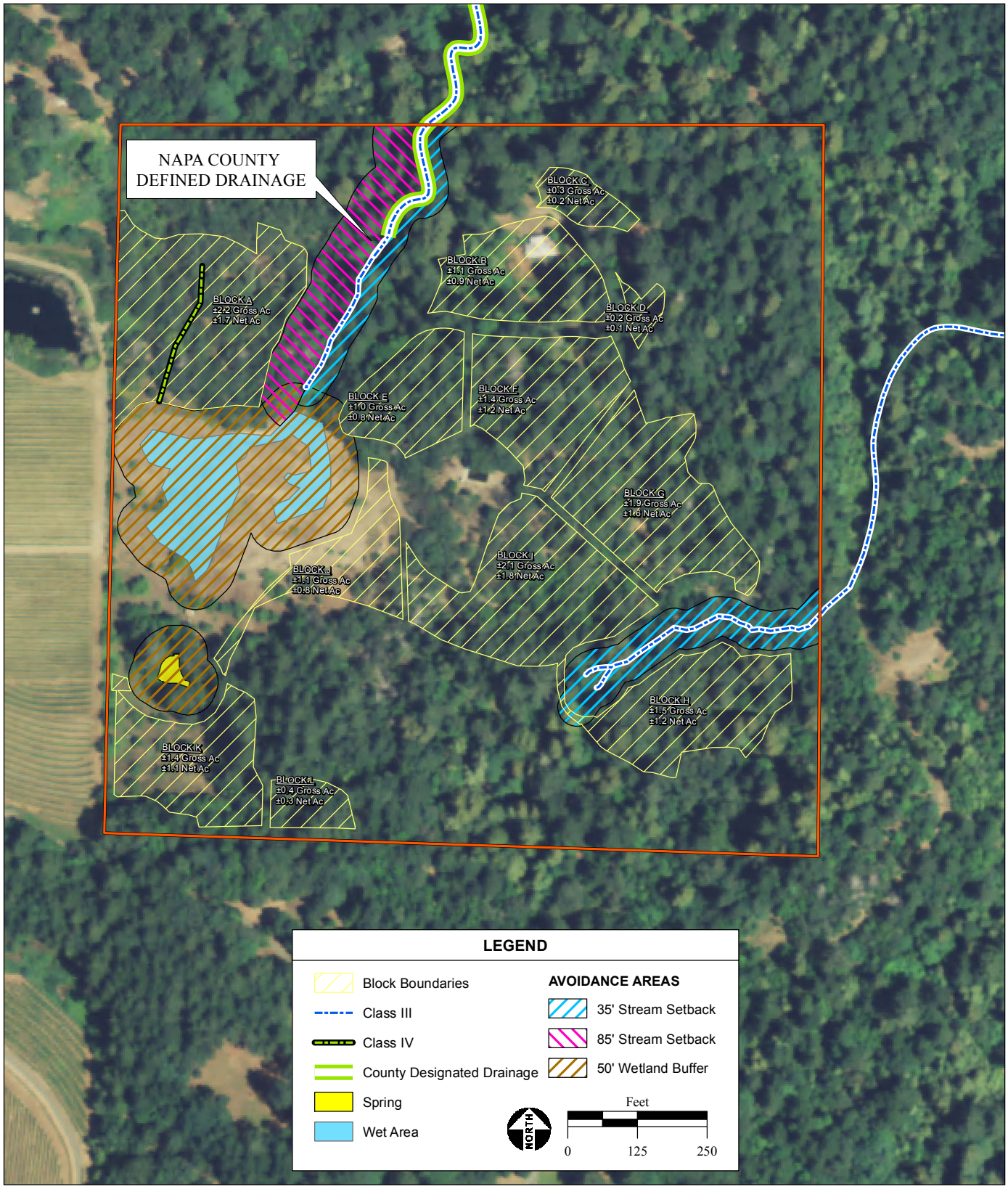
Jurisdiction over Sensitive Biotic Communities that are considered critical habitat for species listed as threatened or endangered by the Federal government lies with the USFWS and National Marine Fisheries Service (NMFS) under the National Oceanic and Atmospheric Administration (NOAA). The CDFG considers Sensitive Biotic Communities to be those which are listed in the CNDDB (e.g., native grasslands; 2003). Sensitive Biotic Communities are either designated by CDFG, considered by local experts to be communities of limited distribution, and/or considered to be waters of the U.S. or the state (Napa County, 2008). Sensitive biotic communities in Napa County were identified using a two-step process (NCBDR, 2005):

1. An existing list of Sensitive Biotic Communities prepared by the CDFG (2003) was first reviewed by qualified biologists, and those communities that may occur in the County were identified. Because the community names in the CDFG list (2003) did not correspond directly with the names used in the County's Land Cover Layer, a determination was made as to which land cover types on the Land Cover Layer correspond to the communities on the CDFG list.

2. The aerial extent of each land cover type mapped in the County was generated from the land cover layer. Those biotic communities with an aerial extent of less than 500 acres in the County (approximately 0.1 percent of the County) were identified. These communities were discussed with local experts and their conservation importance established. Those that were not already on the original CDFG list and that were determined to be worthy of conservation were added to the list.

Other natural communities in the County are considered sensitive simply due to their limited local distribution. These Biotic Communities of Limited Distribution encompass less than 500 acres of cover within the County and are considered by local biological experts to be worthy of conservation (e.g., Coast Redwood Alliance; Napa County, 2008).

Figure 4.3-1 shows the five vegetation alliances, or habitat types within the property. These habitat types were refined from the Vegetation Alliances mapped by Napa County within the property. **Table 4.3-1** reports the gross acreage of each vegetation type in Napa County (when those estimates were available), on the property, and summed across the proposed vineyard blocks. Wetlands and other sensitive habitats to be avoided by the Proposed Project are illustrated in **Figure 4.3-3**. Representative photographs of each vegetation type



SOURCE: Napa Valley Vineyard Engineering, 9/2010; NAIP Aerial Photograph, 6/7/2009; AES, 2011

Figure 4.3-3

Biological Resources and Avoidance Areas

TABLE 4.3-1
BIOTIC COMMUNITIES IN NAPA COUNTY AND ON THE SUBJECT PROPERTY

	NAPA COUNTY		PROPERTY		PROPOSED VINEYARD DEVELOPMENT		
BIOTIC COMMUNITY	ESTIMATED ACREAGE IN NAPA COUNTY[1]	PERCENT OF TOTAL ACREAGE IN NAPA COUNTY	TOTAL ACREAGE ON PROPERTY* (37.31 ac)	PERCENT OF VEGETATION TYPE IN NAPA COUNTY	ACREAGE OF VEGETATION TYPE PROPOSED FOR DEVELOPMENT[3]	PERCENT OF VEGETATION TYPE IMPACTED ON PROPERTY	PERCENT OF VEGETATION TYPE IN NAPA COUNTY IMPACTED
California Annual Grassland[2]	39,174.00	7.72%	4.34	0.011%	1.22	28.11%	0.003%
Black Oak Woodland	2,572.00	0.51%	6.70	0.26%	3.35	50.00%	0.13%
Douglas Fir Forest	17,280.00	3.41%	20.00	0.12%	9.74	48.70%	0.06%
Coast Redwood Forest	324.00	0.06%	5.23	1.61%	0.27	5.16%	0.08%
Big Leaf Maple Forest	NA	NA	1.04	NA	0	0%	NA

Notes: *Acreages have been updated from Kjeldsen, 2011 for improved accuracy. All acreages are approximate and total property acreage calculated above may differ slightly from the property acreage noted in the project description (38± acres) due to differences in GIS calculations. NA = data not available.
[1]Based on Thorne et al., 2004.
[2]Wild Oats Grassland is a common subset of California Annual Grassland.
[3]Includes proposed vineyard development and erosion control measures within the 14± acre THP envelope
Sources: AES, 2011; Kjeldsen, 2011; Thorne et al., 2004

.

as defined in the biological study completed for the project are provided in **Figures 4.3-4a** and **b** (Kjeldsen, 2011). A complete list of plant species observed on the property during the 2010 field surveys and a complete list of animal species that were seen, heard, or for which there were evident signs of presence, are included in **Appendix D**. The biotic communities present on the property are cited in **Appendix D** and are described in greater detail below in **Sections 4.3.4-1** through **4.3.4-3**.

4.3.4-1 ANNUAL GRASSLANDS

There are two types of annual grasslands on the property: Wild Oats Grassland (*Avena* [*barbata*, *fatua*] Semi-Natural Herbaceous Stands), and Perennial Rye Grass Fields (*Lolium perenne* Semi-Natural Herbaceous Stands). Both of these grassland types were formerly grouped into the less descriptive California Annual Grasslands Alliance, which is currently used for classification in Napa County (NCBDR, 2005). The total combined acreage of California Annual Grasslands Alliance in Napa County is approximately 39,175 acres (7.7 percent of the total land cover). California Annual Grasslands Alliance manifested as Wild Oats Grassland and Perennial Rye Grass Fields on the property sum to approximately 4.34 acres (0.011 percent of the total grasslands mapped in Napa County; Thorne et al., 2004; **Table 4.3-1**).

Wild Oats Grassland (*Avena* [*barbata, fatua*] Semi-Natural Stands)

This vegetation type is typically dominated by non-native annual grasses and occupies many areas that were historically dominated by native grasses and forbs. Wild Oats Grassland on the property is shown in **Figures 4.3-1** and **4.3-4b**. The dominant plant species usually found in this community include slender wild oats (*Avena barbata*), ripgut brome (*Bromus diandrus*), Italian ryegrass, and soft chess (*Bromus hordeaceus*). Other grass species such as (hare) barley (*Hordeum murinum* ssp. *leporinum*) are also locally abundant. Non-native forbs are often found in association with this grassland habitat type and may include filaree (*Erodium botrys*), rose clover (*Trifolium hirtum*), Italian thistle (*Carduus pycnocephalus*), yellow star thistle (*Centaurea solstitialis*), and milk thistle (*Silybum marianum*). Non-native forbs such as black mustard (*Brassica nigra*) also form large monotypic patches in some areas. Native forbs such as Menzies' fiddleneck (*Amsinckia menziesii* var. *menziesii*), harvest brodiaea (*Brodiaea elegans*), sky lupine (*Lupinus nanus*), mule's ears (*Wyethia glabra*), gold nuggets (*Calochortus luteus*), common popcorn flower (*Plagiobothrys nothofulvus*), and others grow sparsely among non-native grasses in the area.

Although Wild Oats Grassland is dominated by non-native species, large, relatively undisturbed expanses of this vegetation can support a diversity of wildlife species that were historically associated with native California grassland alliances. Species of small mammals

PHOTO 1: View of typical conifer (Douglas-fir-Tan Oak) habitat associated with the THP/TCP illustrating the seral age classes present and successional oak understory development in the absence of a fire regime.

PHOTO 2: Oak woodlands on the project site (Block A).

PHOTO 3: Interfacing oak and conifer woodlands in the background that are part of the THP/TCP (Block K) and ruderal habitat associated with the old orchard in the foreground.

PHOTO 4: Mixed Oak woodland in Block E (Quercus kelloggii Woodland Alliance)

SOURCE: Kjeldsen Biological Consulting, 2/18/2011; AES, 2011

Figure 4.3-4a
Site Photographs

PHOTO 5: Agricultural grasslands with orchard and conifer woodlands in the background.

PHOTO 6: Spring that will be avoided.

PHOTO 7: View of wetlands below spring.

SOURCE: Kjeldsen Biological Consulting, 2/18/2011; AES, 2011

Figure 4.3-4b
Site Photographs

known from the area and likely to occur within this vegetation community include Botta's pocket gopher (*Thomomys bottae*), deer mouse (*Peromyscus maniculatus*), ornate shrew (*Sorex ornatus*), California vole (*Microtus californicus*), and western harvest mouse (*Reithrodontomys megalotis*). Larger mammals that use grasslands include the black-tailed jackrabbit (*Lepus californicus*), and mule deer (*Odocoileus hemionus*). The pallid bat (*Antrozous pallidus*), which feeds primarily on large terrestrial arthropods in open habitats, is likely to be present on the site and forage in the grassland. Predators that may forage for small mammals in grasslands and have been observed through sight or sign (i.e. scat) on the property include red-tailed hawk (*Buteo jamaicensis*), red-shouldered hawk (*Buteo lineatus*), and coyote (*Canis latrans*) (Kjeldsen, 2011; **Appendix D**).

Perennial Rye Grass Field (*Lolium perenne* Semi-Natural Stands)

This vegetation type is dominated by perennial rye grass (*Lolium perenne*) which is a perennial, or annual cool-season non-native bunchgrass introduced from Europe. This grassland habitat type is usually the result of past agricultural practices and is sometimes referred to as ruderal agrestal pastoral grassland. Perennial rye grass fields are present in fallow agricultural lands, such as the orchard in the southeast corner of the property, and are intermixed with the wild oat grassland described above throughout the southwestern portion of the property (**Figures 4.3-1** and **4.3-4b**). Associated species that occur in this grassland type are similar to those described above in the Wild Oats grassland.

Because the area of Perennial Rye Grass Fields was small and this habitat type intergrades readily with the Wild Oats Grasslands onsite, it is not mapped separately from the overall Annual Grassland Classification (**Figure 4.3-1**). In total, a small portion (1.22 acres or 28 percent) of the California Annual Grassland located within an abandoned orchard at the southwestern edge of the property would be developed into vineyard under the Proposed Project (**Figure 4.3-1; Table 4.3-1**).

4.3.4-2 WOODLANDS

The woodland habitats onsite can be classified in several broad categories: Deciduous Oak Woodland, North Coast Coniferous Forest, and Montane Riparian Woodland. These woodlands intergrade with one another along their margins, creating continuous canopy cover over much of the property. Individual woodland classifications are discussed further below.

Deciduous Oak Woodland

Black Oak Woodland (*Quercus kelloggii* Woodland Alliance)

The Deciduous Oak Woodland mapped onsite is dominated by black oak (*Quercus kelloggii*). Black Oak Woodland is usually found in the County at higher elevations and in somewhat protected areas on all slope aspects except south-facing slopes. This habitat

type is present primarily within the center and northeastern portions of the property. Approximately 6.70 acres of Black Oak Woodland is present on the property (**Figures 4.3-1** and **4.3-4a; Table 4.3-1**).

The Black Oak Woodland onsite intergrades with Douglas Fir Forest along its margins, especially on ridges where the slopes gain a southern trend. In many areas onsite, Douglas Fir (*Pseudotsuga menziesii*) saplings are becoming dominant in the understory of the Black Oak Woodland. This recruitment of Douglas fir in the oak woodland could be a natural forest succession trend or resultant from past logging and other disturbances onsite. For example, the area surrounding the former home site in the center of the property (outside of the Proposed Project footprint) includes an abandoned structure, cement pad, and rubble pile. While the overstory here is dominated by black oak, the shrub layer in the understory contains several successional species that require some type of disturbance regime, such as fire or timber harvest, for seed germination and growth. Examples of species in the understory that are reliant on disturbance are scrub species such as Manzanita (*Arctostaphylos* spp.), Scotch broom (*Cytisus scoparius*), and ceanothus (*Ceanothus* spp.). Other understory vegetation is sparse, limited to herbaceous species similar to those found in the annual grassland habitats described above.

Black Oak Woodland provides habitat for many wildlife species,especially those who are disseminators of acorns such as acorn woodpecker (*Melanerpes formicivorus*), western scrub jay (*Aphelocoma californica*), and western gray squirrel (*Sciurus griseus*), and those that use acorns as major sources of nutrition such as dusky-footed woodrat (*Neotoma fuscipes*), California ground squirrel (*Otospermophilus beecheyi*), and mule deer to name a few (CDFG, 1988).

Black Oak Woodland in Napa County covers approximately 2,572 acres, or roughly 0.51 percent of the total vegetative cover in the County. Approximately 3.35 acres (50 percent) of the approximately 6.70 acres of this alliance on the property would be developed into vineyard (**Table 4.3-1**).

North Coast Coniferous Forest

Douglas Fir Forest (*Pseudotsuga menziesii* Forest Alliance) and Douglas Fir – Tanoak Forest (*Pseudotsuga menziesii – Lithocarpus densiflorus* Forest Alliance)

Douglas Fir and Douglas Fir-Tanoak Forests are discussed together in this EIR due to their similarity in associated species composition, regional distribution, and the contiguous nature of the two forest types on the property. Approximately 20 acres of Douglas Fir Forest is present on the property (**Figures 4.3-1** and **4.3-4a**).

Douglas Fir Forest is the predominant habitat type within the property. This habitat type on the property has been historically harvested for timber. Douglas fir is the dominant tree in the overstory and is commonly interspersed with tanoak (*Lithocarpus densiflora*) throughout the 38± acre property. Coast redwoods (*Sequoia sempervirens*) are also a common overstory associate in Douglas Fir Forest.

Douglas Fir Forest can support a wide diversity of wildlife species. Species of small mammals known to occur in this habitat type include dusky-footed woodrat, deer mouse, and ornate shrew. The distribution of many reptiles and amphibians coincides with that of Douglas Fir Forest. Bird species such as northern spotted owl (*Strix occidentalis*) and various thrushes, vireos, and warblers are commonly associated with this habitat type, as well.

Douglas Fir Forest in Napa County covers approximately 17,280 acres, or roughly 3.41 percent of the total vegetative cover in the County. Approximately 9.74 acres (48.7 percent) of the approximately 20 acres of this alliance on the property would be developed into vineyard (**Table 4.3-1**).

Coast Redwood Forest (*Sequoia sempervirens* Forest Alliance)

Coast Redwood Forest is usually present in areas where groundwater moisture is available or in areas containing coastal fog influences. It is found in the margins primarily along the ridge on the northern and eastern sides of the property. Approximately 5.23 acres of Coast Redwood Forest is present on the property (**Figure 4.3-1; Table 4.3-1**).

The NCBDR considers Coast Redwood Forest to be a sensitive biotic community. This habitat onsite is not separately identified in the NCBDR but is instead grouped together with Douglas fir and labeled “Douglas Fir/Redwood Forest” (**Figure 4.3-2**). Coast Redwood Forest onsite intergrades readily with the Douglas Fir Forest; however, coast redwood is the dominant overstory species as identified by Kjeldsen (2011). Coast Redwood Forest supports many of the same wildlife species as does Douglas Fir Forest described above.

Coast Redwood Forest in Napa County covers approximately 324 acres, or roughly 0.06 percent of the total vegetative cover in the County. Approximately 0.27 acre (5.16 percent) of the approximately 5.23 acres of this alliance on the property would be developed into vineyard (**Table 4.3-1**).

Montane Riparian Woodland

Bigleaf Maple Forest (*Acer macrophyllum* Forest Alliance)

Bigleaf Maple Forests are characterized by at least 25 percent relative cover of bigleaf maple (*Acer macrophyllum*) in the canopy (Sawyer, et. al., 2009). Common associates in this forest type include California bay, Douglas fir, coast redwood, and black oak. The

understory may contain sparse to abundant shrub and/or herbaceous layers. Bigleaf Maple Forest on the property is found only in the area of higher moisture along the southernmost drainage. This alliance intergrades with the surrounding mixed coniferous forest on the property. Approximately 1.04 acres of Bigleaf Maple Forest is present on the property (**Figures 4.3-1; Table 4.3-1**).

This forest alliance is not individually mapped by the County of Napa (Thorne, et. al., 2004). This habitat type lies within the stream buffer for the southeastern Class III drainage onsite and shall be avoided entirely by the Proposed Project (**Table 4.3-1**).

4.3.4-3 WETLANDS, DRAINAGES AND WATERS OF THE U.S.

A formal delineation of wetlands and waters of the U.S. has not been conducted on the property; however, wetlands and watercourses have been identified on the property that may be under the jurisdiction of the USACE, RWQCB, and CDFG. The County defines a creek as a watercourse designated by a solid line or dash and three dot symbol on the largest scale of the U.S. Geological Survey maps, or any watercourse which has a well-defined channel with a depth greater than four feet and banks steeper than 3:1 and contains hydrophilic vegetation, riparian vegetation, or woody vegetation including tree species greater than ten feet in height. The County specifies development setbacks for streams as well.

Developed Spring

A developed spring is located in the southwestern quadrant of the property and is associated with an adjacent wet area. Presently, there is a two inch PVC pipe that extends aboveground across the wet area linking the spring site to a water tank located to the north. This entire area is located outside of the timber harvest and vineyard conversion construction activities and is therefore not considered to be part of the Proposed Project and would be avoided by a minimum 50-foot setback (**Figure 4.3-1; Appendix B**).

Vegetation commonly found in the vicinity of the spring in this area include: common rush (*Juncus effusus*), pennyroyal (*Mentha pulegium*), water speedwell (*Veronica anagallis-aquatica*), mannagrass (*Glyceria leptostachya*), water cress (*Rorippa nasturtium-aquaticum*), common monkey flower (*Mimulus guttatus*), tinker's penny (*Hypericum anagalloides*), nutsedge (*Cyperus eragrostis*), western sword fern (*Polystichum mniutum*), and bentgrasses (*Agrostis exarata* and *A. viridis*).

Springs are generally a water source for a wide variety of wildlife species during the dry season and various amphibian species may use springs as refugia during the non-breeding season.

Seasonal Wetland

One seasonal wetland occurs on the property and is noted as the "wet area" adjacent to the spring in the western portion of the property as shown in **Figure 4.3-1** and **Appendix B**. This seasonal wetland is fed from an upslope spring in the southwest corner of the property (as described above) located adjacent to proposed vineyard block K. The Proposed Project has been designed to avoid this seasonal wetland, including setback buffers at a minimum of 50 feet on all sides of the wetland.

Streams

Two unnamed, seasonal Class III, and one Class IV watercourse occur in the northwest and southeast portions of the property (**Figure 4.3-1**).

The northwest Class III watercourse forms approximately 50 feet north of the proposed vineyard avenue between vineyard blocks A and E, where it then flows north (absent of a defined bed and bank) for approximately 320 feet whereby at this point it becomes more incised, contains a defined bed and bank with some larger cobbles and is classified as a County designated drainage. After exiting the property to the north, this Class III drainage flows along Diamond Mountain Road to Kortum Canyon Creek. This northwest Class III has a minimum setback of 85 feet on the west side and at least 35 feet on the east side, per Napa County standards measured from top of bank (refer to **Appendix B**).

The southeastern Class III watercourse on the property originates from seeps and flows east, exiting the property and later combining with the northwest Class III watercourse, which then flows to Kortum Canyon Creek and then to the Napa River. This stream is associated with the Bigleaf Maple Forest and does not contain a highly defined bed and bank or any gravel substrates. Consistent with Napa County standards and the recommendations of the Registered Professional Forester (Environmental Resources Management), this stream has a minimum 35 foot setback on each side (**Appendix B**).

The Class IV drainage occurs in the northwest corner of the property where its flow dissipates before it reaches the northern edge of proposed vineyard block A. This Class IV drainage, as defined by Cal Fire designations, does not meet Napa County's definition of a stream; therefore, setbacks are not defined for this drainage. This Class IV drainage is manmade as a result of improper drainage from offsite slopes, and thus, this improper drainage is corrected via the control measures in the ECP (**Section 3.0**). This drainage is barely discernible as a swale that channels surface water during rain events through the existing Oak Woodland onsite. It does not have a defined bed or bank, nor is there any associated wetland vegetation present.

4.3.4-4 WILDLIFE MOVEMENT

Wildlife movement is increasingly restricted by urban and agricultural development. The property has been harvested for timber in the past and shows signs of succession and re-growth of shrubs and trees. It is also surrounded on three sides by contiguous woodlands that provide excellent home range habitat and movement corridors for wildlife.

The property has not been identified as part of a major regional movement corridor (NCCDPD, 2005), but the ridges and stream drainages are undoubtedly used by a wide variety of resident wildlife with home ranges small enough to be contained within the property. The property has the potential to support full or partial home ranges and transient movement of at least some individual mid-sized and large mammal species such as northern raccoons (*Procyon lotor*), gray fox (*Urocyon cinereoargenteus*), bobcat (*Lynx rufus*), coyote, and mule deer.

Small wildlife corridors onsite include the drainages and associated vegetation, as well as the wetland area below the spring. Wildlife corridors are discussed further in **Impact** and **Mitigation Measure 4.3-4**.

4.3.4-5 WILDLIFE

Wildlife was identified onsite during the biological surveys by one or more of the following: calls, scat, remains, or direct sight (Kjeldsen, 2011). Animals with potential to occur on the property and to which special regulatory status applies are discussed in the following section. Vegetation on the site represents potential nesting habitat for migratory bird species and raptors (discussed in **Impact** and **Mitigation Measure 4.3-7**) as well as bats (discussed in **Impact** and **Mitigation Measure 4.3-10**). For a complete list of animal species observed onsite, see Kjeldsen (2011) (**Appendix D**).

4.3.4-6 SPECIAL STATUS SPECIES

Special status species are those considered to be of management concern to state and/or federal resource agencies, including species:

- Listed as endangered, threatened or candidate for listing under the Federal Endangered Species Act.
- Listed as endangered, threatened, rare or proposed for listing under the California Endangered Species Act of 1970.
- Designated as endangered or rare, pursuant to California Fish and Game Code (§ 1901).

- Designated as fully protected, pursuant to California Fish and Game Code (§§ 3511, 4700 or 5050).
- Designated as species of special concern by the CDFG.
- Meeting the definitions of rare or endangered under CEQA.
- Listed as "locally rare" special status plant species in the Napa County Baseline Data Report (NCBDR) (CNPS Lists 3 and 4), including plants ranked by the CNPS to be "rare, threatened or endangered in California" (Lists 1A, 1B and 2) (NCCDPD, 2005).

The 2010 field surveys performed by Kjeldsen targeted special status species that were identified as having the potential to occur based upon: distribution, soils, habitat suitability and documented occurrences within five miles of the property (refer to **Appendix D**; Kjeldsen, 2011). Special status species were targeted based on records obtained from the CNDDB, CNPS and USFWS, and by verbal communication with CDFG personnel. The results of these surveys are discussed further in the Biological Resources Report (Kjeldsen, 2011), which is included as **Appendix D**.

According to Kjeldsen (2011) (**Appendix D**), special status species including: 16 plant species, one invertebrate species, one fish species, one amphibian species, two bird species, and three mammal species have the potential to occur within the property owing to distribution, soils, habitat suitability and documented occurrences within five miles of the property. The list of potentially occurring special-status species shown in **Table 4.3-2** below has been adapted from Kjeldsen (2011) to show all special-status species with potential to occur onsite, including those that have not been previously documented within five miles of the property. The CDFG recommends that all CNPS List 1A, 1B, and 2 plant species be addressed for CEQA projects (CDFG, 2012). AES considered CNPS List 3 and 4 species as well since these such species are considered locally rare in Napa County and are recommended to be addressed per the NCBDR (see Supplemental Biological Survey Memorandum (AES, 2012) in **Appendix D**). Based on further review and analysis by AES, the property contains suitable habitat for 17 plant species, three bird species, one amphibian species, and two mammal species as shown in **Table 4.3-2**. These species are discussed further below in **Sections 4.3.4-7** through **4.3.4-10**.

The results of the Supplemental Biological Survey (AES, 2012), which was conducted to ensure that all of the local plants of concern to Napa County were specifically surveyed for, found that while the property provides suitable or marginally suitable habitat for some special status plant species as discussed in **Table 4.3-2** below, none of these plants were observed on the site during the biological surveys performed by Kjeldsen in 2010 and 2011 or in the supplemental survey performed by AES and Environmental Resource Management in August of 2011 (AES, 2012; **Appendix D**). The biological surveys conducted by Kjeldsen Biological Consulting and AES/Environmental Resource Management were floristic in nature and covered the entire property. In summary, this supplemental analysis concurs with the

findings presented in the final Biological Resources Report (Kjeldsen, 2011) that none of the special status species presented in Kjeldsen (2011) and none of those of local concern to Napa County surveyed for by AES/Environmental Resource Management (2011) as presented below in **Table 4.3-2** are present on the property.

This Supplemental Biological Survey Memorandum is included in this EIR under **Appendix D** as the supplemental survey methodology and findings documentation satisfy the standards and requirements of the Napa County General Plan (General Plan; Napa County, 2008), including those outlined in the NCBDR (2005), in relation to special-status plant species (including those listed as CNPS List 3 and 4) and vegetation communities.

TABLE 4.3-2
SPECIAL STATUS SPECIES WITH THE POTENTIAL TO OCCUR ON THE PROPERTY

SCIENTIFIC NAME COMMON NAME	FEDERAL/STATE /OTHER STATUS	DISTRIBUTION	HABITAT REQUIREMENTS	HABITAT PRESENT	SPECIES OBSERVED ONSITE	PERIOD OF IDENTIFICATION
PLANTS						
Amorpha californica* var. *napensis Napa false indigo	--/--/1B.2	Monterey, Marin, Napa, and Sonoma counties.	Broad-leaf upland forest (openings), chaparral, and cismontane woodland. Elevations from 120-2,000 meters.	Yes	No	April - July
Amsinckia lunaris Bent-flowered fiddleneck	--/--/1B.2	Alameda, Contra Costa, Colusa, Lake, Marin, Napa, San Benito, Santa Clara, Santa Cruz, San Mateo, and Yolo counties.	Coastal bluff scrub, Cismontane woodland, and Valley and foothill grassland. Elevations; 3-500 meters.	Yes	No	March - June
Astragalus claranus *Clara Hunt's milk-vetch*	FE/ST/1B.1	Napa and Sonoma counties.	Openings in chaparral, Cismontane woodland, valley and foot hill grassland in serpentine or rocky clay or volcanic soils. Elevations from 75-275 meters.	Yes	No	March - May
Balsamorhiza macrolepis* var. *macrolepis Big-scale balsamroot	--/--/1B.2	Alameda, Butte, Colusa, Lake, Mariposa, Napa, Placer, Santa Clara, Solano, Sonoma, and Tehama counties.	Chaparral, cismontane woodland, valley and foothill grassland/ sometimes serpentinite. Elevations from 90-1,555 meters.	Yes	No	March - June
Brodiaea californica* var. *leptandra Narrow-anthered California brodiaea	--/--/1B.2	Lake, Napa and Sonoma counties.	Broadleaf upland forest, chaparral valley and foothill grassland, and lower montane coniferous forest; rocky volcanic soil. Elevations from 110-915 meters.	Yes	No	May - July
Ceanothus confusus Rincon Ridge ceanothus	--/--/1B.1	Lake, Mendocino, Napa, and Sonoma counties.	Closed-cone coniferous forest, Chaparral, and Cismontane woodland/volcanic or serpentinite. Elevations; 75-1065 meters.	Yes	No	February - June
Ceanothus purpureus Holly-leaved ceanothus	--/--/1B.2	Napa, Solano and Sonoma counties.	Chaparral and cismontane woodlands often with volcanic or rocky soils. Elevations from 120-640 meters.	Yes	No	February - June

SCIENTIFIC NAME COMMON NAME	FEDERAL/STATE /OTHER STATUS	DISTRIBUTION	HABITAT REQUIREMENTS	HABITAT PRESENT	SPECIES OBSERVED ONSITE	PERIOD OF IDENTIFICATION
Centromadia parryi* ssp. *parryi Pappose tarplant	--/--/1B.2	Butte, Colusa, Glenn, Lake, Napa, San Mateo, Solano, and Sonoma counties.	Vernally mesic areas in grasslands, meadows and seeps, coastal salt marsh; often on alkaline sites. Elevations from 2-420 meters.	Yes	No	May - November
Erigeron biolettii[1] Biolett's erigeron; streamside daisy	--/--/3[1]	Humboldt, Mendocino, Marin, Napa, Solano and Sonoma.	Broadleaf upland forest, cismontane woodland, and North Coast coniferous forest in rocky, mesic areas. Elevations from 30-1,100 meters.	Yes	No	June - September
Lasthenia burkei Burke's goldfields	FE/CE/1B	Lake, Mendocino, Napa and Sonoma counties.	Meadows and seeps (mesic) and Vernal pools. Elevations range from 15-600 meters.	Yes	No	April - June
Leptosiphon jepsonii Jepson's leptosiphon	--/--/1B.2	Lake, Napa and Sonoma counties.	Chaparral and cismontane woodland, usually volcanic. Elevations from 100-500 meters.	Yes	No	March - May
Limnanthes floccosa ssp. floccosa Woolly meadowfoam	--/--/4.2	Butte, Lake, Lassen, Napa, Shasta, Siskiyou, Tehama, and Trinity counties.	Vernally mesic chaparral, cismontane woodland, valley and foothill grassland, and vernal pools. Elevations from 60-1,335 meters.	Yes	No	March - June
Lupinus sericatus Cobb Mountain lupine	--/--/1B.2	Colusa, Lake, Napa, and Sonoma counties.	Broad-leafed upland forest, Chaparral, Cismontane woodland, and Lower montane coniferous forest. Elevations range from 275-1,525 meters.	Yes	No	March - June
Micropus amphibolus Mount Diablo cottonweed	--/--/3.2[1]	Alameda, Contra Costa, Colusa, Lake, Monterey, Marin, Napa, Santa Barbara, Santa Clara, Santa Cruz, San Joaquin, San Luis Obispo, Solano, and Sonoma counties.	Broad-leaved upland forest (openings), Chaparral, Cismontane woodland, and Valley and foothill grassland, in rocky soils. Elevations from 45-825 meters.	Yes	No	March - May
Navarretia leucocephala ssp. bakeri Baker's navarretia	--/--/1B.1	Colusa, Glenn, Lake, Mendocino, Marin, Napa, Solano, Sonoma, Sutter, Tehama, and Yolo counties.	Cismontane woodland, lower montane coniferous forest, meadows and seeps, valley and foothill grassland, vernal pools/mesic. Elevations from 275-1,525 meters.	Yes	No	April - July

SCIENTIFIC NAME COMMON NAME	FEDERAL/STATE /OTHER STATUS	DISTRIBUTION	HABITAT REQUIREMENTS	HABITAT PRESENT	SPECIES OBSERVED ONSITE	PERIOD OF IDENTIFICATION
Trichostema ruygtii Napa bluecurls	--/--/1B.2	Napa County, possibly adjacent Solano County.	Chaparral, cismontane woodland, lower montane coniferous forest, valley and foothill grassland; vernally mesic thin soils and vernal pools. Elevations from 30-680 meters.	Yes	No	June - October
Viburnum ellipticum Oval-leaved viburnum	--/--/2.3	Contra Costa, El Dorado, Fresno, Glenn, Humboldt, Mendocino, Napa, Placer, Shasta, and Sonoma counties. Also occurs in Oregon and Washington.	Chaparral, cismontane woodland and lower montane coniferous forest. Elevations from 215-1,400 meters.	Yes	No	May - June
ANIMALS						
Birds						
Elanus leucurus white-tailed kite	--/CFP/--	Permanent resident of coastal and valley lowlands.	Nests in dense oak, willow, or other tree stands near open foraging areas. Hunts in herbaceous lowlands with variable tree growth.	Yes	No	Year-round peak nesting is from May - August
Progne subis purple martin	--/CSC/--	Local summer resident in wooded low-elevation habitats throughout California; rare migrant in spring and fall, absent in winter. In the south, now only a rare and local breeder on the coast and in interior mountain ranges.	Inhabits open forests, woodlands, and riparian areas in breeding season. Found in a variety of open habitats during migration, including grassland, wet meadow, and fresh emergent wetland, usually near water. Nests in conifer stands, often in woodpecker holes. Uses valley foothill and montane hardwood and conifer, and riparian habitats.	Yes; marginal nesting habitat	No	March - August

SCIENTIFIC NAME COMMON NAME	FEDERAL/STATE /OTHER STATUS	DISTRIBUTION	HABITAT REQUIREMENTS	HABITAT PRESENT	SPECIES OBSERVED ONSITE	PERIOD OF IDENTIFICATION
Styx occidentalis caurina Northern spotted owl	FT/--/--	Geographic range of subspecies *caurina* extends from southwestern British Colombia to northwestern California south to San Francisco. The breeding range includes the Cascade Range, and the North Coast Ranges.	Resides in mixed conifer, redwood, and Douglas-fir habitats, from sea level up to approximately 2300 meters. Appear to prefer old-growth forests, but use of managed (previously logged) lands is not uncommon. Owls do not appear to use logged habitat until approximately 60 years after logging unless some larger trees or snags remain after logging. Nesting habitat is a tree or snag cavity, or the broken top of a large tree. Requires a nearby, permanent source of water. Foraging habitat consists of any forest habitat with sufficient prey (e.g. flying squirrels, mice, and voles).	Yes; nesting and foraging habitat	No	All Year
Amphibians						
Rana boylii Foothill Yellow Legged Frog	--/CSC/SC	Ranges from northern Oregon west of the Cascades south along the coast to the San Gabriel mountains, and south along the western side of the Sierra Nevada mountains to Kern county; known populations from Lake County.	Found in woodland, chaparral, and forests associated with slow and gravelly streams and rivers.	Yes	No	March - June (breeding) July - September (non-breeding)

SCIENTIFIC NAME COMMON NAME	FEDERAL/STATE /OTHER STATUS	DISTRIBUTION	HABITAT REQUIREMENTS	HABITAT PRESENT	SPECIES OBSERVED ONSITE	PERIOD OF IDENTIFICATION
Mammals						
Antrozous pallidus pallid bat	--/CSC/--	Locally common species at low elevations. Throughout California except for the high Sierra Nevada from Shasta to Kern counties, and the northwestern corner of the state from Del Norte and western Siskiyou counties to northern Mendocino County.	Habitats occupied include grasslands, shrublands, woodlands and forests from sea level through mixed conifer forests below 2,000 meters. The species is most common in open, dry habitats with rocky areas for roosting. Roosts also include cliffs, abandoned buildings, bird boxes, and under bridges.	Yes; roosting and foraging habitats	No	March - September
Corynorhinus townsendii Townsend's big-eared bat	--/CSC/Red	Throughout California, excluding subalpine and alpine habitats. Through Mexico to British Columbia and the Rocky Mountain states. Also occurs in several regions of the central Appalachians.	Requires caves, mines, tunnels, buildings, or other human-made structures for roosting. Hibernation sites must be cool and cold, but above freezing.	Yes; foraging habitat only	No	March - September

[1]This species is not documented within the CNDDB because it is not listed pursuant through the CEQA review process. The CDFG recommends that all CNPS List 1B and 2 plant species be addressed for CEQA projects. Though it is not required for the CEQA review process, CNPS recommends that List 3 and List 4 plant species also be considered. AES considered CNPS List 3 and 4 species as well as species that are considered Locally Rare in Napa County.

STATUS CODES
FEDERAL: U.S. Fish and Wildlife Service and National Marine Fisheries Service
FE Listed as Endangered by the Federal Government
FT Listed as Threatened by the Federal Government
BCC Fish and Wildlife Service Birds of Conservation Concern
SSC Fish and Wildlife Service Species of Special Concern
STATE: California Department of Fish and Game
CE Listed as Endangered by the State of California
CT Listed as Threatened by the State of California
CSC California Species of Special Concern
CFP California Fully Protected Species
OTHER:
CNPS: California Native Plant Society
List 1B Plants rare or endangered in California and elsewhere
List 2 Plants rare or endangered in California, but more common elsewhere
List 3 Plants for which more information is needed
List 4 Plants of limited distribution
Threat Ranks
0.1-Seriously threatened in California (high degree/immediacy of threat)

0.2-Fairly threatened in California (moderate degree/immediacy of threat)
0.3-Not very threatened in California (low degree/immediacy of threats or no current threats known)
Months in parenthesis are uncommon.

Western Bat Working Group

Red	Bats imperiled or are at high risk of imperilment.
Yellow	Bats whose status warrants closer evaluation and are threatened with imperilment.

Sources: USFWS, 2007b; CDFG, 2003; CNDDB, 2011a; CDFG 2011b; CNPS, 2011; Kjeldsen, 2011; Western Bat Working Group, 2007; Berner, et al., 2003.

Species were dismissed from further consideration (refer to **Appendix E**) and analysis in this **Section 4.3** of this EIR if:

1) Their distributions fall outside the property;
2) The species has been recently delisted or has no state or federal status (but may be tracked by the CNDDB); and/or
3) The property does not provide suitable habitat and/or soils for the species.

No critical habitats listed by the USFWS occur within the property. However, critical habitat for the central California coast steelhead ESU occurs less than one mile south of the property in Ritchie Creek.

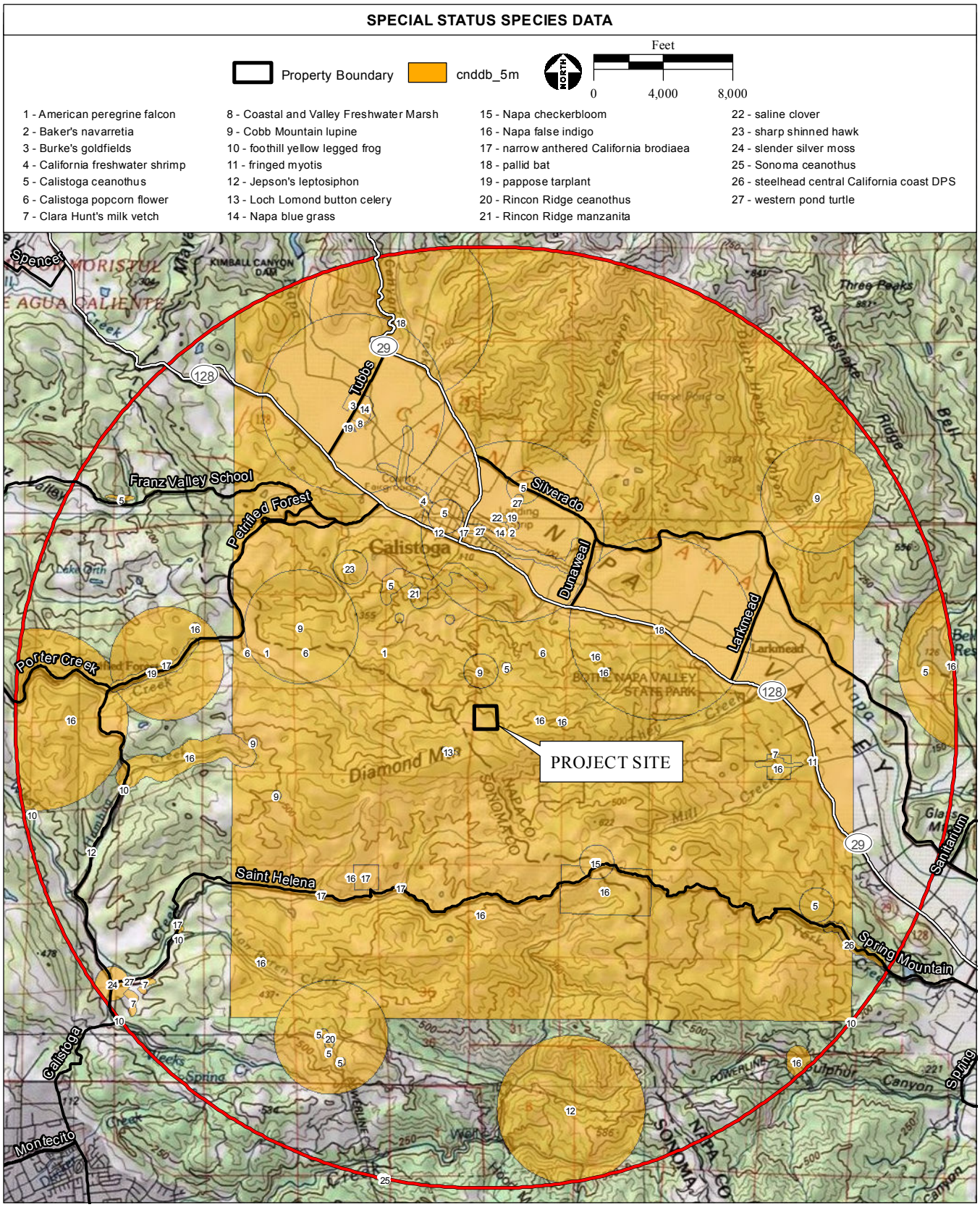
In addition to the species list in **Table 4.3-2**, the CNDDB (CDFG, 2003) was queried and occurrences of special status species were plotted in relation to the property boundary using Geographical Information System (GIS) software (**Figure 4.3-5**). To aid in the analysis of the potential for special status species to occur on the property, a five mile radius circle centered on the property is generally used to identify known local occurrences of such species. Though this is a valuable tool for determining the likelihood of a special status species to occur in the vicinity of a given project, absence of a known record within five miles of the property does not preclude the possibility of the species' presence onsite. Individual dispersal mechanisms for special status species such as overland or aerial migration and various seed dispersal methods are also taken into account when determining the likelihood of occurrence in a region.

The CNNDB reported 26 special status species and one sensitive habitat within a five-mile radius of the project area. Of these, 14 have the potential to occur onsite due to the presence of suitable habitat. These species are shown in **Table 4.3-2** and are discussed in detail below and in **Appendix E**. The remaining 12 species recorded by the CNDDB within five miles of the property were dismissed from further consideration and analysis from this EIR on account of the criteria listed above as they do not have the potential to occur on the property (see **Appendix E**). Coastal and Valley Freshwater Marsh was the only sensitive habitat type recorded in the CNDDB within a five mile radius of the property; however, it does not occur on the property (Kjeldsen, 2011).

Descriptions of target species that have the potential to occur onsite are provided below (refer to **Table 4.3-2**).

4.3.4-7 SPECIAL STATUS PLANTS

All of the special status plant species identified with the potential to occur on the property, excluding those for which no suitable habitat or soils were present on the property, are



SOURCE: "Healdsburg, CA" USGS 100k Topographic Quadrangle, Mt. Diablo Baseline & Meridian; AES, 2011

Figure 4.3-5

CNDDB 5-Mile Radius Results

described briefly below. The CDFG requires that all CNPS List 1B and 2 plant species be addressed for CEQA projects. Although not required for the CEQA review process, CNPS recommends that List 3 and List 4 plant species also be considered because their status may change and other local and/or regional regulations may require evaluation.

Bryophytes

Bryophytes (more generally known as moss and liverworts) could occur with most habitats present within the property. Distributions are not well known for special status bryophytes; however, the CNDDB and CNPS searches for plants revealed one record for slender silver moss (*Anomobryum julaceum*, CNPS List 1.B) within a five mile radius of the property. This record occurs approximately five air miles southwest of the property in Sonoma County (CNDDB, 2003). Several of the habitat associations of slender silver moss (seasonally exposed moist soil of road banks in grasslands and woodlands) are present on the site, and the surveys conducted by Kjeldsen (2011) included collections for bryophytes (**Appendix D**). During the surveys, suitable habitat for bryophytes such as moist banks of road cuts, drainages and seeps, grasslands, rock outcrops and trees were examined. No special status bryophytes were found on the site during the biological surveys (**Appendix D**).

Napa false indigo (*Amorpha californica* var. *napensis*)

Pea Family (Fabaceae)
Federal Status – None
State Status – None
Other – CNPS 1B.2

Napa false indigo is a nearly glabrous deciduous shrub distinguished by prickle-like glands on the main axis of compound leaves and a sessile gland terminating leaflet midribs; the raceme of small purple flowers have showy exerted yellow stamens. The period of identification is April through July. This plant is found in cismontane woodland, chaparral, and openings of broadleaved upland forest from 120 to 2,000 meters amsl. Napa false indigo is known from Monterey, Marin, Napa and Sonoma counties.

There are 14 occurrences of this species within a five mile radius of the property (**Figure 4.3-5**). The nearest is located approximately 0.5 miles due east of the property (CNDDB Occurrence Number 41). Two colonies of this species were mapped in chaparral intergrading with mixed evergreen forest in 2002 (CNDDB, 2003). The property provides suitable habitat for Napa false indigo within oak woodland habitats and along the edge of the Douglas Fir Forest alliance on site. Napa false indigo was not observed during of the focused biological surveys of the property, which were conducted within the appropriate period of identification for this species (Kjeldsen, 2011).

Bent-flowered fiddleneck *(Amsinckia lunaris)*
Borage Family (Boraginaceae)
Federal Status – None
State Status – None
Other – CNPS List 1B.2

Bent-flowered fiddleneck is an annual herb occurring in coastal bluff scrub, cismontane woodland, and valley and foothill grassland communities at elevations that range from three to 500 meters amsl. This species blooms from March through June. The known range of bent-flowered fiddleneck includes Alameda, Contra Costa, Colusa, Lake, Marin, Napa, San Benito, Santa Clara, Santa Cruz, San Mateo, and Yolo counties (CNPS, 2011).

There are no documented occurrences of this species within five miles of the property (CNDDB, 2003). However, the property provides suitable habitat for bent-flowered fiddleneck within annual grassland and oak woodlands on site. This species was not observed during of the focused biological surveys of the property, which were conducted within the appropriate period of identification for this species (Kjeldsen, 2011).

Clara Hunt's milkvetch (*Astragalus claranus*)
Pea Family (Fabaceae)
Federal Status – Endangered
State Status – Threatened
Other – CNPS 1B.1

Clara Hunt's milkvetch is a slender, sparse-leaved annual with up to nine leaflets per leaf and two to 14 white purple-tipped flowers (Hickman, 1993b). This species is reported from Napa and Sonoma counties on rocky, clay, or serpentine soils in sparsely vegetated openings within blue oak woodland, chaparral, and grassland communities, at elevations of 320 to 700 meters amsl. The period of identification is March through May. Known from only five occurrences, Clara Hunt's milkvetch was proposed for Federal listing in August of 1995 and was listed as Endangered in October 1997 (U.S. Federal Register, 1997). Currently, this species does not have a recovery plan or designated critical habitat (USFWS, 2009). CDFG listed this species as Threatened in 1990, and its status was determined to be "Stable to Declining" by a CDFG assessment in 1999 (CDFG, 2003). It is threatened by urbanization, recreational development, grazing, and non-native plants.

There are three recorded occurrences of this species within a five mile radius of the property (**Figure 4.3-5**). The closest occurrence of this species is documented southeast of Calistoga, approximately four miles southeast of the property (CNDDB Occurrence Number 7). The annual grassland within the property is suitable habitat for this species. Clara Hunt's milkvetch was not observed during years of focused biological surveys of the

property, which were conducted within the appropriate period of identification for this species (Kjeldsen, 2011).

Big-Scale Balsamroot (*Balsamorhiza macrolepis* var. *macrolepis*)
Composite Family (Asteraceae)
Federal Status – None
State Status – None
Other – CNPS 1B.2

Big-scale balsamroot is a perennial with basal, pinnately divided leaves that produces one head per inflorescence. The flower head consists of yellow ray and disk flowers (Hickman, 1993). Suitable habitat includes chaparral, woodland, and open grassland, and is generally found in grassy slopes and valleys. This species can occur on both serpentine and non-serpentine soils. Its range includes the Sierra Nevada Foothills, Sacramento Valley, and San Francisco Valley regions of the California Floristic Province. Big-scale balsamroot blooms from March through June.

There are no recorded occurrences of big-scale balsamroot within five miles of the property (CNDDB, 2003). However, the annual grassland within the property is suitable habitat for this species. Big-scale balsamroot was not observed during the focused biological surveys of the property, which were conducted within the appropriate period of identification for this species (Kjeldsen, 2011).

Narrow-Anthered California Brodiaea (*Brodiaea californica* var. *leptandra*)
Lily Family (Liliaceae)
Federal Status – None
State Status – None
Other – CNPS 1B.2

Narrow-anthered California brodiaea can be distinguished from the more common harvest brodiaea (*Brodiaea elegans* ssp. *elegans*) by checking the staminode character traits. Narrow-anthered California brodiaea has pale lilac to white flowers, and with a stem greater than 50 centimeters tall (Hickman, 1993b). Narrow-anthered California brodiaea typically occurs from 110 to 915 meters in elevation in broadleaf upland forest, chaparral, cismontane woodland, lower montane coniferous forest, and valley and foothill grassland on generally thin rocky soils, of volcanic serpentinite origin, often along drainages. The ideal period of identification is from May through July. It is found in Lake, Napa, and Sonoma counties.

There are six recorded occurrences of this species within a five mile radius of the property (**Figure 4.3-5**). The nearest records of this species are along St. Helena Road in areas of chaparral (CNDDB Occurrence Numbers 27-29), within 3.5 miles of the property. The

property provides suitable habitat for narrow-anthered California brodiaea within the annual grassland and oak woodland. Narrow-anthered California brodiaea was not observed during the focused biological surveys of the property, which were conducted within the appropriate period of identification for this species (Kjeldsen, 2011).

Rincon Ridge Ceanothus (*Ceanothus confusus*)
Buckthorn Family (Rhamnaceae)
Federal Status – None
State Status – None
Other – CNPS List 1B.1

Rincon Ridge ceanothus is a prostrate to decumbent shrub that occurs in closed-cone coniferous forest, chaparral, and cismontane woodland communities at elevations that range from 75 to 1,065 meters amsl. It frequently occurs on volcanic and/or serpentinite substrates. This species blooms from February through June. The known range of Rincon Ridge ceanothus includes Lake, Mendocino, Napa, and Sonoma counties. This species is noted for having leaves that are less than two centimeters (cm) long with toothed margins and fruits that are typically five mm long. The fruits are bright red with slender upright horns that are not wrinkled, but have minute ridges (CNPS, 2011).

There is one recorded occurrence of this species within five miles of the property (**Figure 4.3-5**). The nearest records of this species were documented along St. Helena Road in areas of chaparral (CNDDB Occurrence Numbers 27-29), within four miles of the property. The property provides suitable habitat for this species within the mixed coniferous forest. Rincon Ridge ceanothus was not observed during the focused biological surveys of the property, which were conducted within the appropriate period of identification for this species (Kjeldsen, 2011).

Holly-leaved Ceanothus (*Ceanothus purpureus*)
Buckthorn Family (Rhamnaceae)
Federal Status – none
State Status – none
Other – CNPS 1B.2

Holly-leaved ceanothus is an evergreen shrub occurring in chaparral and volcanic, rocky cismontane woodland habitats from 120 to 640 meters amsl. Blooming occurs from February through June. The known range of this species includes Napa, Shasta, Solano, Sonoma, and Trinity Counties (CNPS, 2011).

There are no recorded occurrences of holly-leaved ceanothus within five miles of the property (CNDDB, 2003). However, the oak woodlands within the property is suitable

habitat for this species. Holly-leaved ceanothus was not observed during the focused biological surveys of the property, which were conducted within the appropriate period of identification for this species (Kjeldsen, 2011).

Pappose tarplant (*Centromadia parryi* ssp. *parryi*)
Composite Family (Asteraceae)
Federal Status – None
State Status – None
Other – CNPS 1B.2

Pappose tarplant is an annual with radiate heads, phyllaries in one series subtending the ray flowers, and the yellow ray and disc flowers have yellow anthers. It generally occurs in alkaline or clay soils in chaparral, coastal prairie, meadows and seeps, marshes and swamps (coastal salt), and valley and foothill grassland habitats (vernally mesic). This species blooms from May to October and is found at elevations from two to 420 meters amsl. Extant records exist in Butte, Colusa, Glenn, Lake, Napa, San Mateo, Solano, and Sonoma counties (CNPS, 2011). It is considered extirpated in Santa Cruz and Solano counties. It is referred to as *Hemizonia parryi* ssp. *parryi* in the Jepson Manual of the Higher Plants of California (Hickman, 1993a).

There are three recorded occurrences of this species within five miles of the property (**Figure 4.3-5**). The nearest record of this species was documented in 1950 approximately three miles north of the property in Calistoga (CNDDB Occurrence Number 15). This species has recently been upgraded from a CNPS List 2 species because it may not be as abundant as previously thought. Appropriate habitat exists on site for this plant in grassland habitats. Pappose tarplant was not observed during the focused biological surveys of the property, which were conducted within the appropriate period of identification for this species (Kjeldsen, 2011).

Streamside Daisy (*Erigeron bioletti*)
Composite Family (Asteraceae)
Federal Status – none
State Status – none
Other – CNPS List 3

Streamside daisy is a perennial herb occurring in broadleafed upland forest, cismontane woodland, and on rocky, mesic substrates within north coast coniferous forest habitats. It grows at elevations between 30 and 1,100 meters amsl. Blooming take place from June through October. The known range of this species includes Humboldt, Mendocino, Marin, Napa, Solano and Sonoma Counties (CNPS, 2011).

There are no recorded occurrences of this species within five miles of the property (CNDDB, 2003). However, the oak woodlands within the property provide suitable habitat for this species. Streamside daisy was not observed during the focused biological surveys of the property, which were conducted within the appropriate period of identification for this species (Kjeldsen, 2011).

Burke's Goldfields (*Lasthenia burkei*)
Composite Family (Asteraceae)
Federal Status – Endangered
State Status – Endangered
Other – CNPS List 1B.1

Burke's goldfields are annual herbs that occur in wet habitats including meadows and seeps and in vernal pools at elevations that range from 15 to 600 meters amsl. This species blooms from April through July. It is known for having an unusual pappus that is composed of one long awn and several short scales (CNPS, 2011). The known range of this species includes Lake, Mendocino, napa, and Sonoma counties. Critical habitat has not been designated for this species and it does not have a recovery plan.

There is only one recorded occurrences of this species within five miles of the property (**Figure 4.3-5**). However, the wet area within the property provide suitable habitat for this species. Burke's goldfields was not observed during the focused biological surveys of the property, which were conducted within the appropriate period of identification for this species (Kjeldsen, 2011).

Jepson's leptosiphon (*Leptosiphon jepsonii*)
Phlox Family (Polemoniaceae)
Federal Status – None
State Status – None
Other – CNPS 1B.2

Jepson's leptosiphon is an annual herb found in grassland habitat without volcanic soils. The blooming period ranges from April to May. Jepson's leptosiphon is known to occur in Lake, Napa, and Sonoma counties (CNPS, 2011).

There are three recorded observances of this species within a five mile radius of the property (**Figure 4.3-5**). The nearest extant record of this species was documented in 2011 approximately 4.5 miles southwest of the property along Humbug Creek in Sonoma County (CNDDB Occurrence Number 23). The property provides suitable habitat for Jepson's leptosiphon within the annual grassland habitat. Jepson's leptosiphon was not observed

during the focused biological surveys of the property, which were conducted within the appropriate period of identification for this species (Kjeldsen, 2011).

Wooly meadowfoam (*Limnanthes floccosa ssp. floccose*)
Meadowfoam Family (Limnanthaceae)
Federal Status – None
State Status – None
Other – CNPS 4.2

Wooly meadowfoam is an annual herb occurring in chaparral, cismontane woodland, valley and foothill grassland, and in vernally mesic vernal pool habitats. It has been found at elevations ranging from 60 to 1095 meters amsl. This species blooms from March through May and will uncommonly continue blooming into June. Its known range includes Butte, Lake, Lassen, Napa, Shasta, Siskiyou, Tehama, and Trinity Counties. It is also found in Oregon (CNPS, 2011).

There are no recorded occurrences of this species within five miles of the property (CNDDB, 2003). However, the wet area within the property provide suitable habitat for this species. Wooly meadowfoam was not observed during the focused biological surveys of the property, which were conducted within the appropriate period of identification for this species (Kjeldsen, 2011).

Cobb Mountain Lupine (*Lupinus sericatus*)
Pea Family (Fabaceae)
Federal Status – None
State Status – None
Other – CNPS List 1B.2

Cobb Mountain lupine is a perennial herb occurring in broadleaf upland forest, chaparral, cismontane woodland, and lower montane coniferous forest communities at elevations that range from 275 to 1,525 meters amsl. This species blooms from March through June. The range of Cobb Mountain lupine includes Colusa, Lake, Napa, and Sonoma counties (CNPS, 2011). This species is noted for having peduncles that are eight to 15 centimeters long, leaves that are covered with short, appressed hairs, and purple petals (Hickman, 1993b).

There are five recorded occurrences of this species within five miles of the property (**Figure 4.3-5**). However, the oak woodlands and coniferous forests within the property provide suitable habitat for this species. Cobb's Mountain lupine was not observed during the focused biological surveys of the property, which were conducted within the appropriate period of identification for this species (Kjeldsen, 2011).

Mount Diablo Cottonweed (*micropus amphibolus*)
Composite Family (Asteraceae)
Federal Status – None
State Status – None
Other – CNPS List 3.2

Mount Diablo cottonweed is an annual herb from the composite family (Asteraceae). It occurs in broadleaf upland forest, chaparral, cismontane woodland, and valley and foothill grassland (rocky) habitats at elevations that range from 45 to 825 meters amsl. This species blooms from March through May. The range of Mount Diablo cottonweed includes Alameda, Contra Costa, Colusa, Lake, Monterey, Marin, Napa, Santa Barbara, Santa Clara, Santa Cruz, San Joaquin, San Luis Obispo, Solano, and Sonoma counties (CNPS, 2011).

There are no recorded occurrences of this species within five miles of the property (CNDDB, 2003). However, the oak woodlands and annual grasslands within the property provide suitable habitat for this species. Mount Diablo cottonweed was not observed during the focused biological surveys of the property, which were conducted within the appropriate period of identification for this species (Kjeldsen, 2011).

Baker's navarretia (*Navarretia leucocephala* ssp. *bakeri*)
Phlox Family (Polemoniaceae)
Federal Status – None
State Status – None
Other – CNPS 1B.1

Baker's navarretia is an annual herb differentiated from the other subspecies because it has white corollas that are greater than or equal to the calyx, calyx lobes that are generally entire, ascending branches, and generally erect stems (Hickman, 1993b). It is found in cismontane woodland, lower montane coniferous forest, meadows and seeps, valley and foothill grassland, and mesic vernal pools from 275 to 1,525 meters amsl. The blooming period for this species is from April through July. Baker's navarretia is known from Colusa, Glenn, Lake, Mendocino, Marin, Napa, Solano, Sonoma, Sutter, Tehama, and Yolo counties (CNPS, 2011).

The nearest occurrence of this species is approximately 2.5 miles northeast of the property in Calistoga. The property provides suitable habitat for Baker's navarretia within the wetland features, the annual grassland, and oak woodland habitats. Baker's navarretia was not observed during the focused biological surveys of the property, which were conducted within the appropriate period of identification for this species (Kjeldsen, 2011).

Napa Bluecurls (*Trichostema ruygtii*)
Legume Family (Fabaceae)
Federal Status – None
State Status – None
Other – CNPS List 1B.2

Napa bluecurls is an annual herb found in chaparral, cismontane woodland, lower montane coniferous forest, valley and foothill grassland, and vernal pools. It is known to occur at elevations ranging from 30 to 680 meters amsl. The range of this species includes Lake, Napa, and Solano counties. This plant blooms from June to October.

There are no recorded occurrences of this species within five miles of the property (CNDDB, 2003). However, the oak woodlands and annual grasslands within the property provide suitable habitat for this species. Napa bluecurls was not observed during the focused biological surveys of the property, which were conducted within the appropriate period of identification for this species (Kjeldsen, 2011).

Oval-leaved viburnum (*Viburnum ellipticum*)
Caprifoliaceae family (Caprifoliaceae)
Federal Status – None
State Status – None
Other – CNPS List 2.3

The oval-leaved viburnum is a deciduous shrub in the Caprifoliaceae family. This species has white flowers clustered in inflorescences two inches in diameter. Its leaves are elliptic, round, or cordate and have coarsely dentate margins. Suitable habitat includes chaparral, cismontane woodland, and lower montane coniferous forest, though it occurs most often in chaparral or yellow-pine forest habitats. It ranges in elevation from 215 to 1,400 meters above msl. It is known to occur in Contra Costa, El Dorado, Fresno, Glenn, Humboldt, Mendocino, Napa, Placer, Shasta, Sonoma, and Tehama counties as well as Oregon and Washington. This species' blooming period is typically from May through June (CNPS, 2011).

There are no recorded occurrences of this species within five miles of the property (**Figure 4.3-5**). However, the Douglas Fir forest within the property provides suitable habitat for this species. Oval-leaved viburnum was not observed during the focused biological surveys of the property, which were conducted within the appropriate period of identification for this species (Kjeldsen, 2011).

4.3.4-8 FORMERLY LISTED AND SPECIAL STATUS BIRDS

While no special status bird species were observed on the property during the 2010 and 2011 biological surveys conducted by Kjeldsen Biological Consulting, Inc., suitable nesting and/or foraging habitat exists for several species. Bird species from **Table 4.3-2** are discussed briefly below.

Formerly Listed Species

A few raptors formerly listed as California species of special concern have been downgraded in recent years to "species to watch," since their populations are thought to have stabilized (Shuford and Gardali 2008). Some of these raptors have the potential to occur on the property, including sharp-shinned hawk (*Accipiter striatus*), Cooper's hawk (*Accipiter cooperii*), ferruginous hawk (*Buteo regalis*), and golden eagle (*Aquila chrysaetos*). Many of these species are known to nest in southern Napa County. The sharp-shinned hawk and ferruginous hawk are likely to occur primarily as migrants and/or winter visitors.

Sharp-shinned hawk occurs in a wide range of woodland and forest types dominated by conifers and broad-leaved trees (especially oaks). These birds surprise and capture all their prey from cover or while flying quickly through dense vegetation. They are adept at navigating dense thickets. The great majority of this hawk's prey is small birds. They often pluck the feathers off their prey on a post or other perch. Sharp-shinned hawks will construct a stick nest in a large conifer or dense group of deciduous trees. The incubation period for eggs is thought to average at about 30 days. After hatching, the young are brooded for 16 to 23 days by the female, while the male defends the territory and catches food. The young fledge at about a month old and rely on their parents for feeding and protection another four weeks. The nesting sites and breeding behavior of sharp-shinned hawks are generally secretive, in order to avoid the predation of larger raptors, such as the northern goshawk and the Cooper's hawk.

The **Cooper's hawk** is adapted for hunting prey in flight through woodland. Small birds make up the majority of its diet and an assortment of small mammals, reptiles and amphibians make up the balance. Prey is often chased in flight through dense forests or run down in dense thickets. The Cooper's hawk is rarely found outside of patchy to dense woodland habitat. They are most frequently found near dense stands of live oak, riparian deciduous or other forest habitats near water. Nesting usually occurs near streams in second-growth conifer stands or deciduous riparian areas. Breeding takes place March through August. With an elevation range from sea level to 2,700 meters above msl, this species occurs throughout California (CDFG, 2011b).

The **ferruginous hawk** inhabits open country, breeding in trees near streams or on steep slopes, sometimes on mounds in open desert. During the breeding season, the preference

is for grasslands, sage, and other arid shrub country. Ferruginous hawks may breed in the high-elevation desert regions of northeastern California, but not in the vicinity of the property. Ferruginous hawks may only be present at the property as winter visitors. They prey on small mammals such as rabbits and ground squirrels. The density of ferruginous hawks in grasslands declines in an inverse relationship to the degree of cultivation of the grasslands. However, high densities have been reported in areas where nearly 80 percent of the grassland was under cultivation. The winter habitat is similar to that used during the summer. However, cultivated areas are not necessarily avoided, particularly when the crops are not plowed under after harvest. The standing stubble provides habitat for the small-mammal prey base. Perches such as poles, lone trees, knolls, rocky outcrops or large boulders are required.

Golden eagle is a year-round resident in most of California, wintering in the Central Valley and in the Colorado Desert. In general, they occur in rolling foothills, montane regions, sage-juniper flats, and deserts from 0 to 3,833 meters above msl. Suitable foraging habitat is open grassland, desert or savannah, and occasionally early successional stages of forest or shrub habitats. Common prey includes lagomorphs (e.g. rabbits and hares) and rodents, but they will also eat other mammals, birds, and reptiles of similar size. Roosting habitat consists of cliffs and large trees, while nesting habitat consists of cliffs and large trees in open areas. Due to its preference for nesting in cliffs, this species is generally found nesting in canyons and other similar topographic features. Breeding season starts in late January and peaks in March. Eggs are laid February to mid-May, with nesting season continuing through August.

Special Status Species

White-Tailed Kite (*Elanus leucurus*)
Family Accipitridae – Diurnal Birds of Prey
Federal Status – None
State Status – Fully Protected

White-tailed kites are yearlong residents in the Central Valley, Coast Ranges, and coastal areas in California. Foraging occurs in open grasslands, meadows, farmland, and emergent wetlands. Prey includes small mammals, small birds, voles, amphibians, reptiles, and insects. Roosting habitat consists of trees with dense canopies. In southern California, this species is known to roost in saltgrass and Bermuda grass habitats as well. Intensively cultivated areas also used. Nesting habitat is located near suitable foraging habitat. Nest trees range from single isolated trees, to trees within relatively large stands (>100 hectares). Nest tree/shrub species extremely variable, from shrubs <three meters tall (e.g., *Atriplex* and *Baccharis*) to large trees >50 m tall (e.g., *Sequoia sempervirens* and *Picea sitchensis*) (Dunk, 1995). Nesting takes place from February through October with a peak season ranging May to August (CNDDB, 2003). White-tailed kite is a yearlong resident throughout

most of California. This species forages in open grasslands, meadows, agricultural fields, and emergent wetlands. White-tailed kite nests in a variety of forested habitats and often selects oaks, cottonwood, or eucalyptus trees to build their nests in trees. This species nests from February through August and females incubate their eggs for an average of 30 days. White-tailed kites can have up to two broods per year and their young usually fledge within 40 days of hatching.

There are no documented occurrences of this species within five miles of the property (CDFG, 2003). However, the mixed evergreen forest and oak woodlands provide suitable nesting habitat for white-tailed kite and it may forage in the more open areas of the property. This species was not observed within the property during the field surveys (Keldsen, 2011).

Purple martin (*Progne subis*)
Family Hirundinidae – Swallows and martins
Federal Status – None
State Status – California Species of Special Concern

One of the world's most studied birds, the purple martin breeds in North America and winters in South America. It is widely distributed throughout the eastern United States, and patchily distributed throughout the western U.S. In California, the species is locally distributed, with the highest concentration of populations occurring along the western Cascade and Sierra Nevada Ranges; North Coast and northern Central Coast Ranges; and in extreme southwest California. The purple martin is a cavity-nester. In the north coastal area of California, purple martin is generally concentrated in coast redwood forest stands, it also utilizes coniferous forests with large dead trees, or snags, containing woodpecker holes. Ideal breeding snags are located in forested areas with relatively open canopy and access to open airspace above (Williams, 1998). Breeding season extends from April to August (Brown, 1997; Sibley, 2003).

Two occurrences have been recorded in Napa County, one south of Angwin and the second near Calistoga at the north end of Napa Valley. Neither of these occurrences is within five miles of the property (CNDDB, 2003). The property does not provide suitable nesting habitat for this species in the form of large snags with woodpecker holes, largely due to current management practices that include the removal of dead or decaying trees for firewood and/or safety. However, purple martin may occur as transients during migration. This species was not observed during the biological surveys (**Appendix D**).

Northern Spotted Owl (*Strix occidentalis caurina*)
Family Strigidae – True owls
Federal Status – Threatened
State Status – Species of Special Concern

The northern spotted owl is an uncommon permanent resident in suitable habitat. In northern California it resides in dense, old-growth and second growth, multi-layered mixed conifer, redwood and Douglas-fir habitats from sea level up to 2300 meters. Breeding range extends west of the Cascade Range through the North Coast Ranges, the Sierra Nevada and in more localized areas of the Transverse and Peninsular Ranges. It may move downslope in winter along the eastern and western slopes of the Sierra Nevada. Roost selection appears to be related closely to thermoregulatory needs; this species is intolerant of high temperatures and roosts in dense east overhead canopy on cooler slopes (north- or east-facing slopes) in summer. In winter, in Napa County, northern spotted owl roosts in similar habitats as in the summer. The northern spotted owl breeds from early March through June with peak in April and May and will usually nest in tree or snag cavities or in broken tops of large trees. Its nests are often stick nests and may include old raptor nests, red tree vole or squirrel nests.

This species primarily feeds on small mammals, including flying squirrels, woodrats, mice, voles, and rabbits. It may also eat small birds, bats, and large arthropods. The northern spotted owl usually searches from a perch and swoops or pounces on prey in vegetation or on the ground and is known to occasionally cache excess food. This species is sensitive to habitat destruction and fragmentation (CWHR, 2010).

The property is located within the range of the northern spotted owl. According to CNDDB records, there are four northern spotted owl activity centers within two miles of the property, including one that is less than 0.5 mile from the property (CDFG, 2011c). The closest known territory (NAP007) is located 1.3 miles to the north of the property (Forest Ecosystem Management, PLLC., 2011). Monitoring efforts have found NAP007 has been an active territory since first being discovered in 1989. This territory has two activity centers (ACs), with the closest activity center (AC #1) located approximately 1,472 feet from the property boundary. A portion of the property is within 0.5 mile of the second activity center (AC #2). Both activity centers were documented as active in 2011 (Forest Ecosystem Management, PLLC., 2011).

Suitable nesting and foraging habitat occurs for northern spotted owl in the Douglas Fir Forest onsite. Although northern spotted owl was not observed during the biological surveys (Kjeldsen, 2011), it has the potential to nest and forage on the Proposed Property. According to the *Northern Spotted Owl Take Avoidance* report attached to the final Biological Resources Report in **Appendix D** (Forest Ecosystem Management, PLLC., 2011), the THP for the Proposed Project abides by California Forest Practice Rule 14 CCR 919.9(e) Scenario 4: Avoidance of Disturbance and Direct Take through Habitat Retention. For a further discussion, see **Section 4.3.5-2** pertaining to impacts and mitigation measures.

4.3.4-9 SPECIAL STATUS AMPHIBIANS AND REPTILES

One special status amphibian has the potential to occur on the property either seasonally or year round (**Table 4.3-2**). This animal species is discussed briefly below.

Foothill Yellow-legged Frog (*Rana boylii*)
Family Ranidae
Federal Status – None
State Status – California Species of Special Concern
The foothill yellow-legged frog (FYLF) ranges from Oregon south through the Coast Ranges to the Transverse Mountains in Los Angeles County, California, and through the western slope of the Sierra Nevada from Oregon south to Kern County, California. The majority of healthy populations in California are in the coastal counties of northern California (Nafis, 2010; CDFG, 2011b; NatureServe 2007).

This species requires shallow, flowing water and appears to prefer small- to moderate-sized streams that have at least some cobble-sized substrate. Egg-laying occurs between late March and early June, after the high flows of winter and spring (Jennings and Hayes, 1994). FYLF are active year-round in warmer locations, and may hibernate in colder areas. FYLF is rarely found far from permanent water. It spends most of its time in or near streams year-round. Tadpoles require water for at least three or four months before developing into terrestrial frogs. During periods of inactivity, FYLF seek cover under rocks in streams or within a few meters of water. Significant migrations or other seasonal movements from breeding areas have not been reported (CDFG, 2000).

There are five CNDDB occurrences for this species within a five mile radius of the property (**Figure 4.3-5**). The nearest is located approximately four miles to the west of the property along Humbug Creek. Habitat for FYLF potentially occurs along the County-designated creek at the northern edge of the property; however, the reach of this stream not contain water on a permanent basis and is therefore not likely sufficient habitat to support FYLF. Kjeldsen (2011) did not identify FYLF onsite during the biological surveys (**Appendix D**).

4.3.4-10 SPECIAL STATUS BATS

Two bat species of special conservation status has the potential to forage and/or roost on the property: pallid bat and Townsend's big-eared bat. These species are briefly discussed below.

Pallid Bat (*Antrozous pallidus*)
Family Vespertilionidae
Federal Status – None
State Status – California Species of Special Concern
Other – Western Bat Working Group High Priority

Pallid bat occurs from British Columbia to Texas south to Baja California and central Mexico (Smithsonian, 2008). In California, pallid bat occurs throughout the state except in the high Sierra Nevada Range from Shasta County to Kern County. The pallid bat is most commonly found in dry, open habitats with rocky areas for roosting. Pallid bats roost alone or in small groups (two to 20 bats). This species has three different roosts: the day roost is usually in a warm horizontal opening such as in attics or rock cracks; the night roost is usually in the open, near foliage; and the hibernation roost, which is often in buildings, caves, or cracks in rocks (CDFG, 2011b). Roosts generally have unobstructed entrances/exits and are high above the ground. The species is an opportunistic feeder and forages primarily over open habitats. Winter habitats are not well understood but the species does not appear to migrate long distances between summer and winter sites.

There are two recorded occurrences of this species within a five mile radius of the property (**Figure 4.3-5**). The nearest record of pallid bat near the property located approximately 2.5 miles northeast of the proposed property along Highway 128 (CNDDB Occurrence Number 220). While there is no roosting habitat onsite, the open grasslands and woodlands on the property provide suitable foraging habitat for the pallid bat. This species was not observed on-site during the field surveys (Kjeldsen, 2011).

Townsend's Big-eared Bat (*Corynorhinus townsendii*)
Federal Status – None
State Status – Species of Special Concern

Townsend's big-eared bat is found throughout California in all habitats except subalpine and alpine, with the greatest abundance in mesic habitats. Within these habitats, they require caves, mines, tunnels, buildings or other man-made structures for roosting. It forages nocturnally along habitat edges gleaning over brush and trees using echolocation. Peak foraging activity occurs late in the evening preceded by flights close to the roost. Townsend's big-eared bats will hibernate from October to April. Mating typically occurs from November to February, but many females are inseminated before hibernation begins. Townsend's big-eared bats are extremely sensitive to roosting site disturbance; one visit can result in roost abandonment (CDFG, 2000).

There are no documented occurrences of this species within five miles of the property (CNDDB, 2003). However, the wet area and forest areas provide suitable foraging habitat onsite. This species was not observed on-site during the field surveys (Keldsen, 2011).

4.3.4-10 SPECIAL STATUS FISH

While none of the streams onsite have the potential to support special status fish species, they are tributary to larger creeks that may provide habitat for the Central California Coast ESU (Evolutionarily Significant Unit) of coastal steelhead, an anadromous fish listed as threatened by the NMFS. Apart from this downstream connectivity, there were no other special status fish species or habitats on the property (refer to **Table 4.3-2**). This species is discussed in greater detail below.

Central California Coastal Steelhead (*Oncorhynchus mykiss irideus)*
Central California Coast ESU
Family Salmonidae
Federal Status – Threatened
State Status – None

Steelhead are the anadromous form of rainbow trout. As such, steelhead spawn and hatch in freshwater streams in which they were born. Juveniles remain in the freshwater environment for one to two years prior to their out-migration into the ocean. Once they mature, they migrate to the marine environment. Upon sexual maturity, they migrate back to their natal streams to spawn. Unlike other types of salmonoids, steelhead are capable of spawning multiple times throughout their life and do not typically die immediately after spawning. The steelhead in the Central California Coast ESU are a winter-run species. Winter-run steelhead typically migrate from November through April and spawn shortly after they arrive to their natal spawning habitat. Although steelhead in this ESU is classified as a winter-run species, hydro-modification has fundamentally changed the life history strategies of these fish over time. As cold waters persist at predictable flow patterns from dams on an annual basis, the occurrence of this species can be outside the November to April migratory window. This species has an average lifespan of six to seven years.

The range of the steelhead in the Central California Coast ESU includes all naturally spawned populations of steelhead in coastal streams from the Russian River to Aptos Creek, and the drainages of San Francisco, San Pablo, and Suisun Bays eastward to Chipps Island at the confluence of the Sacramento and San Joaquin Rivers; and tributary streams to Suisun Marsh including Suisun Creek, Green Valley Creek, and an unnamed tributary to Cordelia Slough (often referred to as Red Top Creek), exclusive of the Sacramento-San Joaquin River Basin of the California Central Valley, and two additional artificial propagation programs. The range includes portions of Alameda, Contra Costa,

Marin, Mendocino, Napa, San Francisco, San Mateo, Santa Clara, Santa Cruz, Solano, and Sonoma counties. NMFS critical habitat has been designated for the Central California Coast steelhead ESU (NOAA, 2005). A recovery plan has not yet been completed for this species.

Though there is no suitable habitat for this species on the property, steelhead have the potential to occur in watercourses downstream of the two Class III streams that drain offsite to the northeast. Implementation of best management practices as described in the ECP (**Appendix B**) would ensure no sediment caused by implementation of the Proposed Project would enter these water courses and be transported downstream to potential fish habitat (refer to **Section 4.8 – Hydrology and Water Quality**).

4.3.5 IMPACTS ANALYSIS

4.3.5-1 SIGNIFICANCE CRITERIA

A project would have a significant adverse 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 CDFG or USFWS;
- Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations or by the CDFG or USFWS;
- Have a substantial adverse effect on federal protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal estuaries) 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 wildlife 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.

4.3.5-2 IMPACTS AND MITIGATION MEASURES

Impact 4.3-1: Development of the Proposed Project would convert some onsite Oak Woodlands to vineyard. Although agricultural projects are generally exempt from the California Oak Woodlands Conservation Act (2001), the proposed development would

conflict with Napa County Code Section 18.108.100, and the General Plan Goals CON-2 and CON-6 and Policies CON-17 and CON-24. This would be a significant impact.

According to the Timber Harvest Plan (THP) (Environmental Resource Management, 2011), the proposed development would remove approximately 3.35 acres of Black Oak Woodland. Black oak is the dominant species in this habitat type onsite. A total of 3.35 acres out of the 6.70 acres of Black Oak Woodland found on the property (50 percent) would be protected. The California Oak Woodlands Conservation Act requires Napa County to determine whether or not a proposed project would result in significant impacts to oak woodlands. If it is determined that this project would result in a significant impact that cannot be avoided, a series of actions may be prescribed by the County. These would include but are not limited to: the use of conservation easements, replacement planting, contribution to the Oak Woodlands Conservation Fund, or a combination of these and other actions. However, the conversion of oak woodlands on agricultural land used to produce or process plant and animal products for commercial purposes is exempt from this regulation.

Napa County Code Section 18.108.100 requires a permit for tree removal, and the installation of fencing or other protection measures for construction near retained trees within an erosion hazard area. Failure to protect retained trees from construction damage (e.g., soil compaction from heavy equipment, damage to bark and branches) can result in premature tree disease and mortality. In addition, wherever the removal of vegetation is necessitated and authorized, the director or designee may require the planting of replacement vegetation of an equivalent kind, quality, and quantity.

Related Napa County General Plan Goals include: CON-2 and CON-6, and Policies CON-17 and CON-24. Goal CON-2 requires maintenance and enhancement of existing levels of biodiversity. Goal CON-6 requires the preservation, sustainment and restoration of forests, woodlands, and commercial timberland for their economic, environmental, recreation, and open space values. Policy CON-17 requires the protection of sensitive biotic communities and habitats of limited distribution, including by requiring no net loss of sensitive biotic communities and habitats of limited distribution through avoidance, restoration, or replacement where feasible. Where avoidance, restoration, or replacement is not feasible, preservation of like habitat at a 2:1 ratio or greater within Napa County is required to avoid significant cumulative loss of valuable habitats (**Section 4.3.2-3**).

While the conversion of approximately 3.35 acres of oak woodland to vineyard does not represent a significant loss of native woodland habitat when considered at a regional scale (this number represents less than 0.13 percent of the total oak woodland within the County), this reduction could result in greater habitat fragmentation and reduced biodiversity in the vicinity of the property. When significant acreages of oak woodland are converted to other

uses, Napa County recommends full or partial avoidance of the target resources first. When avoidance (in whole or in part) is not feasible or is not adequate to reduce impacts to a level of insignificance, Napa County requires preservation of comparable resources through the use of conservation easements or deed restrictions. When no or insufficient comparable resources can be identified for preservation nearby, Napa County recommends enhancement (through replanting and/or management) of similar but degraded resources nearby.

Mitigation Measure 4.3-1: Impacts to oak woodland would be reduced to a less than significant level and would result in the greatest quality of oak woodland mitigation through a combination of onsite avoidance, protection, and enhancement. Mitigation to offset the removal of approximately 3.35 acres of oak woodland under the Proposed Project would be accomplished through a combination of 1) avoidance of oak woodlands remaining within the property; 2) protection of oak woodlands having the highest habitat values; and 3) enhancement of existing oak woodlands onsite. These measures are discussed further below.

Avoidance

The Proposed Project avoids approximately 3.35 acres of oak woodland, or roughly 50 percent of the oak woodland on the property. This avoidance would protect high value oak woodlands that occur onsite near drainages and springs which provide optimal perching and roosting habitat for raptors as well as habitat for many wildlife species. Additionally, for example, they provide moist conditions in the dry season by intercepting fog, which produces moist microclimates for plants and animals that require summer moisture.

All protected oak trees shall be marked on the property with visible plastic fencing during construction (consistent with the construction fencing requirements in the ECP) and shall be avoided. Visible fencing shall be placed at the edge of the dripline (edge of the tree canopy) to protect above- and below-ground tissues of these trees, which shall be field verified by a registered professional forester. The following shall not occur within the dripline of any retained oak tree: parking or storage of vehicles, machinery or other equipment; stockpiling of excavated soils, rocks or construction materials; or dumping of oils or other chemicals. A registered professional forester shall perform any pruning deemed necessary onsite.

Protection and Enhancement

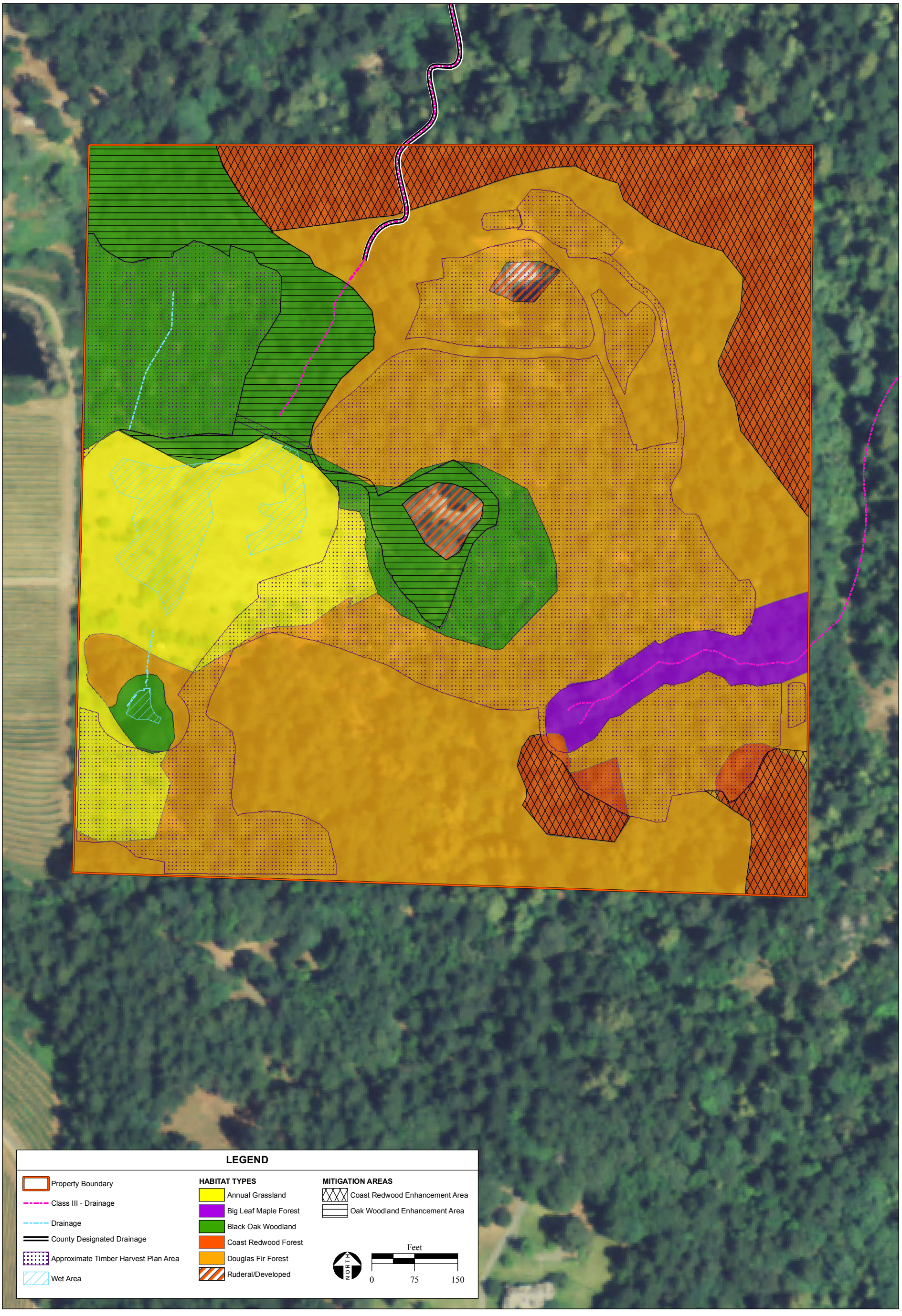
Direct impacts to oak woodlands should be mitigated by protecting and enhancing the remaining onsite oak woodlands. Oak Woodland Enhancement Areas (**Figure 4.3-6**) shall be designated for protection and enhancement activities under the direction of a registered professional forester knowledgeable about the ecology of oak woodlands. **Figure 4.3-6** shows the Oak Woodland Enhancement Areas, which are the target areas for protection and enhancement on the property.

A total of 3.35 acres shall be designated as Oak Woodland Enhancement Areas onsite and these areas shall be marked and protected during construction as well as protected during operation of the Proposed Project. The Oak Woodland Enhancement Areas shall be restricted from development and other uses that would degrade the quality of the habitat (including, but not limited to conversion to other land uses such as agriculture or urban development, and excessive off-road vehicle use that increases erosion) and should be otherwise restricted consistent with the goals and policies of Napa County. Methods to enhance the quality of the protected oak woodland onsite shall include selective cutting of Douglas Fir less than four inches diameter at breast height (dbh) so that all such trees are lopped and not removed from the site. Invasive broom shall be controlled by non-chemical methods such as weed whackers.

With implementation of **Mitigation Measure 4.3-1**, impacts would be less than significant.

Impact 4.3-2: Development of the Proposed Project would result in the removal of approximately 0.27 acre of Coast Redwood Forest (**Table 4.3-1**), a sensitive biotic community in Napa County (NCBDR, 2009) and may be inconsistent with Policies CON-17, CON-18, and CON-22. This is a potentially significant impact.

Coast Redwood Alliance is considered a sensitive biotic community in Napa County due to its limited distribution (less than 500 acres in the County). The NCBDR mapped approximately 324 acres of this biotic community in the County, and approximately 23 acres in the East Mountain Study Area in which the Proposed Project resides. Though this community was not mapped in the project vicinity by Thorne et al. in 2009, approximately 5.23 acres of Coast Redwood Forest was identified onsite (**Table 4.3-1**). The timber harvest plan would remove 0.27 acre of Coast Redwood Forest from the property and replace it with vineyard. If this amount were included in the Coast Redwood Forest currently described in the NCBDR, this removal would constitute approximately 1.2 percent of the Coast Redwood currently mapped in the Eastern Mountain Study area, and 0.08 percent of the Coast Redwood Forest currently mapped in the County.



SOURCE: Napa Valley Vineyard Engineering, 9/2010; Kjeldsen Biological Consulting, 2010; NAIP Aerial Photograph, 6/7/2009; AES, 2012

Figure 4.3-6
Biological Mitigation Areas

The Coast Redwood Forest identified onsite is not considered high quality due to past timber harvest practices. Impacts resulting from the removal of 0.27 acre of this habitat type would be reduced through avoidance of existing Coast Redwood Forest onsite located in the northeastern and southeastern margins of the property (**Figure 4.3-6**).

Mitigation Measure 4.3-2: Impacts to approximately 0.27 acre of Coast Redwood Forest would be reduced to less than significant levels by the avoidance and protection of approximately 4.96 acres (95 percent) of the total acreage of this habitat type onsite. These Coast Redwood Enhancement Areas shall be marked and protected during construction as well as protected during operation of the Proposed Project. **Figure 4.3-6** shows the Coast Redwood Enhancement Areas on the property. These areas shall be restricted from development and other uses that would degrade the quality of the habitat (including, but not limited to conversion to other land uses such as agriculture or urban development, and excessive off-road vehicle use that increases erosion) and should be otherwise restricted consistent with the goals and policies of Napa County. Any invasive broom identified within the Coast Redwood Enhancement Areas shall be controlled by the Applicant by non-chemical methods such as weed whackers.

With implementation of **Mitigation Measure 4.3-2**, impacts would be less than significant.

Impact 4.3-3: Development of the Proposed Project could result in impacts to wetlands or waters of the U.S. and may be inconsistent with Policies CON-26, CON-30 and CON-42. This is a potentially significant impact.

The two Class III drainages on the property drain to Kortum Canyon Creek, which is tributary to the Napa River. Other aquatic features onsite include the spring and an adjacent wet area that is slated to be avoided by all project development by a minimum buffer of 50 feet (**Section 3.0**).

The potential for loose soils, agricultural chemicals, and nutrients to be transported to wetlands and jurisdictional waters is a potentially significant indirect impact. Many of the proposed vineyard blocks are adjacent to streams on the property. Under the Proposed Project and consistent with the ECP, the vineyard development near the northwestern Class III stream has been protected on the property with stream setbacks that range in width from at least 35 feet on the east side and at least 85 feet on the west side (measured from top of bank) in compliance with the Napa County Conservation Regulations and Code 18.108.30. The southeastern Class III stream shall be avoided with minimum setbacks of 35 feet on either side (measured from top of bank). The minimum 35 foot setback is in compliance with Cal Fire's Forest Practice Rules, which recommend minimum 30 foot setbacks; whereas the 35 foot setbacks designated under the Proposed Project and ECP are per the recommendations of the registered professional forester (Environmental Resources

Management). The one Class IV drainage onsite in the northwestern corner, as defined by Cal Fire designations, does not meet Napa County's definition of a stream; therefore, setbacks are not defined for this drainage. This Class IV drainage is manmade as a result of improper drainage from offsite slopes, and thus, this improper drainage is corrected via the control measures in the ECP. Potential impacts related to groundwater extraction are discussed in **Section 4.8 Hydrology and Water Quality**.

With the incorporation of the mitigation measures listed below and standard BMPs (as discussed in **Section 4.8 Hydrology and Water Quality**), direct impacts to wetlands and waters of the U.S. would be less than significant.

Mitigation Measure 4.3-3: Project site design plans have been modified to avoid direct impacts to wetlands and jurisdictional waters of the U.S. In addition, the following measures will ensure further avoidance of impacts to wetlands and streams:

1. To avoid indirect impacts to waters of the U.S. and wetlands, avoidance buffers of 50 feet shall be established around the spring and adjacent wet area, consistent with the ECP. Temporary orange construction fencing shall be installed around these features and along the designated setbacks for the two onsite Class III streams per the ECP. All fencing shall be installed prior to the commencement of any earthmoving activities and shall be field verified by a qualified biologist or registered professional forester. The fencing shall remain in place until all construction activities in the vicinity have been completed.

2. Construction activities shall be conducted during the dry season to minimize impacts related to erosion, water quality, and aquatic resources and activities shall be conducted consistent with **Mitigation Measure 4.3-4** (below) to protect wildlife corridors. All disturbed areas shall be seeded and mulched to prevent erosion and sediment deposit into onsite water features and/or any off-site wetlands and waters of the U.S.

3. Staging areas shall be located away from the areas of wetland habitat onsite that are fenced off. Temporary stockpiling of excavated or imported material shall occur only in approved construction staging areas within the gross acres allocated for vineyard development (i.e., approved vineyard blocks and associated acreage). Excess excavated soil shall be used on site or disposed of at a regional landfill or other appropriate facility. Stockpiles that are to remain on the site through the wet season shall be protected to prevent erosion (e.g. with tarps, silt fences, or straw bales).

4. Standard precautions shall be employed by the construction contractor to prevent the accidental release of fuel, oil, lubricant, or other hazardous materials associated with construction activities into jurisdictional features (as detailed in **Section 4.7**).

Implementation of **Mitigation Measure 4.3-3** would reduce the impacts to a less than significant level and the development and maintenance of the Proposed Project would be consistent with Policies CON-26, CON-30 and CON-42.

Impact 4.3-4: Development of the Proposed Project could interfere with existing wildlife movement area corridors and conflict with General Plan Policy CON-18 which relates to wildlife movement. This is a potentially significant impact. After mitigation, this impact would be less than significant.

As proposed, deer fencing would surround the vineyard blocks, developed spring and adjacent wetland area, as well as the streams onsite (refer to **Figure 3-5**). As stated in the Biological Resources Report (**Appendix D**), there are no identifiable wildlife corridors through the property. Small game trails and deer trails were observed on the property and property; however, no significant wildlife corridors will be impacted by the Proposed Project (**Appendix D**). Further, the project will not impact any migratory fish in off-site watercourses provided that standard erosion control measures are implemented. Deer fencing will restrict large and medium size mammals from entering the vineyard.

There would be impacts to animal movement as a consequence of the installation of the wildlife exclusion fencing. However, gates would be installed to allow for trapped wildlife to exit the property. The Napa County designated stream (northwestern Class III) has been preserved on the property with stream setbacks that range in width from at least 35 to 85 feet (measured from top of bank). The eastern Class III drainage (not classified under Napa County stream definitions) has a 35 foot minimum corridor width, as shown in the ECP (Napa Valley Vineyard Engineering, Inc., 2011), consistent with the recommendations of the Registered Professional Forester (Environmental Resources Management). In addition, the protection of the wet area and minimum 50 foot buffer, as proposed, provide for a substantial amount of movement area. Overall, the proposed fencing would not impede small wildlife movement along stream corridors (only large wildlife from entering proposed vineyard areas); the stream corridors are a valuable habitat feature for many species.

Mitigation Measure 4.3-4: Prior to approval of the ECP and THP, the plan shall be modified to include the following:

1. The ECP shall specify fencing with openings of no less than six inches for unrestricted movement of small animals. This would reduce potential restrictions on small animals while excluding deer, wild pigs and cattle from the vineyards.

2. The onsite stream corridors, spring, and wet area shall be protected from development and other uses that would degrade the quality of the habitat for wildlife movement (including, but not limited to conversion to other land uses such as agriculture or urban development, and excessive off-road vehicle use that increases erosion) consistent with the goals and policies of Napa County for sensitive habitats.

Implementation of **Mitigation Measure 4.3-4**, combined with the remaining acres on the property proposed for protection (discussed in **Mitigation Measures 4.3-1**, **4.3-2**, and **4.3-3**) would reduce potential impacts on wildlife corridors to less than significant.

Impact 4.3-5: Development of the Proposed Project would have the potential to affect special status bird species. This is a potentially significant impact. After mitigation, impacts would be less than significant.

Development of the Proposed Project would result in direct impacts to woodland habitats in the conversion of approximately 14± acres or 40± percent of the total property to vineyard. Removal of woody and herbaceous vegetation within portions of the property would be required to implement the THP under the Proposed Project. This vegetation represents potential nesting and foraging habitat for migratory birds and special-status birds.

Bird species requiring forest interior habitat for breeding and migratory species wintering in the tropics tend to inhabit larger woodland blocks; short-distance migrants and species breeding in forest edge habitat would be more likely found in smaller woodland blocks.

Several species are federal “birds of conservation concern,” which is a designation of conservation priority, but this designation is not a ruling as to whether the species shall be listed as federal threatened/endangered and therefore protected from incidental take by the FESA. However, under the Migratory Bird Treaty Act of 1918 (16 USC Subsection 703-712), migratory bird species and their nests and eggs are protected from injury or death (**Section 4.3.2**). Therefore, project-related disturbances must be reduced or eliminated during the nesting cycle. In addition, CFG Code Subsections 3503, 3503.5, and 3800 prohibit the possession, incidental take, or needless destruction of birds, their nests, and eggs.

Should project construction occur during nesting season for most bird species (early April through mid-September), construction-related disturbances in these habitats during the nesting season could result in significant adverse impacts to bird species, including disruption of breeding, increased stress and mortality.

Bird species identified during all field visits to the property have been inventoried in Kjeldsen (2011; **Appendix D**).

Mitigation Measure 4.3-5: The Applicant shall implement the following measures to avoid disturbing any special status bird species nesting on the property. Vegetation removal conducted during the nesting period shall require a pre-construction survey for active bird nests, conducted by a qualified biologist. No known active nests shall be disturbed without a permit or other authorization from USFWS and/or CDFG.

1. Typical nesting season for raptors is March 1 through July 31. Any development of the site between the dates of March 1 through July 31 will require a pre-construction raptor survey. A qualified wildlife biologist shall conduct pre-construction surveys of all potential nesting habitat for birds within 500 feet of earthmoving activities. Surveys for nesting birds should be conducted within 14 days prior to tree removal and/or ground breaking activities. If active bird nests are found during pre-construction surveys, a 500 foot no-disturbance buffer shall be created around active raptor nests during the breeding season or until it is determined that all young have fledged (**Appendix D**).

With implementation of **Mitigation Measure 4.3-5**, impacts would be less than significant.

Impact 4.3-6: Changes in habitat as a result of the Proposed Project were analyzed in the *Northern Spotted Owl Take Avoidance* report prepared by Forest Ecosystem Management, PLLC in 2010 (updated in 2011) for the property (**Appendix D**). As stated above in **Section 4.3.4-10**, according to the *Northern Spotted Owl Take Avoidance* report attached to the final Biological Resources Report in **Appendix D** (Forest Ecosystem Management, PLLC., 2011), the THP for the Proposed Project abides by California Forest Practice Rule (FPR) 14 CCR 919.9(e) Scenario 4: Avoidance of Disturbance and Direct Take through Habitat Retention.

The habitat analysis performed on the property consistent with FPR 14 CCR 919.9(e) Scenario 4 concluded that there is suitable habitat for northern spotted owl within the property; territory NAP007 was detected through historic and current survey efforts within 1.3 miles of the proposed timber operations (Forest Ecosystem Management, PLLC., 2011). According to the *Northern Spotted Owl Take Avoidance* report, habitat typing was completed by Pam Town, Consulting Wildlife Biologist, using aerial photographs and old habitat maps. Theodore Wooster was consulted regarding habitat type accuracy as he is very familiar with the area as well as Scott Butler, the Registered Professional Forester for the proposed timber harvest element of the Proposed Project (Forest Ecosystem Management, PLLC., 2011). Therefore, the habitat typing was thoroughly reviewed for accuracy. Further, the home range acres for the two activity centers of NAP007 are above desired conditions within the 0.7 to 1.3-mile assessment areas for which habitat was assessed for northern spotted owl (Forest Ecosystem Management, PLLC., 2011).. A core

habitat area of nesting/roosting contiguous habitat greater than 100 acres does exist around the activity centers NAP007 #1 and #2 (Forest Ecosystem Management, PLLC., 2011).

Development of the Proposed Project would result in the removal of 11.5 acres of nesting/roosting habitat and 4 acres of foraging habitat for northern spotted owl (Forest Ecosystem Management, PLLC, 2011). The area to be converted is located on the ridge tops, which are areas less likely to be used by northern spotted owls. Post-project, there will be forested corridors between two of the vineyard blocks that may still retain the definition of nesting/roosting habitat; however, as it will be a narrow strip surrounded by vineyards, it would be classified as unsuitable habitat (Forest Ecosystem Management, PLLC, 2011).

Impacts of the Proposed Project to northern spotted owl habitat were analyzed according to the acreage of suitable habitat post-project within a 0.7 mile radius of an activity center, whereby at least 200 acres of nesting/roosting habitat is the basis for the habitat retention standard (Forest Ecosystem Management, PLLC, 2011; **Appendix D**). The results of the analysis show that the habitat retention standard would be met post-timber harvest for both activity centers #1 and #2 of territory NAP007, for which NAP007 is the closest and only active territory within 0.7 mile of the project footprint. Also, the removal of habitat will not drop the necessary habitat retention standards below the minimal requirements (Forest Ecosystem Management, PLLC, 2011). Thus, the THP abides by California Forest Practice Rule 14 CCR 919.9(e) Scenario 4: Avoidance of Disturbance and Direct Take through Habitat Retention (Forest Ecosystem Management, PLLC, 2011).

Combined, the acreage of northern spotted owl habitat that would be removed by the Proposed Project equals 14± acres or 2.8 percent of suitable habitat within a 0.7 mile radius or 1.04 percent of suitable habitat within a 1.3 mile radius of the property. Due to the small size of the project and the fact that the habitat retention standards would be met for post-project conditions for both activity centers NAP007 #1 and NAP007 #2, which are the closest activity centers to the Proposed Project and are the only activity centers within 0.7 miles of the project footprint, with implementation of **Mitigation Measure 4.3-6** (below) impacts to northern spotted owl habitat would be less than significant.

Mitigation 4.3-6: The Applicant shall implement the following measures to avoid take of the northern spotted owl (based on Forest Ecosystem Management, PLLC, 2011; **Appendix D**):

1. No timber operations shall occur until such time as a current years' NSO survey (following the appropriate and most current NSO survey protocol) has been completed, the results have been provided to the appropriate agency, and the results of a take avoidance determination has been incorporated into the plan.

2. No harvesting of trees shall occur until NAP007 is detected/located within their

historic activity center during the year of planned timber harvest activities. The owl's activity center is located on private property; therefore, daytime monitoring of the owl may not be possible due to access issues. If the owl is not detected within their historic activity centers, the property must be surveyed according to the current acceptable NSO protocol.

3. No timber harvest operations other than the use of existing roads will occur within 1,000 feet of the activity centers of NAP007. The activity centers for NAP007 are further than 1/4 mile from the THP boundary (1,472 feet - AC #1); therefore, at this time, no seasonal or harvest restrictions apply. However, if the activity center moves within 1/4 mile of the property boundary, the following seasonal restrictions may be applied by Cal Fire.

    a. Seasonal Restrictions: No operations from February 1 to July 30 within 1/4 mile of the activity centers of NAP007, except on the use of existing roads (refer to Forest Ecosystem Management, PLLC, 2011; **Appendix D**).

Implementation of **Mitigation Measure 4.3-6** would render impacts to a less than significant level.

Impact 4.3-7: Development of the Proposed Project could have the potential to affect Central Coast ESU Steelhead Salmon and its associated critical habitat, as well as other off-site special status aquatic species. However, with the avoidance and mitigation measures as well as the erosion control measures in the ECP incorporated into the Proposed Project, impacts would be less than significant.

Critical Habitat for Steelhead is present in Kortum Canyon Creek, which is directly tributary to the Napa River. The two Class III drainages on the property do not provide suitable habitat for special status fish, but they do drain to Kortum Canyon Creek. The Proposed Project would not modify the physical conditions of the streams on the property. The Proposed Project includes the maintenance of stream setbacks, the restriction of earthmoving activities to the dry season (April 1 through September 1) consistent with County Code Section 18.108.070(L), and the installation of straw wattles, seeding and mulching of disturbed areas, and other erosion control measures and BMPs discussed in **Section 3.0** and in the ECP (**Appendix B**). The Proposed Project would not increase runoff rates or volumes, or degrade water quality (discussed in **Section 4.8 Hydrology and Water Quality**) and would not increase soil erosion or sedimentation (discussed in **Section 4.5 Geology and Soils**). This impact is less than significant.

Mitigation 4.3-7: No further mitigation is required.

Impact 4.3-8: Development of the Proposed Project would have the potential to affect special status bat species. After mitigation, impacts would be less than significant.

Development of the Proposed Project could result in direct impacts to bat nesting habitat through the removal of large trees with sufficient decay to provide roosting habitat. Two special status bat species have the potential to occur on the property: the pallid bat and Townsend's big-eared bat. Maternity colonies of pallid bats could roost in large deep cavities in oaks or other large trees and could be adversely affected during tree removal. Both species potentially forage over the property and roost under bark or in the cavities of trees, rock crevices or nearby human-made structures. Many bat species are known to utilize vineyards for foraging habitat (Western Bat Working Group, 2005). The biodynamic nature of management proposed for the vineyard onsite would limit the use of insecticides on the property; as a result, the quality of foraging and insect prey found in vineyard habitat would be similar to insect prey found in undeveloped areas. Additionally, all aquatic features onsite would be preserved, providing further foraging habitat for bats.

Construction related activities within the vicinity of roosting habitat also have the potential to impact nesting bats. Project construction would occur during the breeding season for these and other bat species (generally between early April and mid-September). Potentially significant impacts could occur to bats during the breeding season.

Mitigation Measure 4.3-8: Pre-construction surveys for bats shall be conducted two to three days prior to tree removal. If bats are discovered during the surveys then a buffer of 100 to 150 feet will be established. Optimal time to remove trees is September 15 to October 15 and February 15 to April 1. Pre-construction surveys shall also focus on habitat adjacent to the Proposed Project (**Appendix D**).

With implementation of **Mitigation Measure 4.3-8**, impacts would be less than significant.

Impact 4.3-9: Development of the Proposed Project could result in conflicts with Napa County Code Section 18.108.025 (General provisions – Intermittent/perennial streams). Stream setbacks have been incorporated as part of the Proposed Project design. Impacts would therefore be less than significant.

Napa County Code Section 18.108.025 states that clearing of land for new agricultural uses must comply with designated stream setbacks (based on slope) that are measured from the top of bank on both sides of the stream as it exists at the time of replanting, redevelopment, or new agricultural activity. Stream corridors have been preserved throughout the property and setbacks range from at least 35 feet (non-Napa County designated streams) to 85 feet at the northwest Class III Napa County designated stream (**Appendix B**). Additionally, minimum 50-foot setbacks would be maintained around the onsite developed spring and

adjacent wet area. Implementation of these setbacks would reduce potential impacts to less than significant.

Mitigation 4.3-9: No mitigation is required.

REFERENCES

American Ornithologists' Union, 1998. Check-list of North American Birds, seventh ed. Washington, D. C. American Ornithologists' Union.

American Ornithologists' Union, 2010. Fifty-first supplement to the American Ornithologists' Union Check-list of North American Birds. Auk 127:726-744.

Baker, R. J., L. C. Bradley, R. D. Bradley, J. W. Dragoo, M. D. Engstrom, R. S. Hoffmann, C. A. Jones, F. Reid, D. W. Rice, C. Jones, 2003. Revised Checklist of North American Mammals North of Mexico, 2003. Occasional Papers of the Museum of Natural History, Texas Tech University OP – 229.

Baldwin, S., et al., 2003. Jepson Online Interchange. Jepson Flora Project, University and Jepson Herbaria, University of California, Berkeley. Berkeley, California. Available online at: http://ucjeps.berkeley.edu/interchange.html/

Berner, M. B. Grummer, R. Leong, and M. Rippey, 2003. Breeding Birds of Napa County: An Illustrated Atlas of Nesting Birds. Napa-Solano Audubon Society. Vallejo, California.

Brodo, I. M., S. D. Sharnoff, and S. Sharnoff, 2001. *Lichens of North America*. Yale University Press, New Haven, Connecticut.

Brown, C.R., 1997. Purple Martin (*Progne subis*). *In* The Birds of North America, No. 287 (A. Poole and F. Gill, eds.). The Academy of Natural Sciences, Philadelphia, PA, and The American Ornithologists' Union, Washington, D.C.

California Department of Fish and Game (CDFG), California Interagency Wildlife Task Group, 2000. California Wildlife Habitat Relationships System. Life History Account for Foothill Yellow-legged Frog. Updated in 2000 from Zeiner, D.C., W.F.Laudenslayer, Jr., K.E. Mayer, and M. White, eds. 1988-1990. California's Wildlife. Vol. I-III. California Depart. of Fish and Game, Sacramento, California.

CDFG, 2003. RareFind, Version 3.1, California Natural Diversity Data Base (CNDDB) Biogeographic Data Branch. Last updated March 2, 2011. Date last queried: April 30, 2011.

CDFG, 2005. California Interagency Wildlife Task Group. California Wildlife Habitat Relationships version 8.1 personal computer program. Sacramento, California.

CDFG, 2011a. California Natural Diversity Database – Special Status Invertebrate Species Accounts. (last updated April 6, 2011). Available online at: http://www.dfg.ca.gov/biogeodata/cnddb/invertebrates.asp. Last accessed April 30, 2011.

CDFG, 2011b. Life History Accounts of Special-Status Species. Available online at: http://nrm.dfg.ca.gov/taxaquery/Default.aspx. Last accessed June, 2011.

CDFG, 2011c. Memorandum from Carl Wilcox, Regional Manager, Bay Delta Region to Allen Robertson, Cal Fire. Subject: Jasud Estate Vineyards Timberland Conversion Project, SCH#2011042037, City of Calistoga, Napa County. April 28, 2011.

CDFG, 2012. California Department of Fish and Game, Nongame Wildlife Program, Native Plant Conservation. Available online at: http://www.dfg.ca.gov/wildlife/nongame/t_e_spp/nat_plnt_consv.html. Accessed on March 30, 2012.

California Department of Forestry and Fire Protection (Cal Fire), 2011. *California Forest Practice Rules, Title 14, California Code of Regulations Chapters 4, 4.5 and 10*. Available online at: http://www.fire.ca.gov/resource_mgt/downloads/2011_FP_Rulebook_with_Diagrams_with_Tech_Rule_No_1.pdf Accessed on March 20, 2012.

California Native Plant Society (CNPS), 2011. Inventory of Rare and Endangered Plants (online edition v7-10d). Rare Plant Scientific Advisory Committee, David P. Tibor, convening editor. California Native Plant Society. Sacramento, California. Available online at: http://www.cnps.org/inventory. Date last queried: April 30, 2011.

California Wildlife Habitat Relationships System (CHWR), 2010. California Wildlife Habitat Relationships System (CWHR). Life History Accounts and Range Maps for species in California. Updated or provided from Zeiner, D.C., W.F.Laudenslayer, Jr., K.E. Mayer, and M. White, eds. 1988-1990. California's Wildlife. Vol. I-III. California Depart. of Fish and Game, Sacramento, California. Available online at: http://www.dfg.ca.gov/biogeodata/cwhr/cawildlife.aspx last accessed October 15, 2010.

Crother, B.I. (ed), 2008. Scientific and Standard English Names of Amphibians and Reptiles of North America North of Mexico, pp. 1-84. SSAR Herpetological Circular 37.

Doyle, W. T., and R. E. Stotler, 2006. Contributions toward a Bryoflora of California: III. Keys and Annotated Species Catalogue for Liverworts and Hornworts. Madrono 53: 89-197.

Forest Ecosystem Management, PLLC. 2011. Northern Spotted Owl Take Avoidance. Prepared for the Jasud Estate THP. Updated on October 18, 2011.

Harrison, R.L., 1992. Toward a theory of inter-refuge corridor design. *Conservation Biology*, 6: 293-295.

Henein, K. and G. Merriam, 1990. The elements of connectivity where corridor qualify is variable. *Landscape Ecology* 4: 157-170.

Hickman, J.C., 1993a. *The Jepson Manual, Higher Plants of California*. University of California Press, Berkeley, California.

Hickman, J. C., 1993b. Jepson Online Interchange for California Floristics. University of California, Berkley, California. Available online at: http://ucjeps.berkeley.edu/interchange.html.

Hilty J. and A. Merenlender, 2002. Vineyard Landscape, Wildlife Activity Along Creek Corridors. Practical Winery and Vineyard: November/December 2002. Available online at: http://www.practicalwinery.com/novdec02/novdec02p6.htm.

Hilty, J. A. and A. M. Merenlender. 2004. Use of Riparian Corridors and Vineyards by Mammalian Predators in Northern California. *Conservation Biology* 18(1):132-137.

Holland, R.F., 1986. Preliminary descriptions of the terrestrial natural communities of California. State of California, The Resources Agency, Nongame Heritage Program, Department of Fish and Game, Sacramento, CA. 156 pp.

Jennings, M.R. and Hayes, M.P., 1994. Amphibians and Reptiles of Special Concern. California Department of Fish and Game, Inland Fisheries Division.

Kjeldsen, et al., 2011. Biological Resources Report for the Jasud Estate LLC THP/TCP. September 22, 2011.

Lambert, G. and J. Kashiwagi, 1978. Soil Survey of Napa County, California. United States Department of Agriculture Soil Conservation Service and California Agricultural Experimental Station.

Lewis, H., 2006. *Trichostema ruygtii* (Lamiaceae): A new species from Napa County, California. *Madroño* 53: 282.

Mayer, P.M., S.K. Reynolds, Jr., T.J. Canfield and M.D. McCutchen, 2005. Riparian Buffer Width, Vegetative Cover, and Nitrogen Removal Effectiveness: A Review of Current Science and Regulations. U.S. Environmental Protection Agency, National Risk Management Research Laboratory.

Nafis, G., 2010. California Herps. Information About California Frogs, Snakes, Lizards, Turtles and Salamanders. Available from www.californiaherps.com Last accessed October 15, 2010.

Napa County, 2008. Napa County General Plan. June 2, 2008. Available online at: http://www.co.napa.ca.us/GOV/Departments/DeptDocs.asp?DID=8&T=68&V=0&od=0.

Napa County Conservation, Development, and Planning Department (NCCDPD), 2005. Napa County Baseline Data Report: Version 1; Chapter 4 Biological Resources. Napa County, California.

Napa County RCD, 2005. *Central Napa River Watershed Project. Salmonid Habitat Form and Function.* Prepared by Napa County Resource Conservation District for California Department of Fish and Game. October 2005.

Napa County Watershed Information Center and Conservancy, 2005. Baseline Data Report (NCBDR). November 30, 2005, Version I. Napa Count, CA.

Napa Valley Vineyard Engineering, 2011. Erosion Control Plan for the Jasud Estate THP/TCP.

National Audubon Society, 2007. Audubon Watchlist. Available online at: http://web1.audubon.org/science/species/watchlist/browsewatchlist.php.

National Oceanic and Atmospheric Administration (NOAA), 2005. Designation of critical habitat for seven Evolutionarily Significant Units of Pacific salmon and steelhead. 70 CFR 170: 52488-52627.

NatureServe, 2007. A network connecting science with conservation. Available online at: http://www.natureserve.org/getData/index.jsp.

Nelson, J. S., E. J. Crossman, H. Espinosa-Pérez, L. T. Findley, C. R. Gilbert, R. N. lea, and J. D. Williams (eds.), 2004. A List of Common and Scientific Names of Fishes from the United States, Canada, and Mexico. 6th edition. American Fisheries Society Special Publication 20.

Norris, D.H. & J.R. Shevock. 2004a. Contributions toward a bryoflora of California: I. A specimen-based catalogue of mosses. Madroño 51: 1-131.

Norris, D.H. & J.R. Shevock, 2004b. Contributions toward a bryoflora of California: II. A key to the mosses. Madroño 51: 133-269.

Pauly, Greg B., Hillis, David M. & Cannatella, David C. (2009): Taxonomic freedom and the role of official lists of species names. *Herpetologica* 65: 115-128.

Pyron, R.A. and F.T. Burbrink, 2009. Systematics of the common kingsnake (*Lampropeltis getula; Serpentes: Colubridae*) and the burden of heritage in taxonomy. Zootaxa 2241: 22-32.

Rathbun, G. B., N. Siepel, and D. Holland, 1992. "Nesting Behavior and Movements of Western Pond Turtles, *Clemmys marmorata". The Southwestern Naturalist*, Vol. 37, No. 3. pgs 319-324. September 1992.

Rathbun, G. B., N. J. Scott, Jr., and T. G. Murphey, 2002. Terrestrial habitat use by Pacific pond turtles in a Mediterranean climate. The Southwestern Naturalist 47: 225-235.

Reese, D. and H. Welsh, 1997. Use of Terrestrial Habitat by Western Pond Turtles, *Clemmys marmorata:* Implications for Management. *Proceedings: Conservation, Restoration and Management of Tortoises and Turtles, An International Conference* held by the New York Turtle and Tortoise Society, Vol. 47, No. 2. pgs 352-357. June 2002.

Reid, F.A., 2006. *Mammals of North America*. Fourth Edition. Houghton Mifflin Company. Boston, Massachusetts.

Rogers, M.M., S.A. Glover, E. Pandolfino, and S.B. Terill, 2008. The regional reports: Northern California. *North American Birds* 61: 636-639.

Sawyer, J.O., T. Keeler-Wolf, and J. Evans, 2009. *A manual of California vegetation*. Second Edition. California Native Plant Society, Sacramento, California.

Shaffer, H.B., G.M. Fellers, S.R. Voss, J.C. Oliver, and G.B. Pauly, 2004. Species boundaries, phylogeography and conservation genetics of the red-legged frog (*Rana aurora / draytonii*) complex. *Molecular Ecology* (2004) 13:2667-2677.

Shuford, W.D., and T. Gardali, eds., 2008. California bird species of special concern: a ranked assessment of species, subspecies, and distinct populations of birds of

immediate conservation concern in California. Studies of Western Birds 1. Western Field Ornithologists, Camarillo, California, and California Department of Fish and Game, Sacramento, California.

Sibley, D.A., 2003. *The Sibley Field Guide to Birds of Western North America*. Alfred A. Knopf, Inc., New York, New York.

Slone, D., 2006. *Geology of the San Francisco Bay Region*. University of California Press. Berkeley, California.

Smithsonian, 2008. National Museum of Natural History. North American Mammals: *Antrozous pallidus*, Pallid Bat. Available online at: http://www.mnh.si.edu/mna/image_info.cfm?species_id=8. Accessed in July 2011.

Stebbins, R.C., 2003. *Western Reptile and Amphibians*, 3rd ed. Houghton Mifflin, Boston, Massachusetts.

Tewksbury, J.J., Levey, D.J., Haddad, N.M., Sargent, S., Orrock, J.L., Weldon, A., Danielson, B.J., Brinkerhoff, J., Damschen, E.I., and Townsend, P., 2002. Corridors affect plants, animals, and their interactions in fragmented landscapes. PNAS, October 1, 2002; 99(20): 12,923 – 12,926. Available online at: http://www.pnas.org/cgi/reprint/99/20/12923.pdf.

Thorne, J.H., J.A Kennedy, J.F. Quinn, M. Mccoy, T. Keeler-Wolf, and J. Menke. 2004. A Vegetation Map of Napa County Using The Manual of California Vegetation Classification and its Comparison to Other Digital Vegetation Maps. *Madroño* 51:4, 343-363.

Thorne, J.H., J.A Kennedy, J.F. Quinn, M. McCoy, T. Keeler-Wolf, and J. Menke, 2004. A Vegetation Map of Napa County Using the Manual of California Vegetation Classification and its Comparison to Other Digital Vegetation Maps. *Madroño* 51: 343-363.

Tigas, L.A., D.H. Van Vurena, and R.M. Sauvagot, 2000. Behavioral responses of bobcats and coyotes to habitat fragmentation and corridors in an urban environment. *Biological Conservation* 108: 299-306.

U.S. Federal Register, 1991. Volume 56, No. 231, 61173. Determination of Endangered Status for Three Plants, Blennosperma bakeri (Sonoma sunshine or Baker's stickyseed), Lasthenia burkei (Burke's goldfields) and Limnanthes vinculans (Sebastopol meadowfoam). December 2, 1991.

U.S. Federal Register, 1997. Volume 62, No. 204, 55791. Determination of Endangered Status for Nine Plants from the Grasslands or Mesic Areas of the Central Coast of California. October 22, 1997.

U.S. Federal Register, 2005. Volume 70, No. 154, 46923-46999. Final Designation of Critical Habitat of Four Vernal Pool Crustaceans and Eleven Vernal Pool Plants in California and Southern Oregon, final rule. August 11, 2005.

U.S. Fish and Wildlife Service (USFWS), 1986. Pacific bald eagle recovery plan. U.S. Fish and Wildlife Service, Portland, Oregon.

USFWS, 2011a. National Wetlands Inventory. Available online at: http://www.fws.gov/nwi.

USFWS, 2011b. Species Information, Threatened and Endangered Plants and Animals. Available online at: http://endangered.fws.gov/wildlife.html. Database last updated April 29, 2010. Last accessed November 18, 2010.

Western Bat Working Group, 2005. Species Accounts for Pallid Bat and Townsend's Big-Eared Bat. Updated 2005. Available online at: http://www.wbwg.org/speciesinfo/species_accounts/species_accounts.html.

Western Bat Working Group, 2007. Regional Bat Species Priority Matrix. Available online at: http://wbwg.org/species_matrix/spp_matrix.pdf.

Williams, B. D. C., 1998. Distribution, habitat associations, and conservation of Purple Martins in California. M.S. thesis, Calif. State Univ., Sacramento.

World Climate, 2008. Historical weather information for Napa State Hospital, Napa County, California. Average rainfall data 1917-1995. Available online at: http://www.worldclimate.com/cgi-bin/data.pl?ref=N38W122+2200+046074C. Last accessed April 30, 2011.

4.4 CULTURAL RESOURCES

4.4.1 SETTING

4.4.1-1 REGIONAL SETTING

The property is part of the hilly to steep mountains located in the southern North Coast Ranges in northwestern Napa County. A number of northwesterly parallel mountain ridges and intervening valleys of varying widths characterize the area. Characteristic vegetation communities occurring within the project region include annual grassland, oak savannah, oak woodland, pine-oak woodland, mixed oak, bay, riparian, madrone woodland and chaparral. Aquatic habitats on the property include seasonal and perennial drainages, seasonal wetlands and springs.

Formal archaeological research in the project vicinity dates back at least to Nelson's (1909) study of Bay Area shell mounds. Early syntheses of Napa County area prehistory include Heizer (1953), Meighan (1955), and Elsasser (1978). Elsasser's study is more recent but draws largely on the same sources as the previous works. Other recent cultural resources studies in the southern North Coast Ranges have built on the work of Fredrickson (1974), who divides human history in California into three broad periods: Paleo-Indian, Archaic, and Emergent. This scheme differentiates between cultural units based on sociopolitical complexity, trade networks, population, and artifact variation. Additionally, Moratto (1984) provides an overview of the culture history of the San Francisco Bay Area. Milliken et al. (2007) devise a chronological framework for the San Francisco Bay Area based on material culture, particularly shell beads and ground stone. This chronology is an update of efforts by Fredrickson (1973, 1974) and Bennyhoff (1994) but incorporates new data, including Groza's (2002) work detailing the radiocarbon dating of shell beads throughout the Bay Area. This summary attempts to combine the basic terms that are used by these various schemes for differentiating the major time intervals (e.g. Early Holocene (Lower Archaic)).

Early Holocene (Lower Archaic) 10,000-5,500 B.P.

Evidence available from relatively few sites suggests regional occupation by semi-mobile foraging groups and subsistence based upon plants supplemented with marine resources (particularly shellfish) with less dietary emphasis on fish and birds. However, preservation bias may be suspected as a factor in this interpretation. The archaeological record is characterized by ground stone artifacts, particularly milling stones and hand stones (e.g. manos). Projectile technology includes large, wide-stemmed and leaf-shaped points. Tightly flexed burials are also a characteristic of this time period. The earliest date for characteristic assemblages is 9,920 years before present (B.P.), which was obtained from charcoal beneath a milling slab at CA-CCO-696 in the East Bay. This archaeological pattern was also evident at sites in the South Bay (e.g. CA-SCL-178 and CA-SCL-65) and in the North Bay (e.g. CA-SON-348/H and CA-SON-20) (Milliken et al., 2007: 114).

Early Period (Middle Archaic) 5,500-2,500 B.P.

The Early Period witnesses a series of technological and social innovations in some areas that suggest a more sedentary lifestyle. Regional variation in material culture also becomes apparent, particularly within the San Francisco Bay Area. Rectangular *Olivella* (purple olive) and *Haliotis* (abalone) shell beads, perforated by cutting and drilling, are chronological indicators. Additions to the ground stone technology include the mortar-and-pestle toolkit, which appear at roughly 6,000 B.P. and may signal reduced mobility for some local groups. Increased abundance of net-sinkers also suggests increased concentration on harvesting marine resources, particularly fish. Shell mounds in the central Bay Area with recovered mortars and pestles include the Ellis Landing (CA-CCO-295) and West Berkeley (CA-ALA-307) sites. These locations may be part of a socioeconomic pattern shifting emphasis from mobility to increased semi-sedentary settlements. Evidence of sedentism further inland includes recovery of a house floor with post holes dated to ca. 3,500 B.P. The record at North Bay indicates continuation of a more mobile life style throughout much of the Early Period until approximately 3,500 B.P. in Napa Valley and about 3,000 B.P. in Sonoma (Milliken et al., 2007: 114-115).

Lower Middle Period (Initial Upper Archaic) 2,500 to 1,570 B.P.

The Lower Middle Period is often made archaeologically manifest by stylistic changes in shell beads. Rectangular forms that were once very common now disappear, perhaps as a result of ceremonial or religious influences. These are replaced with split-beveled and tiny saucer *Olivella* beads, which are then outnumbered by large saucer beads. This transition in material culture includes established trading patterns, and as a recognized archaeological manifestation these items belong to Bead Horizon M1. *Haliotis* ornaments also appear during this period, along with a new array of bone and antler tools. Awls, presumably for making basketry, signal the early development of the long-standing coiling technology in the Central and North Bay. The frequency of mortar and pestle recovery at sites increases, perhaps marking increased sedentary and is interpreted as a marker of increasing sedentary lifestyle. Meanwhile, the milling stone/hand stone forager economy persists only on the Pacific Coast of the San Francisco Peninsula (Milliken et al., 2007: 115-116).

Upper Middle Period (Late Upper Archaic) 1,570 to 950 B.P.

The transition to the Upper Middle Period (Late Upper Archaic Period) is marked by another dramatic shift in material cultural. The trade network of saucer beads disappeared and was replaced by a series of temporally diagnostic beads known as M2, M3, and M4. At the end of the M1 bead horizon, extended burials placed on the dorsal side characterize the Meganos complex. Meganos burials have abundant grave goods, specifically the typical M1 saucer beads. M2 saddle beads are distinct due to their very small perforations. Material culture related to the M2 horizon (1,580 to 1,400 B.P.) contains new artifact types such as ceremonial (non-utilitarian) blades, fishtail charmstones, mica ornaments and a new type of

Haliotis ornaments. The M3 horizon (1,400 to 1,200 B.P.) represents the height of stylistic expertise through the small, delicate square saddle beads. The Meganos Complex continues to be expressed during the M3 horizon, but is restricted to the East Bay. The M4 horizon (1,200 to 950 B.P.) is a collapse of the saddle bead form and the introduction of a variety of new bisymmetrical bead shapes. Also, new forms of *Haliotis* ornaments are common during the M4 horizon (Milliken et al., 2007: 116-117).

Initial Late Period (Lower Emergent) 950 to 450 B.P.

The cultures of the Bay Area underwent significant changes in the Initial Late Period. Of particular interest are the implications of the introduction of bow and arrow technology. Primarily, a host of new projectile point types appeared in the archaeological record. The earliest arrow-sized projectile point is the Stockton Serrated series, which appeared at approximately 750 B.P. (Justice, 2002:352). Procurement of high-quality sources of obsidian, such as Napa Valley Glass Mountain, was reduced dramatically, which is thought to be the result of the control of the sources by a few elite groups. In addition to innovation in flaked stone technology, advances in groundstone resulted in non-utilitarian mortars likely used for ceremonial purposes. New forms of beads and ornaments also appeared, particularly the *Olivella* callus cup and sequin beads (horizon L1) and the *Haliotis* banjo effigy ornament. Increases in social stratification were apparent through grave goods of significantly greater wealth than was seen in previous periods (Milliken et al., 2007: 116-117).

Terminal Late Period: 450 B.P. to Spanish Contact (1776)

Clamshell disk beads (Bead Horizon L) replace cup and sequin beads during this period. However, for the first century clamshell disk beads were restricted to the North Bay. The rest of the region manufactured *Olivella* lipped and spire-lopped beads prior to the introduction of the new clamshell disk bead. The North Bay was the host of many innovations during this period. New artifact types seen in the North Bay during this period include hopper mortars, magnesite tube beads, corner-notched projectile points and toggle harpoons. The Terminal Late Period ends with Spanish Contact in 1776 (Milliken et al., 2007: 117-118).

Ethnography

Ethnographic literature indicates that at the time of historic contact, the project area was within the eastern portion of the territory occupied by Wappo-speaking people. There were five dialects of Wappo, which is a member of the Yukian language family (also including Yuki, Coast Yuki, and Huchnom). Four of these dialects were centered in the Napa/Alexander Valley area and the fifth was an isolated enclave on the south bank of Clear Lake (Sawyer 1978:257). The territory of the Southern Wappo extended roughly from just north of the City of Napa northward to the City of St. Helena, encompassing the lower half of

the Napa Valley and the fringing foothills and low mountains to the east and west including Pope Valley. The Wappo economy was based on fishing, hunting, and gathering, with village community, or tribelet, members moving to various places within their territory on a seasonal basis to take full advantage of different resources as they became available.

The Wappo people organized themselves into small groups that anthropologists call tribelets or village communities. The social and political organization of these individual groups showed considerable variation (Sawyer 1978:259). A typical Wappo tribelet inhabited a semi-permanent village from which they made trips to temporary seasonal camps. Some Wappo tribelets defended their territory against trespassers, but land was not considered privately owned (Sawyer 1978:260). The environs of Napa, Pope, and Chiles Valleys and the foothills east of the study area were intensively used by the Wappo and several ethnographic villages and campsites are located in the general vicinity of the study area (Barrett 1908; Sawyer 1978). The closest documented ethnographic village to the study area was ka'imus, an old village site described as being located at Yountville (Barrett 1908:268; Sawyer 1978:257).

The Wappo, strongly influenced by their Pomo neighbors, were also known for their expertise in basket making (Sawyer 1978:261) and accounts have noted their similarity to their Pomo neighbors (Kroeber 1925). Money existed in the form of clamshell disk beads which were worn as decoration. The types of houses used by the Wappo varied depending on the climate and vegetation of each district. During the winter, in the region encompassing the study area, the Wappo erected a framework of poles, bent together at the top and thatched with bundles of grass. These were attached to horizontal poles on the frame and each course clamped down by another horizontal stick. The shape of the structure was sometimes circular, perhaps more often rectangular, or like the letter L (Sawyer 1978). During the summer, simpler temporary brush shelters were used instead. In addition, the Wappo built sweat and dance houses. Both shared identical building plans, varying only in size, use, and name.

Typical weapons used in hunting were the bow and arrow for larger game and club for bear. Smaller animals were captured by bola, low brush fences, nets, snares and basketry traps. Lake, stream and ocean fish were caught in traps, with lines or weirs. The traditional mortar and pestle were used for processing of acorn, Buckeye nuts and other seeds, grasses and roots (Powers 1877). The stone mortars were natural shapes and were used with bottomless basketry hopper. Knives were made from obsidian or chert and could be attached to handles and used as axes. Bone was not used often and was most notably used for awls and fishhooks.

The Wappo culture was significantly disrupted through missionization and Euroamerican settlement during the 19th century, which they heartily resisted. "Wappo" is the

Americanization of "Guapo," the Spanish word for brave. This was the Spanish name applied to the tribe during the time of missionizaton due to the people's resistance to the Franciscan establishment (Kroeber 1925).

4.4.1-2 HISTORICAL SETTING

Following the settlement of San Diego and Monterey, the Spanish made steady progress in the exploration and settlement of the coastal regions of Alta California. The interior regions, such as the Central Valley and the Sierra Nevada, remained largely uncharted. Spaniards made occasional forays into the Central Valley in pursuit of natives who had fled the forced labor imposed on them at coastal missions. Between 1804 and 1823 the Spanish made numerous trips into the Valley prospecting for new mission sites, attempting to recover stolen horses and cattle, or making punitive raids on the local natives believed responsible for the theft of livestock. Chief among the Spanish explorers was Pedro Fages, who led at least 46 explorations into the interior between 1805 and 1820. During his many expeditions he named the San Joaquin, Mariposa, Merced and Sacramento Rivers (Caughey, 1940). The first recorded expedition into what is now Napa County was made in 1823 led by Francisco Castro with Jose Sanchez and Father Jose Altamira, scouting for possible future mission locations. This began the earliest sustained settlement of the region by non-natives that same year with the establishment of the Mission San Francisco Solano, at Sonoma, with Napa County within its jurisdiction (Hoover et al., 1990: 242-243).

In August 1821 the Treaty of Cordova was signed, recognizing the independence of the Mexican Empire (Rives, 1913). This event marked the beginning of the short-lived Mexican Period in Alta California. Mexico codified its policy of colonization of the frontier lands in 1824 (Hayes, 2007). The young government sought to fend off foreign influence by granting private property to native Mexicans and naturalized citizens. In 1828 the regional governors were given authority to issue grants, yet were precluded from implementing them in areas subject to mission control. Following secularization, vast expanses of Alta California were available for grants, the majority of which were made after 1834 (Hayes, 2007:68). The limits of the often enormous land grants were recorded on *diseños,* which generally consisted of no more than a vague sketch depicting geographic features and boundaries. The rather informal structure of Mexican land tenure in the 1830s would lay the groundwork for years of legal battles to perfect land titles during the American period that began a decade later and eventually the land grant system failed.

The 17,962-acre Rancho Carne Humana, granted to Edward Turner Bale in 1843, is the land grant nearest to the project area (Beck and Haase 1974:29; Hoover et al. 1990:232; State Lands Commission 1982:73-74). The primary geographical focus of many of the ranchos in the Napa region was valley land, avoiding the rugged brush covered surrounding hills. The valley bottomlands provided places to grow crops, pasture animals, and exploit

relatively reliable freshwater resources. Consequently, with the early focus being on valley lands, settlement of upland places and lands outside the valley, such as the present study area, was often delayed-in some cases to the recent past.

A community of Americans spread into the interior of Mexican California in the decades after American Jedediah Smith blazed an overland trail in 1826. As a result of Smith opening a route to the interior of California, additional trappers and pioneers emigrated to California. The Hudson's Bay Trading Company soon followed, utilizing the Siskiyou Trail from their outpost at Fort Vancouver. These early fur traders likely introduced malaria into the Sacramento Valley in 1833, resulting in an epidemic that killed tens of thousands of native people by 1846 (Hurtado, 1988). Disease spread rapidly into the surrounding regions and devastated the local indigenous people, including the Wappo and their neighbors. Subsequent Euro-American settlement of the region was enabled, in large part, by the introduction of exotic diseases that decimated the native populations of California.

During the American period Napa County was establish as part of the original 27 counties, with the City of Napa always being the county seat (Hoover et al., 1990: 242). Agriculture has always been the primary economic pursuit in Napa, which began with ranching during the Mexican period. Prior to the mass influx of settlers precipitated by the Gold Rush, the hide and tallow were the primary products traded out of Alta California, with lesser amounts of wool. Following the mass emigration to California sparked by the Gold Rush, several boom towns sprung up in modern Napa County including Napa, St. Helena, Yountville, and Calistoga. Since that time viticulture has been an important product of Napa County, which has remained largely rural and agricultural in nature.

4.4.1-3 EXISTING PROPERTY SETTING

Tom Origer and Associates conducted a cultural resources survey for a portion of the Jasud Estate property in 2010 and early 2011. The investigation covered approximately 15 acres of the property, roughly within the proposed Timber Harvest Plan (THP) footprint. All cultural resources work was performed in compliance with the California Environmental Quality Act (CEQA), Public Resources Code (PRC) Section 21083.2, CEQA *Guidelines* 15064.5, and PRC Section 5024.1.

On March 21, 2011, the State of California Native American Heritage Commission (NAHC) was asked to review the Sacred Lands file for information on Native American cultural resources on the property, by Tom Origer and Associates. A response was received on March 23, 2011 stating that the search of the sacred lands file failed to indicate the presence of Native American cultural resources in the immediate area. The NAHC provided a list of Native American organizations and individuals for further consultation. These individuals were contacted by letter on March 21, 2011.

A records search was conducted at the Northwest Information Center (NWIC) of the California Historical Resources Information System (CHRIS) by NWIC staff at the request of Tom Origer and Associates (NWIC file no. 10-0905). The NWIC, an affiliate of the State of California Office of Historic Preservation, is the official state repository of archaeological and historic records and reports for a 16-county area that includes Napa County, and is housed at Sonoma State University, Rohnert Park, California. The search was conducted to identify previous archaeological surveys and recorded sites within the property for the Proposed Project and included, but was not limited to, a review of the following:

- National Register of Historic Places;
- California Register of Historic Places;
- California Historical Landmarks;
- California Points of Historical Interest listing (as listed in the Historic Property Directory);
- Historical maps;
- Ethnographic literature; and
- Other pertinent historic data.

Other sources reviewed included the *California Inventory of Historical Resources* (California Office of Historic Preservation, 1976), the California Office of Historic Preservation's *Five Views: An Ethnic Historic Site Survey for California* (1988), *California Historical Landmarks* (1990), California Points of Historical Interest (1992), and the *Historic Properties Directory Listing for Napa County* (2008). The *Historic Properties Directory* includes the *National Register of Historic Places* (2010), the *California Register of Historical Resources*, and the most recent listings (through February, 2008) of the *California Historical Landmarks and California Points of Historical Interest* prior to fieldwork.

The records search found that no cultural resources have been identified within or adjacent to the property; yet no cultural resource surveys had been conducted previously onsite. However, one survey has been conducted on an adjacent parcel and five studies have been conducted within a one-mile radius of the property. These studies have identified three isolated prehistoric specimens and have reported one cultural resource within one-half mile of the property.

The field survey conducted by Tom Origer and Associates revealed one previously unrecorded cultural resource, called the "Jasud Spring Site" located in the southwest corner of the property (outside of the project footprint). The resource is described as a moderately dense obsidian flake scatter with four non-diagnostic flakestone artifacts observed (Origer and Del Bondio, 2011).

A couple of outbuildings were observed on the property during the field visit. However, the buildings did not appear of sufficient age to qualify for recording or qualify as a historic resource. Consultation of historic maps revealed no extant buildings to be considered for significance. No historic resources were identified during the cultural resources study (Origer and Del Bondio, 2011).

4.4.2 REGULATORY FRAMEWORK

4.4.2-1 CULTURAL RESOURCES DEFINED

Cultural resources are defined as buildings, sites, structures, or objects, each of which may have historical, architectural, archaeological, cultural, and/or scientific importance. Numerous laws, regulations, and statutes at the state and local level govern archaeological and historic resources deemed to have scientific, historic, or cultural value. The pertinent regulatory framework of these laws is summarized below.

4.4.2-2 CALIFORNIA ENVIRONMENTAL QUALITY ACT (CEQA)

CEQA requires that, for projects financed by, or requiring the discretionary approval of public agencies in California, the effects that a project has on historical and unique archaeological resources must be considered (Public Resources Code [PRC] Section 21083.2). Historical resources are defined as buildings, sites, structures, or objects, each of which may have historical, architectural, archaeological, cultural, or scientific importance (PRC Section 50201). The CEQA Guidelines (Section 15064.5) define three cases in which a property may qualify as a historical resource for the purpose of CEQA review:

A. The resource is listed in or determined eligible for the listing in the California Register of Historical Resources (CRHR). Section 5024.1 defines eligibility requirements and states that a resource may be eligible for inclusion in the CRHR if it:
    1. Is associated with events that have made a significant contribution to the broad patterns of California's history and cultural heritage;
    2. Is associated with the lives of persons important in our past;
    3. Embodies the distinctive characteristics of a type, period, region, or method of construction, represents the work of an important creative individual, or possesses high artistic values; or
    4. Has yielded, or may be likely to yield, information important in prehistory or history.
B. Properties must retain integrity to be eligible for listing on the CRHR. Properties that are listed in or eligible for listing in the National Register of Historic Places (NRHP) are considered eligible for listing in the CRHR, and thus are significant historical resources for the purpose of CEQA (PRC section 5024.1(d)(1)).

C. The resource is included in a local register of historic resources, as defined in section 5020.1(k) of the PRC, or is identified as significant in a historical resources survey that meets the requirements of section 5024.1(g) of the PRC (unless the preponderance of evidence demonstrates that the resource is not historically or culturally significant).
D. The lead agency determines that the resource may be a historical resource as defined in PRC section 5020.1(j), 5024.1, or significant as supported by substantial evidence in light of the whole record.

PRC Section 21083.2 governs the treatment of unique archaeological resources, defined as "an archaeological artifact, object, or site about which it can be clearly demonstrated" as meeting any of the following criteria:

1. Contains information needed to answer important scientific research questions and that there is a demonstrable public interest in that information.
2. Has a special and particular quality such as being the oldest of its type or the best example of its type.
3. Is directly associated with a scientifically recognized important prehistoric or historic event or person.

4.4.2-3 LOCAL REGULATIONS, GOALS, AND POLICIES

Napa County General Plan – Community Character Element

The General Plan identifies the following goal and policies to preserve and enhance cultural resources in Napa County (Napa County, 2008):

Goal CC-4: Identify and preserve Napa County's irreplaceable cultural and historic resources for present and future generations to appreciate and enjoy.

Policy CC-19: The County supports the identification and preservation of resources from the County's historic and prehistoric periods.

Policy CC-21: Rock walls constructed prior to 1920 are important reminders of the County's agricultural past. Those walls which follow property lines or designated scenic roadways shall be retained to the extent feasible and modified only to permit required repairs and allow for openings necessary to provide for access.

Policy CC-23: The County supports continued research into and documentation of the county's history and prehistory, and shall protect significant cultural resources from inadvertent damage during grading, excavation, and construction activities.

Policy CC-30: Because the County encourages preservation of historic buildings and structures in place and those buildings and structure must retain "integrity" to be considered historically significant, the County shall discourage scavenging of materials from pre-1920 walls and other structures unless they are beyond repair.

Napa County Code 18.04.010
Under Title 18, Zoning of the Napa County Code, the Board of Supervisors made several findings with respect to the zoning ordinance. One of those findings (F.15) relates to the objective of preserving sites and structures of a special historical, archaeological, or architectural character and to provide for the maintenance and development of appropriate settings for such resources.

4.4.3 IMPACTS ANALYSIS

4.4.3-1 SIGNIFICANCE CRITERIA

Based on CEQA *Guidelines* Section 15064.5 and Appendix G of the CEQA *Guidelines*, a project would have significant adverse impacts to cultural resources if the project would:

- Cause a substantial adverse change in the significance of a historical resource as defined in Section 15064.5 (a);
- Cause a substantial adverse change in the significance of a unique archaeological resource pursuant to Section 15064.5 (c);
- Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature; or
- Disturb any human remains, including those interred outside of formal cemeteries.

Any one of the above-cited impacts to a historical resource, as defined by public resources code (PRC) Section 5020.1, constitutes a substantial adverse change pursuant to the California Environmental Quality Act (CEQA). A substantial adverse change to a historical resource is considered a significant impact on the environment.

4.4.3-2 IMPACTS AND MITIGATION MEASURES

This section identifies impacts to cultural resources, which could result from construction, operation, or maintenance of the project. Impacts were analyzed by reviewing various sources regarding the nature and location of cultural resources located within the property, through a field examination of the known resources (Origer and Del Bondio, 2011), and by overlaying project components on maps of the resources. State impact significance criteria were applied to each known resource relative to the project design.

Only one cultural resource (the Jasud Spring Site) has been identified within the property. However, this area will be largely buffered from project activities by the 50 foot setbacks for the spring and adjacent wet area so the likelihood for disturbance is low. Formal resource evaluations of this site have not been undertaken.

Impact 4.4-1: If agricultural or timber harvesting activities occur at the location of the identified Jasud Spring Site cultural resource such activities could negatively impact this cultural resource. This is a potentially significant impact. However, since this area will be largely buffered from project construction activities by the 50 foot setbacks for the spring and adjacent wet area, which are part of the Proposed Project's design, the likelihood for disturbance is low. Implementation of **Mitigation Measure 4.4-1** below would reduce this potential impact to less than significant.

Mitigation Measure 4.4-1: The Jasud Spring archaeological site shall be avoided by all ground disturbing activities during project construction and a staked, visible boundary shall be marked around its perimeter by the Applicant or the Applicant's designee using the scale plan view map of the Jasud Spring Site prepared by Tom Origer and Associates. The Applicant shall install and maintain protective fencing along the outside of the perimeter to ensure protection during construction. During operation of the Proposed Project, no ground disturbing activities shall occur within the archaeological site's perimeter.

Implementation of this mitigation measure would reduce this impact to less than significant.
Impact 4.4-2: The project implementation has the potential to negatively impact previously unknown cultural resources within the property. This is a potentially significant impact.

Mitigation Measure 4.4-2: There is a possibility that subsurface archaeological deposits may exist within the proposed vineyard areas, as archaeological sites may be buried with no surface manifestation, or may be obscured by vegetation. In accordance with CEQA *Guidelines* Section 15064.5 (f), should any previously unknown prehistoric or historic resources, such as, but not limited to, obsidian and chert flaked-stone tools or toolmaking debris; shellfish remains, stone milling equipment, concrete, or adobe footings, walls, filled wells or privies, deposits of metal, glass, and/or ceramic refuse be encountered during onsite construction activities, earthwork within 100 feet of these materials shall be stopped and the Applicant shall consult with a professional archaeologist. Once the archaeologist has had the opportunity to evaluate the find he/she shall consult the local Cal Fire Archaeologist regarding the results of the evaluation and appropriate site treatment options, as necessary. Said measures shall be carried out prior to any resumption of related ceased earthwork. All significant cultural resource materials recovered shall be subject to scientific analysis, professional museum curation, and a report prepared by the qualified archaeologist according to current professional standards and a copy of the draft report provided to the local Cal Fire Archaeologist for review and approval prior to finalization of it.

Implementation of this mitigation measure would reduce this impact to less than significant.

Impact 4.4-3: The project implementation could result in the discovery and disturbance of unknown human remains.

While unlikely, there is always the possibility that ground disturbing activities such as earth removal, rock removal and trenching for irrigation lines could result in the discovery and disturbance of unknown human remains within the property by disturbing both surface and subsurface soils. This is a potentially significant impact.

Mitigation Measure 4.4-3: In the event that human remains are discovered, the provisions of the California Health and Safety Code Section 7050.5 (b) shall be followed, including contacting the Napa County Coroner within 24 hours of the find. Upon determining the remains as being Native American in origin, the Coroner would be responsible for contacting the Native American Heritage Commission (NAHC) within 24 hours. The NAHC has various powers and duties to provide for the ultimate disposition of any Native American remains, as does the assigned Most Likely Descendant (MLD), who is designated by the NAHC.

Implementation of this mitigation measure would reduce this impact to less than significant.

REFERENCES

Barrett. Samuel A., 1908. The Ethnogeography of Pomo and Neighboring Indians. *University of California Publications in American Archaeology and Ethnology* 6(1):1-332. Berkeley, California.

Beck, Warren A. and Ynez D. Haase, 1974. *Historical Atlas of California*. University of Oklahoma Press. Norman, Oklahoma.

Bennyhoff, J. A., 1994. The Napa District and Wappo Prehistory. In *Toward a New Taxonomic Framework for Central California Archaeology: Essays by James A. Bennyhoff and David A. Fredrickson*, edited by R. E. Hughes, pp. 65-74. Contributions of the University of California Archaeological Research Facility, No. 52, Berkeley.

California Office of Historic Preservation (OHP), 1976. *California Inventory of Historic Resources*. State of California, Department of Parks and Recreation, Sacramento.

OHP, 1988. *Five Views: An Ethnic Historic Site Survey for California*. State of California, Department of Parks and Recreation, Sacramento.

OHP, 1990. *California Historical Landmarks*. State of California, Department of Parks and Recreation, Sacramento.

OHP, 1992. *California Points of Historical Interest*. State of California, Department of Parks and Recreation, Sacramento.

OHP, 2008. *Historic Properties Directory,* Listing by City through March 2006. State of California, Office of Historic Preservation, Sacramento.

OHP, 2010. *Historic Properties Directory, City of Napa through February 2010*. State of California, Office of Historic Preservation, Sacramento.

Caughey, J.W., 1940. *California*. Prentice-Hall, Englewood Cliffs, NJ.

Elsasser, A. B., 1978. Development of Regional Prehistoric Cultures. In *California*, edited by Robert F. Heizer, pp. 37-57. Handbook of North American Indians, vol. 8, William C. Sturtevant, general editor. Smithsonian Institution, Washington, D.C.

Fredrickson, David A., 1973. *Early Cultures of the North Coast of the North Coast Ranges, California*. Unpublished Ph.D. dissertation, Department of Anthropology, University of California, Davis.

Fredrickson, David A., 1974. Cultural Diversity in Early Central California: A View from the North Coast Ranges. *Journal of California Anthropology* 1(1):41-53.

Groza, R. D., 2002. An AMS Chronology for Central California Olivella Shell Beads. Master's thesis, Department of Anthropology, San Francisco State University.

Hayes, Derek, 2007. *Historical Atlas of California*. University of California Press, Berkeley.

Heizer, R.F., 1953. The Archaeology of the Napa Region. *Anthropological Records*. Vol. 12, No. 6. Berkeley, California.

Hoover, Mildred B., Hero E. Rensch, Ethel G. Rensch, and William N. Abeloe, 1990. *Historic Spots in California*. Revised by Douglas E. Kyle. Stanford University Press, Stanford, California.

Hurtado, A., 1988. *Indian Survival on the California Frontier*. Yale University Press, New Haven, CT.

Justice, N.D., 2002. *Stone Age Spear and Arrow Points of California and the Great Basin*. Indiana University Press, Bloomington.

Kroeber, Albert L., 1925. *Handbook of the Indians of California*. Bureau of Ethnology Bulletin 78. Smithsonian Institution. Washington, D.C. Reprinted 1976. Dover Press. New York.

Meighan, C.W., 1955. Archaeology of the North Coast Ranges, California. *University of California Archaeological Survey Reports* 30:1-39. Berkeley, California.

Milliken, R., R. Fitzgerald, M. Hylkema, R. Groza, T. Origer, D. Bieling, A. Leventhal, R. Wiberg, A. Gottsfield, D. Gillette, V. Bellifemine, E. Strother, R. Cartier, and D. Fredrickson, 2007. Punctuated Culture Change in San Francisco Bay Area. In *California Prehistory: Colonization, Culture and Complexity*. Edited by T.L. Jones and K.A. Klar, pp. 99-124. Altimira Press, Lanham, MD.

Moratto, Michael J., 1984. *California Archaeology*. Academic Press, Orlando.

Napa County, 2008. *General Plan*. Available online at: http://www.countyofnapa.org/pages/departmentcontent.aspx?id=4294970195.

National Register of Historic Places Index of Listed Properties, 2010. United States Department of the Interior, Washington, D.C. On file, North Central Information Center, California Historical Resources Information System, California State University, Sacramento. Computer listing for 2010.

Nelson, Nels C., 1909. Shellmounds of the San Francisco Bay Region. *University of California Publications in American Archaeology and Ethnology* 7 (4):309-356. Berkeley, California.

Origer, Thomas and Lauren Del Bondio, 2011. *A Cultural Resources Survey for the Jasud Estate LLC, Napa County, California*. On file, AES, Sacramento, CA.

Powers, Stephen, 1877. *Tribes of California. Washington D.C.: U.S. Department of the Interior, Geographical and Geological Survey of the Rocky Mountain Region, Contributions to North American Ethnology, III*. Reprinted 1976 as Tribes of California. Berkeley and Los Angeles: University of California Press.

Rives, George L., 1913. *The United States and Mexico: 1821 – 1848*. Charles Scribner's Sons, New York.

Sawyer, Jesse, 1978. Wappo. In California, edited by Robert F. Heizer, pp. 256-273. *Handbook of North American Indians*. Vol. 8, William C. Sturtevant, general editor. Smithsonian Institution. Washington, D.C.

State Lands Commission, 1982. Grants of Land in California Made by Spanish or Mexican Authorities. State Lands Commission. Sacramento, California.

4.5 GEOLOGY AND SOILS

4.5.1 SETTING

4.5.1-1 GEOLOGY AND TOPOGRAPHY

The property is located within the Kortum Canyon Creek watershed in the California Coastal Ranges. These ranges occur in northwest trending ridges and valleys that extend along the Pacific Coast from Oregon to Southern California. The Coastal Ranges are comprised of the Franciscan Assemblage, an accreted tectonostratigraphic terrane of heterogeneous rocks comprised of marine sediments, volcanic rocks, and high-pressure metamorphic rocks, all faulted and folded due to the collision of the Farallon and North American Tectonic Plates and subsequent shearing along the San Andreas Transform Fault. These rocks are among the oldest in the Napa County region.

Stratigraphically above the Franciscan Assemblage is the Sonoma Volcanics which lie to the east in the Vaca Mountains and envelope the north and northeast crests and flank of Diamond Mountain (USGS, 1963). In most locations, the older Franciscan Assemblage is present at a depth below the Sonoma Volcanics. Formed from volcanic activity in the Sonoma/Napa region about three to 11 million years ago, the Sonoma Volcanics are comprised of layers of various Pliocene- and possible Miocene-age volcanic deposits of andesitic to basaltic lava flows (Fox et al., 1973). The various components are subdivided into volcanic rocks including: rhyolite (light colored, fine-grained, volcanic rock), tuff (cemented volcanic ash), and other pyroclastic (explosive or aerially ejected volcanic material) rocks. These chemically-variable and lithologically-diverse rocks underlie the entire property. The Sonoma Volcanic tuff is mapped underlying the lavas and crop out in the drainage channels located east and north of the site (Gilpin, 2011).

The Proposed Project is located within the 1,852-acre Kortum Canyon Creek watershed and contains two Class III watercourses, one Class IV drainage, and a natural spring with adjacent wet area. The watershed contains the foothills of the Napa Valley on the west side and crosses the Napa Valley to the east, just below the town of Calistoga.

The property is located on and adjacent to a very gently inclined northeast-facing bench on the edge of Diamond Mountain. Proposed vineyard blocks A, E, and parts of I and J occupy the bench areas, while proposed vineyard blocks B, C, F, and G occupy the slope below the bench to the northeast. Proposed vineyard block H lies to the southeast on a slope below the benchland, and proposed vineyard blocks K and L extend up the slope above the benchland towards the southwest (**Figure 3-4b**). Elevations at the property are 1,630 feet above sea level (msl) to 1,890 feet above msl. There is a small drainage channel (Class III Stream) in the southeastern part of the property, separating proposed vineyard block H from vineyard block G. A prominent and well defined natural spring located at 1,818 feet above

msl in the southwestern corner of the property flows down just below proposed vineyard block K. Presently, overflow from the spring creates a wet area surrounding the spring site. This spring and wet area will be protected by a minimum 50 foot buffer from any impacts from the Proposed Project. The wet area terminates before it meets the proposed farm avenue between vineyard blocks A and E, which is upslope of the beginnings of a Class III watercourse that forms in the northwest corner of the property and flows north before exiting the property boundary.

The property overall shows favorable slope stability and drainage conditions with low slope inclinations, as well as a strong to very strong underlying andesitic lava and tuff facies to help preserve ground stability. There is an existing road onsite, which starts to the north before winding towards the center of the property near a former homesite. The existing road and homesite are located outside of the development footprint. Under the ECP for the Proposed Project, this road would be improved (**Appendix B**). Presently, this road shows evidence of erosion of cut slopes, road tread, and fill slopes. The northern portion of the road segment comprises the entry drive to the property and is heavily accessed. There is strong evidence and observation of erosion along the cut slopes. The portion of the road located in the center of the property has a moderate grade with bed width ranging from 10 to 13 feet. Observed cut slopes were marked at a height between two and four feet and are comprised of native soil and rocks. The road has no preexisting erosion control features.

4.5.1-2 SOILS

Soil types and their characteristics in the Napa Valley subregion are controlled in part by their location in either valleys or hillsides. The surficial geologic deposits of the Napa Valley subregion consist of widespread, locally-deep alluvium, and on the flanking ridge systems generally discontinuous deposits of colluviums, soil creep, and landslide deposits. The Napa Valley alluvium, or deposits of clay, silt, sand, and gravel left by flowing streams and runoff, consists primarily of alluvial fan, stream channel, flood plain deposits, and terrace deposits. The soils in Napa Valley are generally very deep, have high productivity, and are often used for vineyards, orchards, and pastures. The colluvial and landslide deposits are typically more heterogeneous in composition and consist of various combinations of mostly unconsolidated soil and rock fragments.

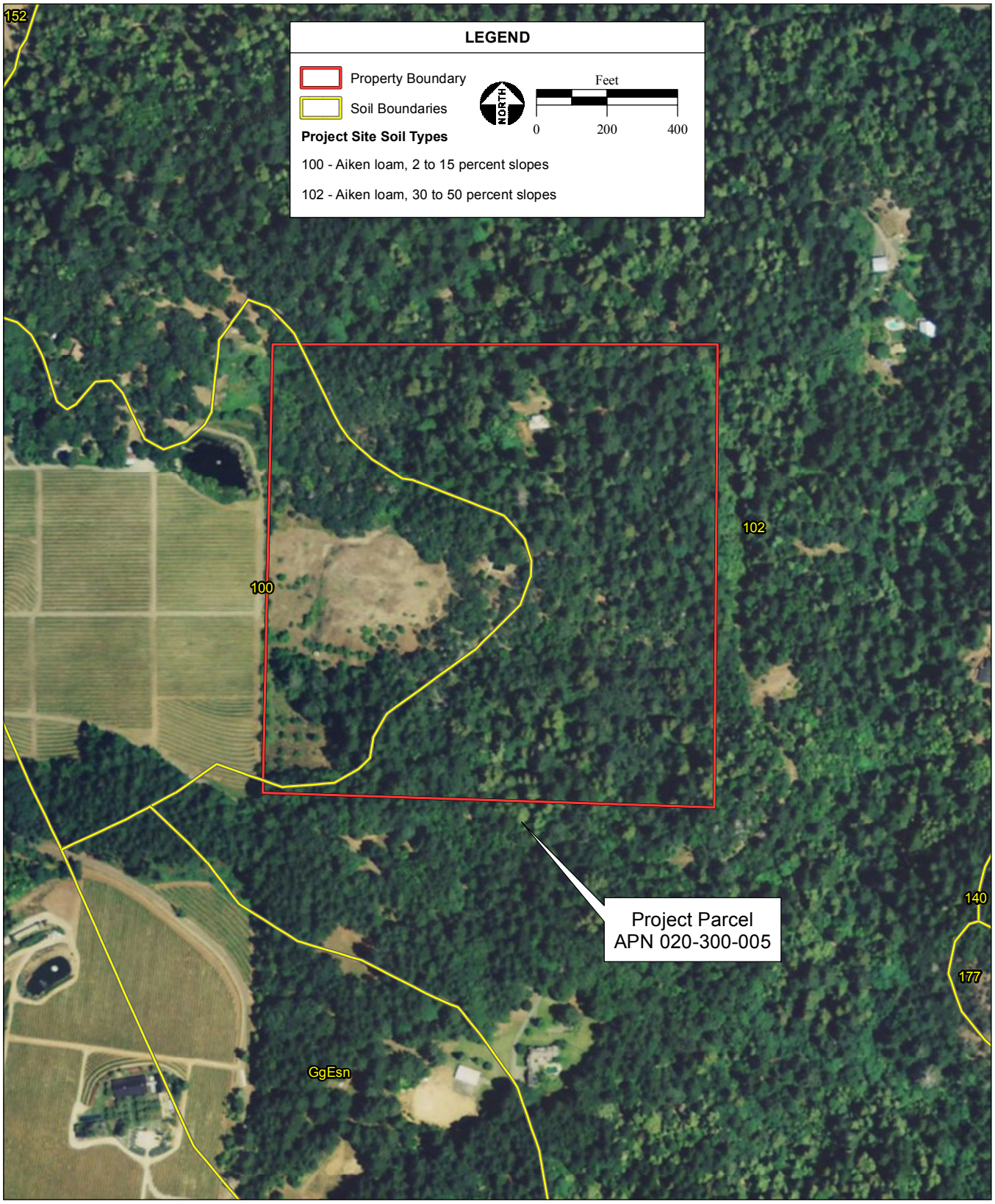
Soils on the property are shown in **Figure 4.5-1** and their characteristics pertaining to erosion and hydrologic factors are summarized in **Table 4.5-1**. The soil is mapped at the site as the Aiken loam series, on 2 to 15 percent, and 30 to 50 percent slopes. The Aiken series consists of well drained soils on uplands and is characterized as being formed in material weathered from basic igneous rock (USDA, 1978). These soils form on broad, gently sloping tabular ridges or benches with moderately steep to steep side slopes. Permeability is moderately low, with the effective rooting depth at 40 to 60 inches or more.

In a representative profile the surface layer is a reddish brown, medium acid, and a slightly acid loam eight inches thick. The subsoil is a medium acid, reddish brown clay loam and a medium acid, yellowish red clay 36 inches thick. Hard basic igneous rock can be found at a depth of over 40 inches.

TABLE 4.5-1
SOIL CHARACTERISTICS ON THE PROPERTY

Soil	Slope (%)	Landform	Drainage	Surface Runoff	Erosion
100 – Aiken Loam	2 to 15	Tabular ridges	Well drained	Medium	Slight
102 – Aiken Loam	30 to 50	Tabular ridges	Well drained	Medium	Moderate

[1] Erosion hazard represents the potential for erosion of soils after disturbance activities. A rating of "slight" indicates that erosion is unlikely under ordinary climatic conditions; "moderate" indicates that some erosion is likely and that erosion-control measures may be needed; "severe" indicates that erosion is very likely and that erosion-control measures are advised; and "very severe" indicates that significant erosion is expected, loss of soil productivity and off-site damage are likely, and erosion-control measures are costly and generally impractical.
Source: USDA, 1978



SOURCE: USDA SSURGO Soils Surveys of Napa County,12/2007 ;
NAIP Aerial Photograph, 6/7/2009; ESRI Data, 2011; AES, 2011

Figure 4.5-1
Soils Map

4.5.1-3 SEDIMENT EROSION AND TRAPPING

Sediment Erosion

Sediment erosion is the mechanical breakdown of rock material and the removal of the resultant materials, such as soil and rock particles, by water, wind, and ice. The potential for erosion of a particular area is dependent upon the geology, slope, vegetation cover, hydrology, precipitation, and the intensity of associated storm events. Shallow soil creep is the slow downward movement of soil and loose rock on slopes. On steep hillside areas the potential for erosion is greater and rilling, rutting, and damaging of channel systems can occur. Along many natural drainage courses on both hillsides and valley areas, stream and river flow can result in bank erosion. In overland flow areas (OFAs), or areas where the ground is impermeable or semi-impermeable, sediment is easily dislodged and transported to receiving waters. Large-scale erosion can occur during shallow and deep-seated landsliding or earthflows, particularly during high intensity storm events.

According to vineyard plot studies in the Napa River Basin, the annual surface erosion from hillside vineyards with limited straw or cover crops ranges from 2.3 to 23 tons per acre (tons/acre) (Napa County RCD, 1997). Notable amounts of sheetwash and rilling may also occur during large-magnitude storms due to the hydrologic effects of wildfires or vegetation removal. Large rainstorms that sweep across the Napa River watershed periodically induce both shallow and deep-seated landsliding. Landsliding is further discussed in **Section 4.5.1-5** below.

On the property, pre-project hillside erosion is a sediment source. Two onsite Class III streams are the primary means of off-site flow. The existing onsite road is also a significant sediment source. Although construction would temporarily increase runoff sedimentation, with the implementation of the erosion control features in the ECP, post-project sediment erosion would be reduced significantly; approximately 84 percent of expected sediment delivery from the vineyards and approximately 80 percent of expected sediment delivery from the on-site road would be eliminated (OEI, 2011a; OEI, 2011b).

Sediment Trapping

Not all sediment produced by erosion is delivered to receiving waters. Some sediment is trapped in-route by sedimentation in onsite features. The ECP for the Proposed Project provides for maximum vineyard cover and runoff drainage to the diversion ditches, sediment basins, and level flow spreaders. Rock stabilization and water bars are also a strategy to control and trap sediment drainage. Runoff management practices, developed in part to prevent increases in peak runoff from the site, also promote on-site deposition of sediment eroded from vineyard fields. Virtually all the vineyard runoff that could be expected to reach the Class III stream channels is routed through detention ditches and sediment basins on the property (OEI, 2011a). Thus, sediment deliveries to adjacent streams is less for post-

project conditions, which nearly eliminates the potential delivery of sand and coarse silt to watercourses downstream, including the Napa River.

4.5.1-4 GEOLOGIC STABILITY

Landslides

Napa County prepared Geographic Information System (GIS) maps of landslide deposits and areas of potential landslide hazards for the Napa County Environmental Baseline Data Report (NCCDPD, 2005). The data was collected from the interpretation of U.S. Geological Survey (USGS) aerial photographs from sources published over several decades. There are no areas susceptible to landsides identified within the property.

Seismicity

Seismic Potential

Numerous faults exist throughout the Bay Area of Northern California in the regional vicinity of the property. The majority of active faults within the Bay Area are components of the San Andreas Fault zone, a broad north-northwest trending system that extends along coastal California. An active fault is a fault that shows displacement within the last 11,000 years (the Holocene epoch), and therefore, is considered more likely to generate a future earthquake than a fault that has not shown signs of recent activity. A potentially active fault is one that has shown activity in the last 2.5 million years (the Quaternary Period). A fault that the California Geological Survey (CGS) determines to be sufficiently active and well-defined is zoned as an earthquake fault zone according to mandates of the Alquist-Priolo Earthquake Fault Zoning Act of 1972.

When an earthquake occurs, energy waves are radiated outward from the fault. The amplitude and frequency of earthquake ground motions partially depends on the material through which it is moving and distance from the source. The earthquake force is transmitted through hard rock in short, rapid vibrations, while this energy movement becomes a long, high-amplitude motion when moving through soft ground materials, such as valley alluvium. The force an earthquake applies to a structure is expressed in terms of a percentage of gravity (g). For example, an earthquake that produces 0.30 g horizontal ground acceleration will impose a lateral force on a structure equal to 30 percent of its total vertical weight. The intensity of an earthquake is expressed in terms of its effects, as measured by the Modified Mercalli Intensity Scale, and in terms of the quantity of energy released, or magnitude, as measured by the Richter scale. On the Richter scale every one-unit increase indicates an increment of roughly 30 times the energy.

The local area's structural geology is dynamic with several active faults being mapped in the vicinity of the Proposed Project; however there is no evidence of landslides or pervasive shallow soil creep on the property (Dwyer et al., 1976; Gilpin, 2011). Shallow soil creep is

the slow downward movement of soil and loose rock on slopes. The closest potentially active fault to the property is the Maacama Fault located approximately 6.7 miles west of the site. The Maacama Fault is classified as a type B dextral strike-slip fault by the Universal Building Code (ICBO, 1998; Gilpin, 2011) and is capable of a Moment Magnitude of a 6.9 earthquake. The Rogers Creek Fault, the next closest active fault, lies approximately 9.1 miles west of the property and is capable of a Moment Magnitude of a 7.0 earthquake. See **Figure 4.5-2** for a map of Napa County faults.

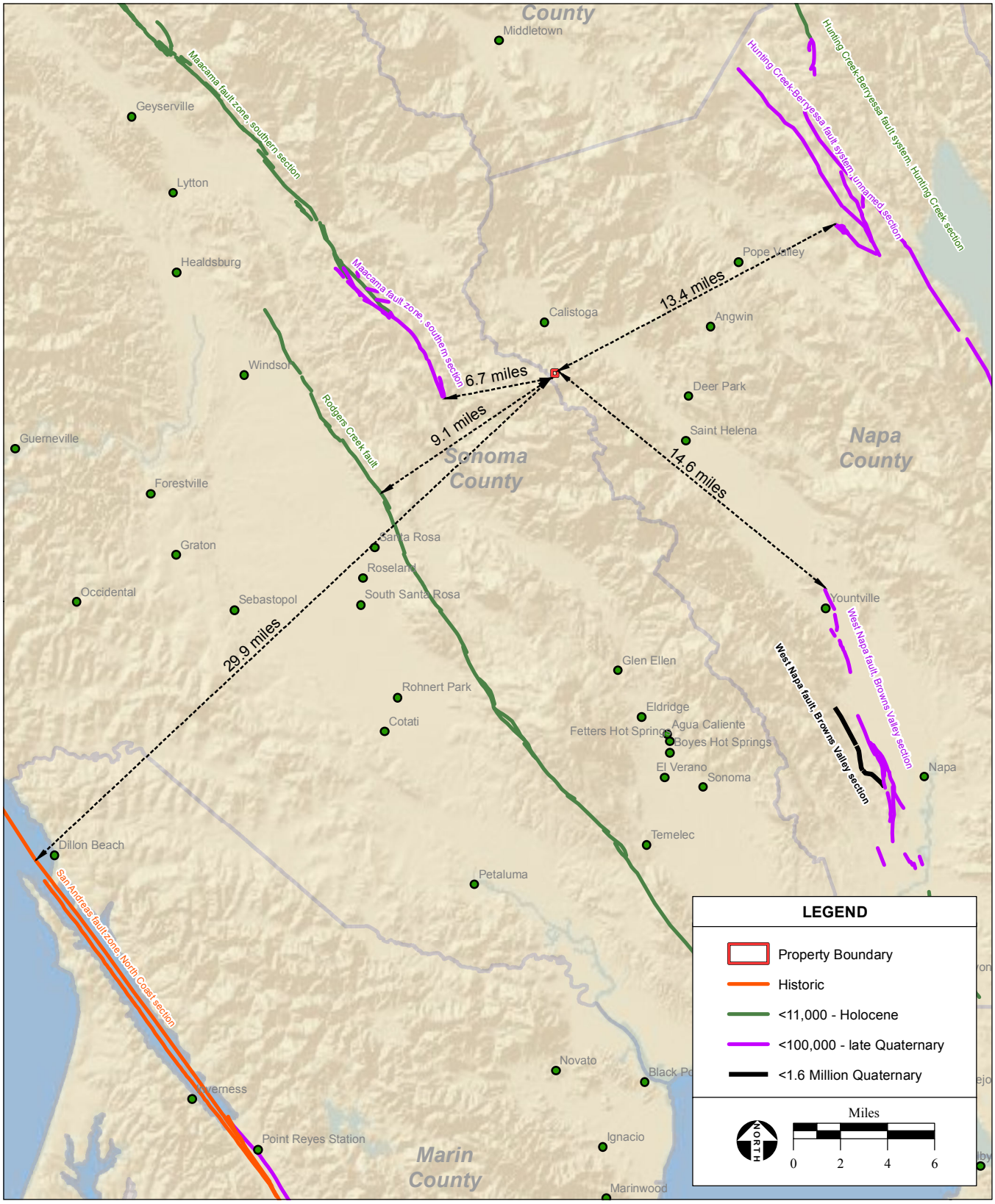
Numerous earthquakes have occurred in the Napa County region within historic times. Between 1735 and 2005, 97 earthquakes were recorded with a magnitude of 5.0 on the Richter scale or larger within 200 kilometers (or approximately 124 miles) of the center of Napa County (NCCDPD, 2005). Seven substantial earthquakes have been recorded since 1836 within 61 miles of the center of Napa County, and had median peak bedrock accelerations of 0.04 g to 0.10 g. This includes the 1906 earthquake of magnitude 8.3 with a median peak bedrock acceleration of 0.10 g located 55 miles from the center of Napa County. Other earthquakes have occurred in the vicinity of Napa County along the previously mentioned faults in the Bay Area, including the 1989 earthquake along the Loma Prieta Fault.

To estimate the probability of future earthquake events in the Bay Area, USGS considered potential sources of an event on seven different fault systems in the Bay Area. Based on a combined probability of all seven fault systems and background earthquakes, there is a 62 percent chance of a magnitude 6.7 or larger earthquake occurring in the Bay Area by the year 2032. Smaller earthquakes, between magnitudes 6.0 and 6.7, which are capable of causing considerable damage, have about an 80 percent chance of occurring in the Bay Area by 2030 (USGS, 2003).

Seismic Hazards

Seismic hazards are effects that are caused by surface fault rupture and seismic shaking from a seismic event. Surface fault rupture occurs when a fault breaks through to the ground surface during a seismic event. As discussed above, the property is susceptible to little hazard from surface rupture along an active fault trace.

Seismic shaking can result in structural damage. This risk is high because shaking damage can be caused by any of the active faults in the Bay Area discussed above. The severity of the shaking damage at a particular location depends on a number of factors, including the



SOURCE: USGS Earthquake Hazards Program, 2007; AES, 2011

Figure 4.5-2

Napa County Faults

magnitude of the earthquake, the distance to its epicenter, and the nature and thickness of the deposits at the location. Areas that are subject to the greatest ground shaking damage are anticipated to be within Napa County's various valleys, because they consist of deep, unconsolidated alluvial deposits underlain by saturated estuarine deposits, which are subject to higher amplitude and longer duration shaking motions (NCCDPD, 2005).

Ground failures, or secondary effects, from ground shaking can extend many miles from the earthquake fault that generated the shaking. Ground failures include landsliding, differential settlement, lateral spreading, and liquefaction. Landsliding triggered by ground shaking occurs in the same types of hilly or mountainous terrains that are susceptible to non-seismically induced sliding events. Ground shaking can reactivate dormant landslides, cause new landslides, and accelerate or aggravate movement on active slides. Differential settlement is the non-uniform densification of loose soils that occurs during strong ground shaking and causes uneven settlement of ground surface. Differential settlement could occur in numerous locations, but most likely the valley areas of Napa County. Lateral spreading is a ground failure in which a subsurface layer of soil liquefies, resulting in the overlying soil mass deforming laterally toward a free face. Limited lateral spreading is extremely unlikely given the project area's low probability for liquefaction on the slopes of the property. The potential for seismic ground shaking is mapped by the Association of Bay Area Governments (ABAG) as low in the project vicinity, and therefore, coupled with the well-drained soils located on property, the potential of seismically-induced landslides is fairly low (ABAG, 2011).

Liquefaction is a process in which sandy, saturated soils become liquefied and lose their bearing capacity during seismic ground shaking. As a result, sufficiently liquefied soils can no longer support structures built on or beneath them. Liquefaction potential is dependent on such factors as soil type, depth to groundwater, degree of seismic shaking, and the relative density of the soil. Soils most susceptible to liquefaction are saturated, clean, loose, uniformly graded, fine-grained, and unconsolidated materials that are most commonly associated with alluvial valleys with high groundwater levels. On a countywide basis, the potential for liquefaction-induced ground failures is relatively low, since only about 20 percent of the County is characterized as an alluvial valley. ABAG creates maps of Bay Area counties that show the susceptibility of mapped areas to liquefaction based on the presence of water-saturated sand and silty materials that may be more prone to liquefaction than other soils. The property's susceptibility to liquefaction is considered very low (ABAG, 2011).

4.5.2 REGULATORY FRAMEWORK

4.5.2-1 NAPA COUNTY

The Napa County General Plan (General Plan; 2008) serves as a broad framework for planning within Napa County. State law requires general plans to cover a variety of topics. The General Plan contains goals and policies related to open space conservation, natural resources, water resources and safety that provide guidance for issues related to geology and soils from the Proposed Project. The following goals and policies related to geology and soils in the General Plan are applicable to the Proposed Project:

Open Space Conservation Policies

Policy CON-5: The County shall identify, improve, and conserve Napa County's rangeland through the following measures:

d) Encouraging livestock management activities to avoid long-term destruction of rangeland productivity and watershed capacity through overgrazing, erosion, or damage to riparian areas.

Policy CON-6: The County shall impose conditions on discretionary projects which limit development in environmentally sensitive areas such as those adjacent to rivers or streamside areas and physically hazardous areas such as floodplains, steep slopes, high fire risk areas and geologically hazardous areas.

Natural Resources Policies

Policy CON-38: The County shall identify, improve, and conserve Napa County's sand and gravel resources, preventing removal of streambed sand and gravel in any manner that would cause adverse effects on water quality, fisheries, riparian vegetation, or flooding.

Water Resources Policies

Policy CON-48: Proposed developments shall implement project-specific sediment and erosion control measures (e.g., erosion control plans and/or stormwater pollution prevention plans) that maintain pre-development sediment erosion conditions or at minimum comply with state water quality pollution control (i.e., Basin Plan) requirements and are protective of the County's sensitive domestic supply watersheds. Technical reports and/or erosion control plans that recommend site-specific erosion control measures shall meet the requirements of the County Code and provide detailed information regarding site specific geologic, soil, and hydrologic conditions and how the proposed measure will function.

Policy CON-49: The County shall develop and implement a water quality monitoring program (or programs) to track the effectiveness of temporary and permanent Best Management Practices (BMPs) to control soil erosion and sedimentation within watershed

areas and employ corrective actions for identified water quality issues (in violation of Basin Plans and/or associated TMDLs) identified during monitoring.

Policy CON-50: The County will take appropriate steps to protect surface water quality and quantity, including the following:

g) Address potential soil erosion by maintaining sections of the County Code that require all construction-related activities to have protective measures in place or installed by the grading deadlines established in the Conservation Regulations. In addition, the County shall ensure enforceable fines are levied upon code violators and shall require violators to perform all necessary remediation activities.

Safety Goals and Policies

Goal SAF-1: Safety considerations will be part of the County's education, outreach, planning, and operations in order to reduce loss of life, injuries, damage to property, and economic and social dislocation resulting from fire, flood, geologic, and other hazards.

Goal SAF-2: To the extent reasonable, protect residents and businesses in the unincorporated area from hazards created by earthquakes, landslides, and other geologic hazards.

Policy SAF-8: Consistent with County ordinances, require a geotechnical study for new projects and modifications of existing projects or structures located in or near known geologic hazard areas, and restrict new development atop or astride identified active seismic faults in order to prevent catastrophic damage caused by movement along the fault. Geologic studies shall identify site design (such as setbacks from active faults and avoidance of on-site soil-geologic conditions that could become unstable or fail during a seismic event) and structural measures to prevent injury, death and catastrophic damage to structures and infrastructure improvements (such as pipelines, roadways and water surface impoundments not subject to regulation by the Division of Safety of Dams of the California Department of Water Resources) from seismic events or failure from other natural circumstances.

Policy SAF-9: As part of the review and approval of development and public works projects, planting of vegetation on unstable slopes shall be incorporated into project designs when this technique will protect structures at lower elevations and minimize the potential for erosion or landslides. Native plants should be considered for this purpose, since they can reduce the need for supplemental watering which can promote earth movement.

Policy SAF-10: No extensive grading shall be permitted on slopes over 15 percent where landslides or other geologic hazards are present unless the hazard(s) are eliminated or

reduced to a safe level.

4.5.2-2 NAPA COUNTY RESOURCE CONSERVATION DISTRICT

The Napa County Resource Conservation District (RCD) published the Napa River Watershed Owner's Manual in 1996. The manual contains the following objective and recommendations that pertain to the Proposed Project:

Objective G: Reduce Soil Erosion

Recommendation G2: Reduce erosion resulting from agricultural activities. Agricultural activities in the Napa River watershed include grazing, viticulture, small farms and horticulture. Soil disturbance or vegetation removal as a result of agricultural activities can result in loss of topsoil and subsequent water quality degradation. Good agricultural management can also benefit water quality and wildlife habitat, and can contribute to the overall good health of the watershed.

Relevant sub-recommendations include:

- G2.1. Emphasize erosion prevention over sediment retention as a priority in agricultural planning and operations.
- G2.2. Promote the use of permanent vegetative ground cover in vineyards. Support research, demonstrations and technology exchange to refine cover crop technology for vineyards and orchards.
- G2.4. Maintain access roads and farm roads to control storm water runoff in agricultural areas. Utilize assistance from the U.S. Department of Agriculture (USDA) Natural Resource Conservation Service, or other erosion control professionals, for design of storm water runoff control on rural roads.
- G.2.5. Minimize wet weather vehicle traffic through or across agricultural areas, especially on hillsides.
- G.2.6. Provide adequate energy dissipaters for culverts and other drainage pipe outlets.
- G.2.7. Establish vegetated buffer strips along waterways.

4.5.3 IMPACTS ANALYSIS

4.5.3-1 SIGNIFICANCE CRITERIA

The Proposed Project would involve earthmoving activities associated with the development of vineyard areas, erosion control measures, and other features included within the ECP. For the purposes of this EIR, the Proposed Project would have a significant impact if it would:

- Result in the accelerated, long-term erosion and loss of topsoil causing substantial depletion of the agricultural resource or an increase in the rate and quantity of sediment accumulated down slope to the extent that it damages roads, vineyard facilities, adjoining vineyards, or deposits excessive sediment in natural waterways, including the two unnamed tributaries that flow down into the Napa River.
- Alter the topographic or geologic site conditions such that an earthquake would cause substantial damage to the proposed vineyard, or a geologic unit or soil would become unstable, thereby resulting in excessive erosion, soil creep, catastrophic slope and ground failure, or loss of cultivatable land area.

4.5.3-2 IMPACTS AND MITIGATION MEASURES

Impact 4.5-1: Development of the Proposed Project would alter the rate of sediment erosion and yield onsite. This is a potentially significant impact. However upon implementation of the erosion control methods and stream setbacks detailed in the ECP, the timber harvest, vineyard conversion, and road segment improvements would all be designed to create a decrease in sediment erosion and yield that would result in a less-than-significant impact to onsite and offsite receiving waters**.**

The conversion of existing habitats on the property to vineyard would result in the removal of 14± acres of trees and subsequent conversion of 12± acres to vineyard within the harvested area. Three acres within the harvested area would be utilized for access of farm trucks, equipment turn around, and vineyard maintenance operations. The timber harvest and vineyard conversion would result in the removal of existing trees, as well as soil ripping, earthmoving and grading activities. Vegetation clearing would remove obstacles to sediment transport while exposing more soils to erosion. However, an impact from the conversion of existing vegetation to vineyard areas would be considered significant if sediment erosion and yield are substantial to the extent that damage occurs to roads, vineyard facilities, or adjoining vineyards, or if sedimentation in receiving waters is significant.

The mainstem Napa River is listed as sediment-impaired according to the Clean Water Act, Section 303 (d), because it does not meet the beneficial uses for which is was designated, including steelhead habitat. Section 303 (d) requires the Regional Water Quality Control Board (RWQCB) to create a Total Maximum Daily Load (TMDL) for sediment in the Napa River watershed. Under California Water Code §13242, the RWQCB is also authorized to develop an implementation program to meet the TMDL. The RWQCB Staff Report for the development of the TMDL specifically cites vineyards as a source of human caused sediment discharge, and states that a total 50 percent reduction in sediment loading to the

watershed is necessary in order to meet the TMDL (Napolitano et al., 2007). The TMDL load reductions are based on natural conditions prior to human activities.

In order to meet the TMDL standard, it is County Policy (Napa General Plan Policy Con-48) that there should be no change in erosion ("maintain pre-development sediment erosion conditions") or, alternatively, that the project complies with State Water Quality requirements (**Section 4.5.2**). With the proposed sediment control features detailed in the ECP, sediment erosion on the property will be reduced by roughly 80 to 85 percent under the Proposed Project (OEI, 2011a; OEI, 2011b). In addition, virtually all sediment delivery to the streams is expected to be in the silt-clay size fraction, with sand sized sediment retained on-site. Sand has been identified as a key impact to streambed permeability in the Napa River; streambed permeability, or the flow rate of water through the streambed, is a key factor influencing the survival of incubating salmonid eggs and larvae (Napolitano, 2007).

As stated in the Erosion and Sediment Delivery Analysis report for the property (OEI, 2011a), the Universal Soil Loss Equation, Special Applications for Napa County, CA (USLE) was used to estimate sediment detachment and erosion potential for the Proposed Project. USLE erosion rate estimates do not account for deposition of eroded material on slopes in positions that remain stable and are not delivered to the channel system by runoff processes. Therefore, the estimation of sediment delivery rate (SDR) appropriate to the Proposed Project is critical in order to create an accurate evaluation of any potential erosion effects on water quality (OEI, 2011a). SDR is estimated using field observations, literature review, and professional judgment (OEI, 2011a).

The total vineyard field erosion predicted by USLE is about 20.0 tons per year [about 1.4 tons/acre/year (t/ac/yr)] (OEI, 2011a). Since half of the proposed vineyard is located greater than 200 feet from stream channels and these areas are not expected to deliver sediment to the onsite streams, the estimated area for half of the proposed vineyard (6± acres) is predicted by USLE to be (without any erosion control) about 9.5 tons of potential sediment per year. This represents an average potential erosion rate of about 1.2 t/ac/yr (OEI, 2001a).

The high clay and silt content of the Aiken Loam series (about 65 percent in the upper eight inches of the soil profile), does limit the potential effectiveness of the detention ditches and sediment basins, but the additional reduction of potential sediment delivery to streams from the Proposed Project is accomplished by discharging sheet flow (via level spreaders away from the perimeter of the vineyard fields) onto forested slopes that will help minimize the concentration of the runoff while maximizing the distance of runoff from the channels. As forested soils have high infiltration capacity and groundcover, this will effectively dissipate runoff and minimize sediment delivery of silts and clays. Sand sized sediment would remain on site, but some silts and clays would not be retained.

As noted above, the Proposed Project's SDR (pre-erosion control measures) is estimated by USLE to generate about 9.5 tons of sediment per year. Using GIS, OEI estimated that the total area within 200 feet of the streams is approximately 5.18 acres (**Table 4.5-2).** Using the USLE erosion rate and SDRs described above, the pre-project sediment delivery rate was calculated to be approximately 0.6 tons per year (OEI, 2011a).

With erosion control practices in place, OEI estimated the potential sediment delivery post-project from within 200 feet of the watercourses to be 1.50 tons per year (**Table 4.5-3**). As estimated sediment delivery from the property (within 200 feet of the streams) pre-project is about 0.6 tons per year, the net change of sediment delivery to streams from the project area is about 0.9 tons per year. The combination of erosion control and runoff management practices should reduce expected potential sediment delivery from the Proposed Project to streams and watercourses by 84 percent (1.5 tons compared to 9.5 tons).

TABLE 4.5-2
PRE-PROJECT ESTIMATED SEDIMENT DELIVERY FROM AREAS WITHIN 200 FEET OF STREAMS AND WITHIN BOUNDARIES OF PROPOSED VINEYARD BLOCKS

Block	Area (ac)	USLE erosion rate (t/ac/yr)	Rate of erosion (t/yr)	Sed. Delivery Ratio (SDR)	Sed. Delivery (t/yr)
A	1.00	0.11	0.11	0.65	0.072
B	0.29	0.16	0.05	0.65	0.033
E	0.64	0.18	0.11	0.65	0.072
G	0.72	0.19	0.14	0.65	0.091
H	1.40	0.19	0.27	0.65	0.176
I1	0.62	0.20	0.13	0.65	0.084
I2	0.48	0.14	0.07	0.65	0.046
J	0.04	0.13	0.01	0.65	0.007
Total	**5.18**		**0.89**		**0.58**

Adapted from NVVE, 2010; Adapted from OEI, 2011c; AES, 2011

TABLE 4.5-3
POST-PROJECT SEDIMENT DELIVERY RATES

Runoff Delivery Location	Erosion (t/yr)	Est. grain size retained (mm)	SDR	Sediment Delivery (t/yr)
Within 200 ft of stream channel and not captured by detention basin	1.04	> 0.1 mm (sand)	0.65	0.68
Hillslope greater than 200 ft from stream channel, no delivery expected	7.00	All	0	0
Basin A (routed to hillslope ~ 150 ft from stream)	1.58	.02-.05 (sand & coarse silt)	0.1	0.16
Basin B (routed to hillslope > 200 ft from stream)	3.52	.02-.05 (sand & coarse silt)	0	0

Basin G (routed to hillslope > 200 ft from stream)	4.42	.02-.05 (sand & coarse silt)	0	0
Basin H (routed to hillslope ~ 25 ft from stream)	1.32	.02-.05 (sand & coarse silt)	0.5	0.66
Total	**18.9**			**1.5**

Adapted from OEI, 2011c; AES, 2011

Presently, the existing onsite road is a significant source of sediment. Although the road is considered outside of the development footprint, it is included in this analysis (and in the ECP) due to its contribution to the Proposed Project's sediment load. As described above, the existing road is located in the north and central areas of the property. The northern portion of the road crosses over the northwest Class III stream onsite, where the drainage is diverted beneath the road via a culvert. The road then bends to the southwest around proposed vineyard block E; however, this portion of the road remains outside of the 35 foot stream buffer. OEI (2011b) included this segment in their analysis because drainage on the road routes water along the road surfaces and ditches to the Class III stream located to the west. Existing sediment erosion rates for the onsite road were estimated by OEI (2011b) using a standard erosion calculation (Napolitano, 2006) and were calculated to be about 7.7 tons.

To mitigate this sediment load in the ECP, treatment to the project's existing road to limit erosion includes: the treatment of existing cut-slopes to reduce rain-splash erosion through vegetation, erosion control fabrics, rock retaining walls to create 80 percent cover, and the installation of base rock on the road bed to a depth of at least 0.5 feet (OEI, 2011b). By utilizing the proposed treatments, erosion would be significantly reduce by about 80 percent based on methods described in Washington DNR Watershed Analysis Manual (1997) (OEI, 2011b; Washington Forest Practice Board, 2011). Based on these methods, the resulting sediment savings would be about 6.2 tons per year (0.8 x 7.7). This amount of savings offsets the Proposed Project's estimated sediment loading significantly. As noted above, the sediment delivery for the Proposed Project conditions is 0.9 tons per year; by enacting sediment mitigation to the onsite road, this results in a net reduction in sediment delivery of about 5.3 tons per year.

The requirements of Napa County's Conservation Regulations (Chapter 18.108) are specifically listed as an effective measure at reducing sediment delivery. The Proposed Project complies with Policy Con-48 because it complies with the Basin Plan requirements with respect to estimated erosion rates. The project ECP and USLE calculations prepared by Napa Valley Vineyard Engineering for the ECP demonstrate that the project would limit potential erosion below the USDA soil erosion tolerance (T) of three t/ac/yr. The use of erosion control measures including sedimentation basins, rerouting runoff to forested areas, the use of level spreaders, straw mulch to cover portions of the vineyard that would deliver

sediments to stream, and appropriately designated County setbacks from the onsite spring and channels would provide supplementary treatment of all runoff from the Proposed Project that would be delivered to streams. For the portion of the proposed vineyard believed to deliver sediment to streams (6± acres), the sediment delivery rate is about 0.19 t/ac/yr**,** equivalent to about 6.5 percent of T (OEI, 2011a). The use of the erosion control measures described above represents the best way of minimizing sediment delivery to streams from the Proposed Project and eliminating sand from leaving the property. As sand is identified in the Napa River Sediment TMDL as a primary concern due to potential impacts on beneficial uses, with implementation of the erosion control measures in the ECP, the Proposed Project would have a less than significant impact on the surrounding watershed.

With incorporation of erosion and runoff control measures proposed in the ECP and discussed above, the overall load of sediment transported to local waterways with implementation of the Proposed Project is anticipated to be a significant reduction from pre-project conditions.

Mitigation Measure 4.5-1: No further mitigation is required.

Impact 4.5-2: Development of the Proposed Project would involve earthmoving and grading activities that would alter the existing topographic and geologic conditions at the property; however, conditions would not be altered such that significant damage to the property from excessive erosion, soil creep, catastrophic slope, or ground failure would occur nor would such hazards be likely to occur in the event of an earthquake. This is a less than significant impact.

The proposed vineyard could be subject to an earthquake event from one of the active faults within the San Andreas Fault zone. Numerous earthquakes with large magnitudes have occurred in the Bay Area over the last few centuries, and the USGS estimates that an earthquake of magnitude 6.0 or greater will likely occur in the Bay Area in the future. However, surface fault rupture would not be anticipated to occur at the property, since none of the active faults in Napa County that the CGS determined capable of underground surface fault rupture are located at or near the property. The Proposed Project includes the conversion of natural hillslope and forested areas into vineyard and road re-surfacing. Construction of the Proposed Project would involve earthmoving activities, soil cultivation, installation and maintenance of drainage and erosion control features, and vineyard plantings. Modifications that would alter the geologic setting of the property would be relatively minor changes associated with earthmoving activities for development of vineyards and associated avenues. Since the Proposed Project would not include construction of buildings or other facilities that would attract a large number of people, the potential risk of exposing people or structures to hazards from a seismic event is nonexistent. One water storage tank exists on the property; the occurrence of seismic shaking sufficient to damage

the structural integrity of the tank causing rupture is low, and any flooding or erosion caused by this release would be temporary. Additionally, this water tank would be upgraded under the Proposed Project and any improvements would be designed to meet County standards (refer to **Section 3.0**).

Ground failures due to seismically-induced ground shaking can reactivate dormant landslides, cause new landslides, accelerate or aggravate movement on active slides, as well as result in differential settlement, lateral spreading, and liquefaction. Seismically-induced ground shaking potential is low on the property; therefore, the potential to reactivate or cause new slides is low (ABAG, 2011). As discussed in **Section 4.5.1-4** above, based on the observation of no landsides located within the property, soil types and depth to bedrock, the project area's susceptibility to liquefaction is considered low. Lateral spreading is unlikely to occur because there are no liquefiable slopes on the property. Additionally, there are no observed slides in the property. Therefore, seismically induced ground failure as a result of the Proposed Project would be a less than significant impact.

Mitigation Measure 4.5-2: No further mitigation is required.

REFERENCES

Association of Bay Area Governments (ABAG), 2011. Seismic Hazards Mapping. Interactive GIS maps. Available online at: http://quake.abag.ca.gov/liquefac/liquefac.html. Accessed on October 6, 2011.

Dwyer, M. J., Nogushi, N. and O'Rouke, J., 1976. Reconnaissance Photo-interpetation Map of Landslides in 24 Selected 7.5 Minute Quadrangles in Lake, Napa, Solano, and Sonoma Counties, California. U.S. Geological Survey Open File Report 76-74, St. Helena Quadrangle, scale 1:24,000.

Fox, KT., Sims, J.D., Bartow, J.A, and Helley, E.J., 1973. Preliminary Geologic map of the Eastern Sonoma County and Western Napa County, California. U.S. Geological Survey Miscellaneous Field Studies MF-483, scale 1:62500

Gilpin Geosciences (Gilpin), Inc., 2011. Engineering Geological and Geotechnical Evaluation Jasud Vineyard, APN 02-300-005, 2087 Diamond Mountain Road, Calistoga, California. Prepared for Jasud Mountain Vineyards, Napa County, California.

International Conference of Building Officials (ICBO), 1988. Maps of Known Active Fault Near-source Zones in California and Adjacent Portions of Nevada. Prepared by California Devision of Conservation Divison of Mines and Geology, p. 19, with maps.

Napa County RCD, 1997. Napa River Watershed Owner's Manual. 5th Printing. Napa County Resources Conservation District, Napa, CA. Available online at http://www.naparcd.org/lib_officeresource.html. Accessed on October 6, 2011

Napa County Conservation, Development, and Planning Department (NCCDPD), 2005. Napa County Baseline Data Report. Napa County, California.

Napa County, 2008. Napa County General Plan. June 3, 2008. Available online at: http://www.countyofnapa.org/Policy/. Accessed on October 5, 2011.

Napa Valley Vineyard Engineering, Inc. (NVVE), 2011. Erosion Control Plan for the Jasud Estate Vineyard.

Napolitano, M., 2006. Methods for Estimating Rates and Sizes of Sediment Input to Channels and Spawning Gravel Permeability. San Francisco, San Francisco Bay Water Quality Control Board: 13.

Napolitano, M., Potter, S., and Whyte, D., 2007. Napa River Watershed Sediment TMDL and Habitat Enhancement Plan. San Francisco, San Francisco Bay Water Quality Control Board, San Francisco Bay Region.

O'Connor Environmental, Inc. (OEI), 2011a. Erosion and Sediment Delivery Analysis, Jasud Estate Vineyard. Prepared for Analytical Environmental Services. July, 2011.

OEI, 2011b. Jasud Estate Vineyard Eroision Mitigation Assessment Report. Prepared for Analytical Environmental Services. July, 2011.

USGS, 1963. Geology Map, Santa Rosa Sheet 1:250,000 scale.

U.S. Department of Agriculture (USDA), 1978. Soil Survey of Napa County, California. August 1978. Available online at: http://www.ca.nrcs.usda.gov/mlra02/napa/. Accessed on October 5, 2011.

U.S. Geologic Survey (USGS), 2003. Earthquake Probabilities in the San Francisco Bay Region, 2003 to 2032: A Summary Finding. The Working Group on California Earthquake Probabilities, U.S. Geological Survey.

Washington Forest Practices Board, 2011. Standard Methodology for Conducting Watershed Analysis, Version 5.0. Washington Department of Natural Resources, May, 2011.

4.6 GREENHOUSE GAS EMISSIONS

4.6.1 SETTING

It is anticipated that the average global temperature could rise 0.6 to 4.0 degrees (º) Celsius (C) (1.08 to 7.2 °Fahrenheit (F)) between the years 2000 and 2100 (IPCC, 2007). The extent to which human activities affect global climate change is a subject of considerable scientific debate. While many in the scientific community contend that global climate variation is a normal cyclical process that is not necessarily related to human activities, the Intergovernmental Panel on Climate Change (IPCC) report identifies anthropogenic greenhouse gases (GHGs) as a contributing factor to changes in the Earth's climate (IPCC, 2007).

The IPCC modeling estimates that anthropogenic carbon dioxide (CO_2) in the lower atmosphere has increased by approximately 31 percent since the year 1750. At the same time, average temperature in the lower atmosphere has increased approximately 0.6 to 0.8 °C (1.08 to 1.44 °F). Due to the challenges inherent in modeling the complexities of the Earth's climate, the proportional importance of anthropogenic activities as opposed to natural feedback systems is exceptionally difficult to establish. Nonetheless, the IPCC concludes that "Most of the observed increase in globally-averaged temperatures since the mid-20th century is very likely due to the observed increase in anthropogenic GHG concentrations." This EIR assumes that an increase in anthropogenic GHG concentration is in fact contributing to global warming, consistent with state policy.

IPCC theorizes that a continuation of this warming trend could have profound implications, including flooding, erratic weather patterns, and reduced arctic ice. The IPCC projects a number of future GHG emissions scenarios leading to a varying severity of impacts on the environment and the global economy. According to the 2007 IPCC report, if anthropogenic GHG continue to increase in the atmosphere there will be a point at which the above impacts would become irreversible, this point is commonly referred to as the "tipping point." Although the 2007 IPCC report states the tipping point may be as far off as 20 years, some experts contend the tipping point has already been reached.

Sources of GHG emission in the region include, on and off road vehicles, agriculture (cattle and farming), water and wastewater transport, indirect electricity use, solid waste disposal, loss of carbon sequestration in flora, and changes in land use.

4.6.2 REGULATORY FRAMEWORK

Climate change is a global phenomenon attributable to the sum of all human activities and natural processes. The Governor's Office of Planning and Research recommends quantification of GHG emissions, assessment of the significance of any impact on climate

change, and identification of mitigation or alternatives that would reduce GHG emissions. Climate change has the potential to reduce the snow packs in the Sierra Nevada Mountains, cause the sea level to rise, and increase the intensity of wildfires and storms.

The following regulatory background gives context to the issues of climate change and importance in reducing GHG emissions in California:

Assembly Bill 32

Signed by the California State Governor on September 27, 2006, Assembly Bill (AB) 32 codifies a key requirement of Executive Order (EO) S-3-05, specifically the requirement to reduce statewide GHG emissions to year 1990 levels by the year 2020. AB 32 tasks the California Air Resources Board (CARB) with monitoring state sources of GHGs and designing emission reduction measures to comply with the law's emission reduction requirements.

AB 32 required that CARB prepare a comprehensive "scoping plan" that identifies all strategies necessary to fully achieve the required 2020 emissions reductions. In early December 2008, CARB released its scoping plan to the public and on December 12, 2008, the CARB Board approved the scoping plan.

The scoping plan calls for an achievable reduction in California's carbon footprint. Reduction of GHGs emissions to 1990 levels are proposed, which equates to cutting approximately 30 percent from estimated GHG emission levels projected in 2020, or about 15 percent from today's levels. The scoping plan relies on existing technologies and improving energy efficiency to achieve the 30 percent reduction in GHG emission levels by 2020. The scoping plan provides the following key recommendations to reduce GHG emissions:

- Expand and strengthen existing energy efficiency programs as well as building and appliance standards;
- Achieve a statewide renewable energy mix of 33 percent;
- Develop a California cap-and-trade program that links with other Western Climate Initiative partner programs to create a regional market system;
- Establish targets for transportation-related GHG emissions for regions throughout California, and pursuing policies and incentives to achieve those targets; and
- Adopt and implement measures pursuant to existing State laws and policies, including California's clean car standards, goods movement measures, and the Low Carbon Fuel Standard.

Senate Bill 97

Signed by the Governor on August 24, 2007, Senate Bill (SB) 97 required that the Governor's Office of Planning and Research (OPR) prepare California Environmental Quality Act (CEQA) guidelines for evaluating the effects of GHG emissions and for mitigating such effects. The Natural Resources Agency adopted these guidelines on December 31, 2009.

In April 2009, OPR released the CEQA Guidelines Section Proposed to be Added or Amended, which included guidelines for evaluating the effects of GHG emissions and for mitigating such effects. On December 31, 2009, the Natural Resources Agency delivered its rulemaking package to the Office of Administrative Law for their review pursuant to the Administrative Procedure Act.

CEQA Guidelines

In accordance with SB 97, the Natural Resources Agency adopted Amendments to the CEQA Guidelines for GHGs on December 30, 2009. On February 16, 2010, the Office of Administrative Law approved the Amendments, and filed them with the Secretary of State for inclusion in the California Code of Regulations. The Amendments became effective on March 18, 2010. The amendments to the CEQA Guidelines provide the following direction for consideration of climate change impacts in a CEQA document:

- The determination of significance of GHG emissions calls for a careful judgment by the lead agency;
- A model or methodology shall be used to quantify GHG emissions resulting from a CEQA project;
- Significance may rely on qualitative analysis or performance based standards;
- The CEQA document shall discuss regional and/or local GHG reduction plans;
- A CEQA document shall analyze GHG emissions if they are cumulatively considerable;
- A description of the effects of climate change on the environment shall be included in CEQA documents;
- A CEQA document shall contain mitigation measures, which feasibly reduce GHG emissions;
- GHG analysis in a CEQA document may be Tiered or Streamlined; and
- Creating targeted fees, including a public goods charge on water use, fees on high global warming potential gases, and a fee to fund the administrative costs of the State's long term commitment to AB 32 implementation.

Senate Bill 375

SB 375 was approved by the Governor on September 30, 2008. SB 375 provides for the creation of a new regional planning document called a "sustainable communities strategy" (SCS). An SCS is a blueprint for regional transportation infrastructure and development that

is designed to reduce GHG emission from cars and light trucks to target levels that will be set by CARB for 18 regions throughout California. Each of the various metropolitan planning organizations and the Association of Bay Area Governments (ABAG) must prepare an SCS and include it in that region's regional transportation plan. The SCS would influence transportation, housing, and land use planning. CARB will determine whether the SCS will achieve the region's GHG emissions reduction goals. Under SB 375 certain qualifying in-fill residential and mixed-use projects would be eligible for streamlined CEQA review.

Bay Area Air Quality Management District Climate Change Guidelines

Napa County is a part of the Bay Area Air Quality Management District (BAAQMD). The 2010 BAAQMD CEQA Guidelines provide extensive guidance for accessing climate change impacts at the project level. The Guidelines provide a significance threshold, as well as a methodologies and model for estimating project-related GHG emissions. The 2010 Guidelines provide mitigation measures, which would reduce project-related emissions to less-than-significant levels and provides a methodology to quantify GHG emissions reduction from each mitigation measure.

The climate change analysis is consistent with the guidance provided to-date by OPR and CARB. As directed by the OPR Technical Advisory, this analysis considers whether project emissions are individually or cumulatively significant. For the Proposed Project's GHG emissions, it was determined that specific climate change impacts could not be attributed to the proposed development. As such, project impacts are most appropriately addressed in terms of the incremental contribution to a global cumulative impact (see **Section 6.0**). This approach is consistent with the view articulated in the following quote provided in the IPCC, "difficulties remain in attributing temperature on smaller than continental scales and over time scales of less than 50 years. Attribution at these scales, with limited exceptions, has not yet been established" (IPCC, 2007).

Napa County

Since the certification of the Final General Plan EIR and adoption of the General Plan, Napa County has undertaken numerous efforts aimed at reducing GHG emissions. The County participated in a multi-jurisdictional effort lead by the Napa County Transportation and Planning Agency (NCTPA) to quantify community-wide emissions for all jurisdictions within the County and to develop a non-binding emission reduction framework (2009) that each jurisdiction can use to guide their decision making and planning.

The County has also prepared and adopted an emission reduction plan aimed at reducing emissions from County operations. The County is currently in the process of preparing a Climate Action Plan (CAP) specific to unincorporated areas of the County. The CAP is being developed to meet qualifications established by CARB. The CAP will include a refined inventory and forecast of GHG emissions for unincorporated Napa County, including

emissions associated with agriculture and changes in carbon sequestration over time. The CAP will quantify emissions from vineyard development and operations (as well as other sectors), and will include emission reduction measures aimed at achieving goals of AB 32. A draft CAP was completed in January 2011 and is anticipated to be adopted in late 2011. The draft CAP includes a 52 percent reduction in GHG emissions from "business as usual" practices. While the draft CAP represents a guiding framework for this analysis, since the draft CAP has not yet been adopted by the County, State goals are used in this analysis as the basis for determining less than significant impacts during project construction (see **Section 4.6.3-1** below).

4.6.3 IMPACTS ANALYSIS

4.6.3-1 SIGNIFICANCE CRITERIA

In June 2010, the BAAQMD Board of Directors adopted the proposed BAAQMD CEQA Guidelines. In accordance with BAAQMD CEQA Guidelines (Guidelines), a project can be determined to have a less than significant impact by providing either project components or mitigation, which would reduce GHG emissions below a specific threshold defined by a public agency or recommended by experts provided that the decision of the lead agency to adopt such thresholds is supported by substantial evidence. The Guidelines included an operational threshold of 1,100 metric tons per year of CO_2 equivalent (CO_2e) and a methodology for calculating project-level GHG emissions.

CO_2e is a method by which GHGs other than CO_2 are converted to a CO_2-like emission value based on a heat-capturing ratio or global warming potential (GWP). CO_2 is used as the base and is given a value of one. Methane (CH_4) has the ability to capture 21 times more heat than CO_2; therefore, CH_4 is given a CO_2e value of 21. GHG emissions are multiplied by the CO_2e value to achieve one GHG emission value. By providing a common measurement, CO_2e provides a means for presenting the relative overall effectiveness of emission reduction measures for various GHGs in reducing project contributions to global climate change.

Although the Guidelines provide clear guidance on how to analyze GHG emissions from biogenic sources, which result from natural biological processes such as the decomposition or combustion of vegetative matter (wood, paper, vegetable oils, animal fat, yard waste, etc.), the Guidelines do not require the quantification of biogenic emissions as part of the quantification of GHG emissions for projects and does not provide a GHG emission threshold for these sources for both operation and construction activities. However, the Guidelines do recommend that construction-related GHG emissions be quantified using the URBEMIS air quality program and disclosed in the appropriate environmental document.

The Guidelines require that only exhaust from construction equipment be included in the climate change analysis, similar to the analysis for criteria pollutants.

For this analysis, a reduction of approximately 25 percent from "business as usual" levels of GHG emissions, which is consistent with recent court decisions and the language of AB 32, will be deemed to be an appropriate means for meeting the State's GHG reduction goals (*Citizens for Responsible Equitable Environmental Development v. City of Chula Vista*, (July 8, 2011, D057779)). Therefore, for this analysis, such a reduction in GHG emissions will be considered as a less than significant impact to climate change. This significance threshold is consistent with the State of California and AB 32 GHG Reduction Goals. As stated above, since the County has not yet adopted any further reduction criteria, the State goals are used in this analysis as the basis for determining less than significant impacts during project construction. The BAAQMD standards of 1,100 MT per year or less shall be the basis for determining project operational significance.

4.6.3-2 IMPACTS AND MITIGATION MEASURES

Impact 4.6-1: Construction of the Proposed Project would emit GHGs and would have the potential to exacerbate global climate change. Project sources of GHG emissions during construction would include the transport and delivery of construction equipment to the property; operation of construction equipment, including equipment used for the timber harvest, planting the vineyard, and installing the erosion control system; worker trips, fuel use, and material transport. This is a potentially significant impact; however, after mitigation, impacts would be considered less than significant.

Methodology
GHG emissions from construction equipment were estimated using the URBEMIS 9.2.4 air quality model. URBEMIS default construction equipment values were used. Typical equipment to be used during the timber harvest and installation of the vineyard and erosion control measures include excavators, crawler tractors, and graders. A complete description of the equipment to be used during construction of the Proposed Project is found in **Section 3.0 Project Description**. Where a precise equipment match with the URBEMIS model equipment categories was not found, a similarly rated piece of equipment from the standard URBEMIS default list was used. Direct GHG emissions from the removal of trees on the property were determined using EPA emissions factors (EPA, 2011). CO_2e emissions from the tilling and ground clearing process during construction were estimated using guidance from the 2006 Effects of Land Use on Soil Respiration: Conversion of Oak Woodlands to Vineyards (Carlisle, 2006).

Findings
Table 4.6-1 shows the estimated project construction emissions of GHG from construction activities including mobile and indirect sources as well as the GHG emissions from biogenic

sources. Construction GHG emissions would be reduced with the milling and conversion of removed trees to lumber onsite. As part of the Proposed Project's design, milling the harvested trees onsite and eliminating the use of logging trucks reduces the project's GHG emissions impacts in comparison to standard timber harvesting operations by roughly 50 percent. This is due to the high number of trips associated with logging trucks under typical "business as usual" timber harvesting practices. In addition, while the entire 38-acre property is eligible for selective timber harvest, the Proposed Project design limits the timber harvest area to 14± acres and thereby conserves roughly 20 acres of the forested area remaining on the property, which will continue to be a large source for carbon sequestration on the property. Moreover, once the vineyard is established and the cover crop is applied, these areas will occupy roughly 12± acres of the 14-acre harvest and will therefore function as an additional source of carbon sequestration on the property. **Quantification of these last two sources of carbon sequestration is hard to quantify and therefore was not included as a reduction in this analysis. Therefore, the URBEMIS model output reflects conservative estimates in terms of carbon sequestration.**

TABLE 4.6-1
GREENHOUSE GAS CONSTRUCTION EMISSIONS

Proposed Project	GHGs	Emissions	Conversion Factor	GHG Emissions
		ST	ST/MT	MT of CO_2e
Construction GHG Emissions				
Mobile Construction Activities[1]	CO_2e	476	0.91	433
Timber Removal[2]	CO_2e			3,600
Soil Tilling/Ground Clearing[3]	CO_2e			492
Subtotal				**4,525**
Harvested Timber to Lumber	CO_2e			<2,584>
Total Construction GHG Emissions				**1,941**

ST = short tons; MT = metric tons; CO_2e = carbon dioxide equivalent
[1] Estimated using BAAQMD recommended URBEMIS air quality model and includes land clearing, roadway construction, irrigation system installation, planting, etc.
[2] Actual harvesting of standing carbon from the trees that will be cleared for vineyard construction. Timber Removal is based on 2.4 MT per acre, 14 acres cleared (EPA, 2011).
[3] Carbon loss from tilling and ground disturbing activities based on 12 acres tilled, 41 MT of carbon stored per acre.
Source: URBEMIS, 2007; AES, 2011.

Construction GHG emissions would be further reduced with the implementation of the BAAQMD construction emission reduction measures outlined in Mitigation Measure 4.6-1 (below); however, these reductions are difficult to accurately quantify due to limited scientific research available related to the measure. **Therefore, reductions from Mitigation Measure 4.6-1 are not included in this analysis, which results in a more conservative estimate of construction GHG emissions** (**Table 4.6-1**).

As shown in **Table 4.6-1**, GHG emissions from construction activities, including removal of vegetation and carbon emitted due to tillage would result in 4,525 MT of CO_2e. Further, the Proposed Project's design would retain 2,584 MT of CO_2e or 57 percent of the project's GHG emissions in the form of lumber (**Table 4.6-1**). The total construction GHG emissions from the Proposed Project would be 1,941 MT of CO_2e. Therefore, the Proposed Project's design reduces GHG emissions from construction by 57 percent from "business as usual" practices, which results in a less than significant impact to climate change. Since the County's draft Climate Action Plan (CAP) provides for a reduction in GHG emissions by 52 percent, the Proposed Project meets the draft CAP standard. As stated in **Section 4.6.2**, while the draft CAP represents a guiding framework for this analysis and since the draft CAP has not yet been adopted by the County, State goals are used in this analysis as the basis for determining less than significant impacts during project construction. The Applicant would further reduce construction-related GHG emissions from the Proposed Project with implementation of **Mitigation Measure 4.6-1**. Moreover, since construction is to be completed over two years, the average annual construction emissions would be less than the BAAQMD operational levels of significance of 1,100 MT of CO_2e per year.

Mitigation Measure 4.6-1: The Applicant shall implement the following mitigation measures to reduce criteria pollutant emissions during construction of the Proposed Project:

- The Applicant shall maintain all construction equipment in accordance with manufacturers' specifications.
- The Applicant shall limit construction equipment idling time to less than five minutes.

Impact 4.6-2: Operation of the Proposed Project would emit GHGs and would have the potential to exacerbate global climate change. Project operational sources of GHG emissions would include vehicles (produce and material transports and workers) traveling to and from the Proposed Project, energy use, and limited water transport. Impacts would be considered less than significant.

Methodology

Operational GHG emissions from mobile and area sources were estimated using URBEMIS 9.4.2 air quality model. Mobile sources include worker trips and transport of grapes and materials. Indirect GHG emissions from water conveyance and agriculture were estimated using the 2011, beta version of the BAAQMD GHG Model (BAAQMD, 2011). The average annual loss of carbon sequestration was estimated from EPA approved emissions factors (EPA, 2011). GHG emissions from mobile and area sources were converted to CO_2e and compared to appropriate climate change thresholds.

Findings

Under the BAAQMD CEQA Guidelines, a project's operational emissions must be quantified. **Table 4.6-2** shows the estimated project-related GHG emission from direct and indirect emission sources.

TABLE 4.6-2
GREENHOUSE GAS OPERATIONAL EMISSIONS

Proposed Project	GHGs	GHG Emissions (MT/yr of CO_2e)
Direct Operational GHG Emissions		
Loss of Sequestration[1]	CO_2e	39
Area	CO_2	1
Indirect Operational GHG Emissions		
Mobile	CO_2	158
Agricultural		16
Water and Wastewater[2]	CO_2e	5
Total Annual Operational GHG Emissions		**219**
BAAQMD Operational GHG Emissions Threshold		*1,100*
Significant		***No***

ST = short tons; MT = metric tons; CO_2e = carbon dioxide equivalent
[1] Actual loss of carbon sequestration due to the permanent removal of timber on-site.
[2] Based on 8 acre-feet of water use per year (refer to **Appendix B**).
Source: URBEMIS, 2007; BAAQMD, 2011; EPA, 2011.

Agricultural lands depend on water for irrigation and this water must be provided either from wells, lakes or streams. The movement of water can be energy intensive. In California, the movement of water constitutes 14 percent of the state's total energy usage due largely to factors such as distance moved, major state and federal water projects, and depth to ground water in some areas. The use of gas or diesel powered pumps to extract water from the ground or move water from lakes or streams for various land uses increases GHG emissions. However, the Proposed Project does not exhibit these factors since the proposed water use would be from an existing onsite spring, which is not pumped for extraction, and the distance water would be moved from the existing storage tank to the proposed vineyard is relatively small. Likewise, irrigation water is only anticipated to be used during the establishment of the vines and the vineyard would be dry farmed once established. Thus, the Proposed Project would make efficient use of water from existing water sources to the degree needed to establish the vineyard. This would reduce the energy needed to transport water and therefore reduce GHG emissions. **Thus, the GHG emissions impacts for water and wastewater shown in Table 4.6-2 constitute a standard estimate that is largely conservative and does not take into account these project specific factors.**

Benefits of the Proposed Project's Design

There are several other beneficial aspects of the Proposed Project's design that would reduce impacts to climate change. Construction equipment would be kept onsite during construction (which would minimize truck trips), engine idling would be minimized, equipment would be properly maintained, and a cover crop would be established on all disturbed areas. These project components, which would reduce GHG emissions, are not readily quantifiable due to the lack of verifiable scientific data, therefore, a conservative approach was taken in this analysis and the GHG emissions reductions due to these specific project components were not included in the analysis. Therefore, the GHG emissions impacts identified in **Table 4.6-2** are conservative estimates.

As shown in **Table 4.6-2**, operational GHG emissions would be less than the BAAQMD CEQA threshold of 1,100 MT of CO_2e for project-level operation; therefore, operation of the Proposed Project would result in a less than significant impact to climate change.

Mitigation Measure 4.6-2: No mitigation is required.

REFERENCES

Bay Area Air Quality Management District Greenhouse Gas Model (BGM), 2011. GHG Modeling tool, which estimates emissions from stationary and mobile source, 2011 beta version. Available online at: http://www.baaqmd.gov/Divisions/Planning-and-Research/CEQA-GUIDELINES/Urbemis-and-BGM-Training-Videos.aspx. Used on August 18, 2011.

Carlisle, Eli A., Kerri L. Steenwerth, and David R. Smart 2006. Effects of Land Use on Soil Respiration: Conversion of Oak Woodlands to Vineyards. J. Environ. Qual. 35:1396-1404 (2006).

Citizens for Responsible Equitable Environmental Development v. City of Chula Vista, (July 8, 2011, D057779)).

Intergovernmental Panel on Climate Change (IPCC), 2007. Fourth Assessment Report: Climate Change 2007. Available online at: http://www.ipcc.ch/publications_and_data/ar4/syr/en/contents.html. Accessed August 17, 2011.

Urban Emissions Model (URBEMIS), 2007. Air quality modeling program. Available online at: http://www.urbemis.com/. Used on October 17, 2011.

U.S. Environmental Protection Agency (EPA), 2011. Representative Carbon Sequestration Rates and Saturation Periods for Key Agricultural & Forestry Practices. Available online at: http://www.epa.gov/sequestration/rates.html. Accessed on August 23, 2011.

4.7 HAZARDOUS MATERIALS

This section only addresses hazardous materials (not hazards); hazards associated with a school or public airport would not apply to the Proposed Project, as the property is located approximately 2.2 miles from the nearest school and approximately 7.6 miles from the nearest airport. The Proposed Project would also not interfere with an adopted emergency response plan or emergency evacuation plan and would not expose people or structures to a significant risk of loss, injury or death involving wildland fires.

4.7.1 SETTING

4.7.1-1 CURRENT SITE CONDITIONS

Database Searches

Regulatory agency databases were searched in an effort to identify locations of current and historical hazardous materials storage, generation, and release. It should be noted that a site could be listed on a hazardous materials database and be in compliance with local, state and federal laws. The database search did not identify any hazardous sites on the property. No leaking underground storage tanks (LUSTs) sites are located within one mile of the property (Geo Tracker, 2011). The closest site is the Vitkovsky Property (T0605500169) located at 415 Foothill Blvd, approximately 1.8 miles away, across State Route 29. This site was opened September 5, 1990 for cleanup of soil contaminated with gasoline (GeoTracker, 2011). The property is not listed on the LUST database or the State CORTESE list and no hazardous releases have been reported within 1,500 feet of the project parcel (Napa County GIS, 2003).

4.7.1-2 PROPOSED VINEYARD OPERATIONS

The proposed vineyards would be certified Biodynamic by Demeter, USA and managed using a systems approach in order to minimize the impacts of disease and pest management on the surrounding ecosystem. Integrated Pest Management (IPM) techniques will be employed and materials which have the least environmental impact will be used. IPM employs an aggressive visual monitoring regime to identify the presence of invasive insects prior to infestation. This sustainable farming approach entails utilizing non chemical and minimalist chemical practices. In the event that a situation arises where a more intrusive material or technique is required, all other non chemical avenues will first be exhausted. Required chemicals will be chosen based on minimal environmental toxicity and will be used at the lowest rate possible in order to minimize non-targeted contamination and drift. The Proposed Project would only use materials certified through the Organic Materials Review Institute (OMRI) and any excess materials would be disposed of in compliance with federal, state, and local regulations. A Pest Control Advisor (PCA) will be contracted to help

mitigate unanticipated changes to ensure the least environmental impact.

No permanent storage of fertilization or pesticide materials would occur at the Proposed Project site. In the event fertilizer or pesticide is used, application equipment would be washed in an area free from runoff hazards and containment mechanisms and controls will be used where appropriate. Non-biodegradable residual materials and wastes will be handled and transported offsite in closed containers in accordance with local, State, and Federal regulations. Any biomass accumulation resulting from vineyard operation would be chopped/chipped in the vineyard and either be used as mulch immediately adjacent to the vineyard or retained between the vine rows in swards (Mody, 2011).

4.7.2 REGULATORY FRAMEWORK

4.7.2-1 FEDERAL

The Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) governs the sale, distribution and use of pesticides in the United States (EPA, 2010a). Pesticides are regulated under FIFRA until they are disposed, at which time they become wastes and are regulated under the Resource Conservation and Recovery Act (RCRA), which ensures responsible management of hazardous and nonhazardous waste (EPA, 2010b). Some, but not all, pesticides are regulated as hazardous waste when disposed. FIFRA was enacted in 1947, and significantly amended in 1972 and 1996, to provide federal control of pesticide distribution, sale, and use. FIFRA requires that each manufacturer register each pesticide and its label with the U.S. Environmental Protection Agency (EPA) before it can be manufactured for commercial use.

The Occupational Safety and Health Administration (OSHA) was created to ensure worker safety and health in the United States by working with employers and employees to create better working environments. Section 1919, Subpart H-Hazardous Materials of the Occupational Safety and Health Act of 1970 provides information and guidelines for working with hazardous materials (OSHA, 1970). All employees at the property will be trained in proper methods of working with hazardous materials.

The U.S Department of Transportation has the authority to regulate all safety aspects of hazardous materials transportation in accordance with the Hazardous Materials Transportation Act of 1975. The Motor Carrier Act of 1980 requires carriers of hazardous materials to demonstrate their ability to pay for damages sustained from an accident involving such materials by means of adequate insurance. The California Highway Patrol regulates transportation of hazardous materials in California. Fertilizers and petroleum fuel that are used on the property would be delivered onsite by licensed contracted delivery companies.

4.7.2-2 STATE

The California Department of Pesticide Regulation (DPR) protects human health and the environment by regulating pesticide sales and use and fostering reduced-risk pest management. Oversight by DPR includes product evaluation and registration, environmental monitoring, residue testing of fresh produce, and local use enforcement through county agricultural commissioners. DPR's regulations of pesticide use on the property would be regulated through the policies of the Napa County Agricultural Commissioner.

The Resources Conservation and Recovery Act (RCRA) of 1976 and the California Health and Safety Code authorize the California Department of Toxic Substance Control (DTSC) to regulate the handling, storage, transportation, and disposal of hazardous substances. DTSC regulations of hazardous materials use on the property would be followed through the local Certified Unified Program Agencies (CUPAs) as described below.

Senate Bill 1082 required the establishment of a unified hazardous waste and hazardous materials management program. The result was the California Environmental Protection Agency (CalEPA) Unified Program. The Unified Program consolidates, coordinates, and makes consistent the administrative requirements, permits, inspections, and enforcement activities of six environmental and emergency response programs. The state agencies responsible for these programs set the standards for their program, while local governments implement the standards. CalEPA oversees the implementation of the program as a whole (CalEPA, 2006). The Unified Program is implemented at the local level by 85 government agencies certified by the Secretary of CalEPA. These Certified Unified Public Agencies (CUPAs) have typically been established as a function of a local environmental health or fire department. The Proposed Project will comply with the Unified Program through the Napa County Department of Environmental Management (DEM).

To comply with Title 22 of the California Code of Regulations (CCR) (66262.34(f)), hazardous waste containers must be marked with specific information. This regulation applies to the Proposed Project because waste oil will be stored at the property.

A valid Hazardous Materials Transportation License is required by the laws and regulations of the State of California (Vehicle Code Section 32000.5) for the transportation of either:

- Hazardous materials shipments for which the display of placards is required; or
- Hazardous materials shipments of more than 500 pounds (being transported for a fee), which would require placards if shipped in greater amounts in the same manner.

All motor carriers and drivers involved in the transportation of hazardous materials must comply with the requirements contained in federal and state regulations, and must apply for

Risk Management Plan would need to be submitted. The hazardous materials used on the property are not listed on the Federal Regulated Substances List; therefore, the Proposed Project is not subject to the CalARP Program.

There are just under 500 facilities in Napa County permitted to generate hazardous waste. They range from large quantity generators (greater than 1,000 kilograms of hazardous waste per month), to small quantity generators (less than 1,000 kilograms of hazardous waste per month), to conditionally exempt small quantity generators (less than 100 kilograms of hazardous waste per month).

The Napa County Agricultural Commissioner and staff are responsible for the implementation of federal, state and local hazardous materials regulatory programs within Napa County. The Agricultural Commissioner is authorized to enforce the laws administered by the DPR. The Agricultural Commissioner requires a private applicator certificate for restricted materials (pesticides) use. To obtain a private applicator certificate an exam must be taken, which is administered through the Agricultural Commissioner. The private applicator certificate allows purchase and use of California restricted materials and the authority to perform required training of pesticide handlers and field workers. The certificate is valid for a three-year period and may be renewed through continuing education or by re-examination. Restricted materials permits are required for commercial use of certain pesticides and must be renewed annually. Pesticide use reports must be submitted to the Napa County Agricultural Commissioner on the 10th of the month following application.

Safety issues associated with transportation of hazardous substances are discussed in the Safety Element of the Napa County General Plan. The following safety and conservation policies are listed in the General Plan (Napa County, 2008):

- Policy SAF-5: The County shall cooperate with other local jurisdictions to develop intra-county evacuation routes to be used in the event of a disaster within Napa County.
- Policy SAF-30: Potential hazards resulting from the release of liquids (wine, water, petroleum products, etc.) from the possible rupture or collapse of aboveground tanks should be considered as part of the review and permitting of these projects.
- Policy SAF-31: All development projects proposed on sites that are suspected or known to be contaminated by hazardous materials and/or are identified in a hazardous material/waste search shall be reviewed, tested, and remediated for potential hazards.
- Policy CON-2 (e): Encourage inter-agency and inter-disciplinary cooperation, recognizing the agricultural commissioner's role as a liaison and the need to monitor and evaluate pesticide and herbicide programs over time and to potentially develop

air quality, wildlife habitat, or other programs if needed to prevent environmental degradation.

- Policy CON-2 (f): Minimize pesticide and herbicide use and encourage research and use on integrated pest control methods such as cultural practices, biological control, hose resistance and other factors.

4.7.3 IMPACTS ANALYSIS

The CEQA *Guidelines* list a series of threshold criteria to analyze hazardous materials impacts resulting from a project. This section considers only the criteria that involve use of hazardous materials, which are directly applicable to the project.

4.7.3-1 SIGNIFICANCE CRITERIA

For purposes of this analysis, an impact is considered significant if the Proposed Project would:

- Create a significant hazard to the public or the environment through routine transport, use or disposal of hazardous materials; or
- Create a significant hazard to the public or the environment through reasonable foreseeable upset and accident conditions involving release of hazardous materials into the environment.

4.7.3-2 IMPACTS AND MITIGATION MEASURES

Impact 4.7-1: There is potential for incidental leakage, rupture or spillage when fueling agricultural equipment during construction and operation of the Proposed Project, which could result in hazards to the public or environment. If substantial quantities of diesel or unleaded gasoline reach soil or drainage areas, surface and/or groundwater quality may be degraded. This is a potentially significant impact.

During construction and operation of the Proposed Project, the use of hazardous materials would include substances such as gasoline, diesel fuel, motor oil, and hydraulic fluid. Fueling and oiling of construction equipment would be performed as needed. The most likely possible hazardous materials releases would involve the dripping of fuels, oil, and grease from equipment. The small quantities of fuel, oil, and grease that may drip from properly maintained vehicles would occur in relatively low toxicity and concentration. No long-term effects to the soil or groundwater would occur. Typical construction management practices limit and often eliminate the effect of such accidental releases. An accident involving a service or refueling truck would present the worst-case scenario for the release of a hazardous substance. Depending on the relative hazard of the material, if a spill of

significant quantity were to occur, the accidental release could pose a hazard to construction employees, as well as to the environment. Such a release could result in a potentially significant impact. Potentially significant impacts during temporary construction activity can be mitigated to less than significant through the implementation of standard operating procedures (SOPs) intended to eliminate construction related pollutants from leaving the construction site. Specific project objectives associated with the implementation of the ECP under the Proposed Project are identified in **Section 3.0**. These measures as well as the SOPs described below will ensure potential impacts remain less than significant.

Mitigation Measure 4.7-1: In addition to the erosion control measures that are shown in **Figure 3-4c**, personnel shall follow written SOPs for filling and servicing construction equipment and vehicles. The SOPs, which are designed to reduce the potential for incidents involving hazardous materials, shall include:

- Refueling shall be conducted only with approved pumps, hoses, and nozzles.
- Catch-pans shall be placed under equipment to catch potential spills during servicing.
- All disconnected hoses shall be placed in containers to collect residual fuel from the hose.
- Vehicle engines shall be shut down during refueling.
- No smoking, open flames, or welding shall be allowed in refueling or service areas.
- Refueling and all construction work shall be performed outside of any onsite stream buffer zones to prevent contamination of water in the event of a leak or spill.
- Service trucks shall be provided with fire extinguishers and spill containment equipment, such as absorbents.
- A spill containment kit that is recommended by the DEM or local fire department will be onsite and available to staff if a spill occurs.

In the event that contaminated soil and/or groundwater or other hazardous materials are generated or encountered during construction, all work shall be halted in the affected area and the type and extent of the contamination shall be determined. Should a spill contaminate soil, the soil shall be put into containers and disposed of in accordance with federal, state, and local regulations. If containment and size of the spill is beyond the scope of the contractor, proper authorities shall be notified. The potential release of hazardous materials during construction of the Proposed Project is reduced to less than significant with the implementation of the mitigation measure above.

Impact 4.7-2: In the event IPM techniques (as described in **Section 3.4.3;** and above in **Section 4.7.1-2**) are found to be inadequate for vineyard maintenance, the Proposed Project would include the use of pesticides for vineyard maintenance. Non-compliance with

hazardous materials regulations including improper pesticide use, storage or disposal can be hazardous to human health and the environment. This is a potentially significant impact.

The proposed vineyard would be managed as Biodynamic, certified by Demeter, USA, and no pesticides or fertilizers will be used onsite. However, the Proposed Project may include the use of chemicals for vineyard maintenance in the event all other non-chemical methods were previously exhausted and found insufficient. If such a scenario were to occur, the owner would apply for a private applicator certificate and a restricted materials permit from the Napa County Agricultural Commissioner. The owner would also comply with the Napa County Agricultural Commissioner's regulations, such as renewing the private applicator certificate every three years and restricted materials permits annually, and reporting pesticides use to the Agricultural Commissioner by the 10th of every month following application. In addition, all vineyard employees would be trained annually in the proper use of pesticides.

Mitigation Measure 4.7-2: In the event pesticides are used onsite, personnel shall follow SOPs when applying pesticides to the vineyard. SOPs for pesticide use, shall include the following:

- Purchase only enough pesticide that would be used per season.
- Utilize IPM techniques where feasible, such as the use of a permanent cover crop, beneficial insects, and minimal to no use of pesticides except when found necessary from monitoring and for fungicides.
- All pesticides will be stored in their original containers. Labels on the containers will not be removed.
- Pesticides will be kept in a well-ventilated locked area.
- Pesticide storage areas will be 100 feet from any drainage area, stream, or groundwater well.
- The best way to dispose of a small amount of pesticide is to use it. If a pesticide must be disposed of, contact the Napa County Agricultural Commissioner to locate a hazardous waste facility for proper disposal.
- Pesticides will never be poured down the sink, toilet, or stream.
- Proper personal protection equipment will be utilized when working with pesticides.

Implementation of the mitigation measure above reduces potential impacts from pesticide use to less than significant.

Impact 4.7-3: The potential release of hazardous materials into the environment may affect on- or off-site surface water or groundwater during operation and maintenance of the vineyard. This is a potentially significant impact.

During operation of the vineyard under the Proposed Project, the use of hazardous materials would likely include substances such as gasoline, diesel fuel, motor oil, and limited pesticides and fertilizers to be used as a last resort (see **Impact 4.7-2**). Hazardous materials releases from operation and maintenance of the vineyard may occur from dripping of fuels, oil, grease, pesticides, and fertilizers from farm equipment. The small quantities of hazardous materials that may drip from properly maintained equipment would occur in relatively low toxicity and concentration. It is not likely that significant impacts to soil or groundwater would occur.

Napa County DEM promotes best management practices (BMPs) to reduce hazardous material contamination of surface and groundwater. The Proposed Project would be operated in a manner that is consistent with Napa County DEM requirements. As discussed in **Chapter 4.3 Biological Resources**, stream setbacks are proposed consistent with Napa County stream setback requirements and a 50-foot setback would be maintained around all wetlands identified near the spring and wet area onsite. No vineyard operation or maintenance activities would occur in the buffer zones. During storm events, the buffer zone would act as a filter to reduce the potential for petroleum products, pesticides, or fertilizers to reach drainages onsite or off-site waters of the U.S.

Mitigation Measure 4.7-3: In addition to **Mitigation Measures 4.7-1** and **4.7-2**, fuel loading and chemical mixing areas should be established outside the proposed setbacks and away from any areas that could potentially drain off-site or potentially affect surface and groundwater quality. When farm equipment is cleaned at the existing facility, only rinse water that is free of gasoline residues, pesticides and other chemicals, and waste oils should be allowed to diffuse back into vineyard areas. In the event pesticides, herbicides or fungicides are used, all rinse water from farm equipment and rinse water from application equipment used to apply chemicals should be collected and stored in containers that are of sufficient size to contain the water until a hazardous materials transporter can remove the rinse water. No rinse water shall be drained to a septic system or discharged to ground or surface water to prevent the release of hazardous materials into the environment during operation and maintenance of the Proposed Project. Impacts after mitigation would be less than significant.

REFERENCES

California Environmental Protection Agency (CalEPA), 2006. *The Unified Program.* California Environmental Protection Agency. Available online at: http://www.calepa.ca.gov/CUPA/. Accessed July, 2011.

California Highway Patrol (CHP), 2000. *How to obtain a Hazardous Materials Transportation License.* California Highway Patrol. May, 2000. Available online at: http://www.chp.ca.gov/publications/pdf/chp361e.pdf. Accessed July, 2011.

Federal Environmental Protection Agency (EPA), 2010a. Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA). United States Environmental Protection Agency. Available online at: http://www.epa.gov/agriculture/lfra.html. Accessed July, 2011.

EPA, 2010b. Summary of the Resource Conservation and Recovery Act. United States Environmental Protection Agency. Available online at: http://www.epa.gov/lawsregs/laws/rcra.html. Accessed July, 2011.

Geo Tracker, 2011. State Water Resources Control Board. Available online at: http://www.geotracker.swrcb.ca.gov/. Accessed July, 2011.

Mody, Ketan. 2011. *A Report of the Use of Sustainable Pest Management Practices for Jasud Estate Vineyard Project.* March, 20, 2011.

Napa County, 2008. *Napa County General Plan*. June 2008. Available online at: http://www.countyofnapa.org/Pages/DepartmentDocuments.aspx?id=4294970192. Accessed July, 2011.

Napa County, 2009. Certified Unified Program Agency. Available online at: http://www.countyofnapa.org/Pages/DepartmentContent.aspx?id=4294967508. Accessed July, 2011.

Napa County GIS, 2003. Hazmat Releases Search. Available online at: http://gis.napa.ca.gov/HazFac/haz_search.asp. Accessed July, 2011.

Occupational Safety and Health Administration (OSHA), 1970. Occupational Safety and Health Administration Act of 1970. Available online at: http://www.osha.gov/pls/oshaweb/owasrch.search_form?p_doc_type=oshact. Accessed July, 2011.

4.8 HYDROLOGY AND WATER QUALITY

4.8.1 SETTING

4.8.1-1 CLIMATE

The Napa Valley region has a Mediterranean climate characterized by warm, dry summers and cold, wet winters. The vast majority of the precipitation occurs in the form of rain, though snow is not uncommon at higher elevations. Approximately 90 percent of annual precipitation falls as rain during the winter and early spring months. Annual precipitation varies significantly from year to year, and deviations can be as high as 200 percent from the 85-year average. In general, precipitation varies significantly throughout Napa County ranging from 22.5 inches per year to 75 inches per year, decreasing from north to south and with lower elevations (NCCDPD, 2005). The greatest rainfall intensity occurs in the mountain regions along the northern and western edges of Napa County. For 100-year, 24-hour, and six-hour storm events, the maximum amount of precipitation ranges from five to 14 inches (NCCDPD, 2005). In the Upper Napa River Watershed, the mean annual precipitation is 30 to 50 inches. In comparison, between 1961 and 1990, the average annual precipitation was between 35 to 40 inches in the western portion of the Napa River watershed, and between 20 to 25 inches in the eastern portion of the Napa River watershed. In the Upper Napa River Watershed, and the mean annual temperature is 54° to 55° F and the frost-free season is 200 to 250 days.

4.8.1-2 SURFACE WATERS

The topography of Napa County consists of a series of parallel northwest-trending mountain ridges and intervening valleys of varying sizes. These mountain ridges subdivide the County into three principal watersheds: Napa River watershed, Putah Creek/Lake Berryessa watershed, and Suisun Creek watershed. The Napa River watershed covers an area of approximately 426 square miles and extends in a northwesterly direction roughly 45 miles from San Pablo Bay to the hills north of Calistoga. The Napa River watershed includes primarily a central valley floor contained on three sides by mountains to the north, west, and east. The watershed further demarcated into the Upper Napa River Watershed and the Napa River watershed. The Upper Napa River watershed extends from the northern headwaters of the Napa River on Mount St. Helens to Howell Mountain to the east and Sulphur Creek to the west (NCRCD, 2002).

The Napa River is the largest river in Napa County and drains numerous tributaries of the watershed along a 55-mile stretch from Mount St. Helena to the San Pablo Bay where it empties to the south. The lowest reaches of the Napa River and its tributaries north into the City of Napa are influenced by tides due to the proximity to San Pablo Bay.

In general, tributaries to major drainages typically form canyons in their steeper upstream reaches, where they flow over the more resistant bedrock of the mountainous areas. In terms of geomorphic form, Napa County streams typically descend from steep headwater reaches onto alluvial fan surfaces and then onto valley floors. Some of the upstream reaches of tributaries are intermittent, while others are perennial. The downstream reaches, especially of the larger streams, are generally perennial. Stream flows generally peak in January or February and are lowest from August through November. Average and maximum stream flows are scaled with drainage areas.

There are 28 dams in the Napa River watershed with individual water storage capacities greater than 28 acre-feet (af) (Stillwater Sciences et al., 2002). Seventy-one percent of the total reservoir storage in the watershed is in Conn Creek Reservoir (Lake Hennessey). Other significant dams include Rector Creek, Bell Canyon, and Milliken Creek dams. All of these dams are located on the tributary streams along the eastern side of the watershed, and effectively block every major east side tributary between St. Helena and Napa, except Soda Creek.

Kortum Canyon Creek Watershed

The property is situated along the main ridge separating Sonoma and Napa counties. The property consists of one 38-acre parcel. Onsite elevations range from 1,600 to 1,800 feet above sea level. The property is located in the uppermost portion of the Simmons Creek watershed (Calwater 2206.500102) within the Kortum Canyon Creek subwatershed. Simmons Creek, the major tributary of the larger watershed, consists of about 3.5 miles of channel and joins the Napa River approximately one mile southeast of the town of Calistoga. The property contains slopes ranging from 3 to 42 percent (NVVE, 2011). There is a gentle ridge at the top of the property with east facing slopes. The property contains two Class III watercourses, one Class IV drainage, and a spring with adjacent wet area in the southwest corner of the property. The two Class III channels drain approximately nine acres of the property, while the remainder of the property drains to divergent planar slopes with no developed channels (OEI, 2011a).

Drainage

About 3.3 miles downstream from the property, at the crossing of Highway 128, is an unnamed tributary to which the property drains, which has a total drainage area of about 1,677 acres. Two Class III channels drain approximately 9 acres of the property, with the remainder of the property draining to divergent and planar slopes with no developed channels in the northeast. Together, these streams make up the majority of the surface drainage system for the project (60 percent), with the rest flowing down as sheet flow (OEI, 2011a). A developed spring is located in the southwestern quadrant of the property, outside of the project footprint. Presently, there is a two inch PVC pipe that extends across the wet

area linking the spring site to a water tank located to the north. This entire area is located outside of the timber harvest and vineyard conversion construction activities and is therefore not considered to be part of the Proposed Project.

Runoff Potential

The primary landscape feature affecting the volume and the rate of runoff are soil type, use, vegetative cover, and slopes. The most predominate soil type located at the property is classified by the U.S. Department of Agriculture (USDA) Soil Conservation Service for the Napa County Soil Survey as the Aiken Loam series (SCS 100 and 102). Hydrologic soils are classified based on the minimum infiltration rate obtained for the bare soil after prolonged wetting (USDA, 1986). The Aiken Loam is in hydrologic soil Group B and is described as having "moderately low runoff potential when thoroughly wet," and water transmission through the soil is unimpeded (USDA, 2007). In general, Group B soils typically have between 10 percent and 20 percent clay and 50 to 90 percent sands and have loamy sand or sandy loam textures. Please see **Section 4.5 Geology and Soils**, for a detailed description of the soils on the property.

Different land uses require different types and amounts of coverage by vegetation, which influences runoff. Currently, the property consists of the unnamed drainage basin and heavily-vegetated forest areas. Habitats with dense vegetation coverage disperse runoff by intercepting precipitation and providing obstacles to the concentration of runoff. Roads and fords across the unnamed drainage channels also provide runoff concentration areas due to the lack of interceptors and obstacles to runoff. The property contains areas with both steep and gentle slopes, any runoff that is allowed to concentrate after flowing over soils in these areas flows into the onsite streams.

A detailed Erosion Control Plan (ECP) (**Appendix B**) has been created for the property by the Napa Valley Vineyard Engineering, Inc. (NVVE) to comply with Napa County regulatory requirements. As of August 18, 2011, the Napa County Resource Conservation District determined that the ECP meets all technical adequacy requirements. The complete ECP for the Proposed Project (#P10-00309-ECPA) is included as **Appendix B** (NVVE, 2011). The ECP provides for modifications of runoff patterns on the property to assist with mitigating impacts from erosion. To mitigate potential erosion, the ECP suggests four along-contour diversion ditches to prevent overland flow from becoming sufficiently concentrated to cause excess erosion. These diversion ditches will increase flow path lengths and reduce the velocity of flows directed towards onsite detention basins. There are four detention basins proposed as part of the ECP that are located at the periphery of vineyard blocks A, C, G, and H (**Figure 3-4c**).

Flooding

Napa County is a flood-prone region as a result of the Mediterranean climate with wet winters and dry summers, and a landscape of steep hills and a wide valley floor. Flooding from tidal fluctuations in Napa County can also occur, but is limited to areas in the lowland sloughs of the southern portion of the County. Downstream flooding may cause hazards if flows are impeded by crossings, culverts, or roads, and if structures in urban areas are inundated with flood flows from upstream. The Federal Emergency Management Agency (FEMA) has mapped flood zones in Napa County for 100- and 500-year flood events. The Proposed Project is not located within any FEMA designated flood zones (FEMA map 06055C0240E).

Surface Water Quality

Sediment Loading

Runoff from the property is eventually transported to the Napa River, which is currently listed as an impaired water body for nutrients, pathogens, and sediment under Section 303 (d) of the Clean Water Act (CWA). The construction of several large dams between 1924 and 1959 on major tributaries in the eastern Napa River watershed and northern headwater areas of Napa River has affected sediment transport processes into the mainstem Napa River by reducing the delivery of the coarse load sediments to the river. Thirty percent of the Napa River watershed drains into dams, such that ponds and reservoirs behind these dams capture a significant fraction of all sediment input to channels (Napolitano, et al. 2007).

Historically, the Napa River system has typically been described as a gravel-bed river; more recently, the Napa River has become increasingly-dominated by finer sediments. The sources for these finer sediments include a variety of land use, infrastructure, and in-stream erosion sediment sources. Dams that trap sediment in the area have not significantly reduced the degree to which finer sediments are being delivered to the watershed. As a result of this fine sedimentation, habitats for steelhead, Chinook salmon, and Californian freshwater shrimp, which rely on more gravel substrate in the river, have been negatively affected from reduced gravel permeability (Stillwater Sciences et. al, 2002; Napolitano, 2007). The Regional Water Quality Control Board, San Francisco Bay District (SFRWQCB) has released a technical report that proposes a total maximum daily load (TMDL) for the Napa River that calls for substantial reductions in the amount of fine sediment deposits into the watershed to improve water quality and maintain beneficial uses of the river, including spawning and rearing habitat for salmonid species.

Temperature

Parameters that influence stream temperature include ambient air temperature, humidity, riparian vegetation, topography, surrounding land uses, and flow conditions. Water

temperature influences a number of chemical processes within water bodies. Streams in Mediterranean climates, such as in Napa County, experience naturally low summer flows which results in watersheds that are susceptible to the impacts of high water temperatures. Additionally, land development often alters channel geomorphology, which creates conditions that cause water temperatures to rise and habitat to degrade. These activities include the removal of riparian shading, reduced cold-water inputs (i.e., altered groundwater supplies), and increased surface runoff.

The Napa River watershed currently provides habitat for cold-water anadromous fish species, including steelhead trout and Chinook salmon. Water temperature is a key constituent for assessing the quality of water within the Napa River watershed. Steelhead and Chinook salmon are highly sensitive to temperature and require cold water throughout the majority of their life stages. Mainstem and tributary temperatures are elevated to a level that can cause stress to salmonids, but not high enough to be acutely lethal. Elevated temperature conditions contribute to reduced habitat conditions for salmonids, particularly when combined with low summer base flows and aggraded channels (raised from sediment).

Nutrients

Nutrients, specifically nitrogen and phosphorus, are essential for life and play a primary role in ecosystem functions. In addition to naturally present concentrations in the atmosphere and organic matter, nutrients are introduced to waterbodies through human or animal waste disposal or agricultural application of fertilizers. Nutrients are commonly the limiting factor for growth in aquatic systems. However, excessive levels of nutrients affect aquatic systems in a wide range of ways, including producing toxic or eutrophic conditions, both of which impair aquatic life. The Napa River is identified as impaired by nutrient loading according to Section 303 (d) of the CWA, as discussed in the Regulatory Framework section below (**Section 4.8.2**). Wang et al. (2004) identified numerous nutrient load contributors, including point sources such as wastewater treatment plants, and non-point sources such as septic system seepage, agricultural and urban runoff, and atmospheric deposition. No specific numeric nutrient targets for the Napa River watershed have been established by the SFRWQCB.

Pathogens

High concentrations of fecal bacteria have been recorded in the Napa River since the 1960s. Consequentially, the SFRWQCB identified the Napa River as impaired by pathogens according to Section 303 (d) of the CWA. Sources that contribute to the significant pathogen loads in the watershed include faulty onsite sewage treatment systems, failing sanitary sewer lines, municipal runoff, and livestock grazing. Past monitoring efforts indicate that urban runoff and failing septic systems are the primary pathogen sources

during wet weather months, while failing sanitary sewer lines and septic tanks may constitute the primary pathogen sources during the dry season. To address this issue, a TMDL has been developed for the Napa River and its tributaries, which implements density-based targets and zero discharge of untreated or inadequately treated human waste.

4.8.1-3 GROUNDWATER

Regional Groundwater Resources

In regional basins, municipal and irrigation wells have average depths ranging from about 200 to 500 feet. Well yields in these basins range from less than 50 gallons per minute (gpm) to approximately 3,000 gpm. The Napa-Sonoma Valley groundwater basin is one of the more heavily utilized basins in the region for groundwater supply; however, the property is not located within the boundaries of this basin. Groundwater data from the Napa Valley subbasin shows well yields at a maximum of 3,000 gpm and an average of 223 gpm (DWR, 2003). The North Napa Valley Basin (NNVB) is by far the most productive aquifer in the basin, which can locally provide water to wells at rates in excess of 3,000 gpm (NCCDPD, 2005).

Groundwater on the Property

The property is underlain by bedrock composed of Tertiary aged pummiceous ash flow tuff (map unit T_{st}) with andesitic and basaltic lava flows (map unit T_{sa}) which are part of the Sonoma Volcanic Formation. The Sonoma Volcanic Formation has moderate to high primary porosity, and as such plentiful groundwater resources are often found in these geologic units and it represents the principle water bearing geologic formation in the region (OEI, 2011b). Sonoma Volcanics generally contain groundwater in fractures and joints, in zones of deep weathering, along remnant flow channels, and between individual flow units that developed amid successive volcanic events. Due to the nature of groundwater occurring in these rocks, the amount of groundwater available to wells in the volcanic materials is highly dependent on well depth, as well as the size, frequency, openness, lateral continuity and degree of interconnection of the fractures and joints encountered in the rocks at a specific site. Wells tapping the tuffaceous volcanic aquifer yield water at an average rate of 32 gpm (NCCDPD, 2005).

Groundwater Quality

In general, groundwater quality throughout most of the San Francisco hydrologic region is suitable for most urban and agricultural uses with only local impairments. The primary constituents of concern are high total dissolved solids (TDS), nitrate, boron, and organic compounds. Releases of fuel hydrocarbons from leaking underground storage tanks and spills/leaks of organic solvents at industrial sites have caused minor to significant groundwater impacts in many basins throughout the region. Methyl tertiary-butyl ether

(MTBE) and chlorinated solvent releases to soil and groundwater continue to be problematic. Areas of high TDS (and chloride) concentrations have typically been found in groundwater basins situated close to the San Francisco Bay including the Napa Valley. Specifically, groundwater with high TDS, iron, and boron levels in other parts of Napa Valley make the water unfit for agricultural uses (DWR, 2003).

4.8.1-4 WATER SUPPLY

The Proposed Project would include a timber harvest of roughly 14 acres and subsequent conversion of 12± acres within the harvested area into a commercial vineyard producing premium quality grapes through certified Biodynamic practices. The water system for the Proposed Project consists of two existing water storage tanks that will be replaced or upgraded as part of the project and an existing developed spring in the southwestern corner of the property is anticipated to meet the water supply needs to establish the vineyard. Once established, the vineyard would be dry farmed.

Surface Water Supply

Dry farming refers to crop production during a dry season utilizing residual moisture in the soil from the rainy season, usually in a region that receives 20 inches or more of annual rainfall. Therefore, all water supplies for the Proposed Project during operation would come from surface water drainage, the onsite spring, and the existing water storage tanks. Water use on the new vineyard is expected to be 4± acre feet per annum during the establishment period.

A water balance analysis by OEI (2011b) for the Proposed Project determined that a decrease in evapotranspiration (the discharge of water from the earth's surface to the atmosphere by evaporation from lakes, streams, and soil surfaces, and by transpiration from plants), and interception (the holding of raindrops by plants as water descends onto leaves, stems, and branches during storm events) is likely to occur with the conversion from forest to vineyard. However, these decreases will allow more water to be delivered to the soil surface for infiltration, percolation, and surface flow.

Watershed experiments regarding the effects of harvesting redwood forests on streamflow and water quality have been conducted in the region for over 30 years at Caspar Creek (Ziemer 1998a; as provided in OEI, 2011b). As stated in the water balance analysis prepared by OEI (2011b), the regional proximity and general similarity of the Caspar Creek watershed to site conditions at the Proposed Project site near St Helena indicates that the experimental results at Caspar Creek would be generally applicable at the project site, despite some specific differences. For example, potential hydrologic impacts of the Proposed Project are concentrated in the Simmons Creek watershed which has a drainage

area of about 8,860 acres. The sub-basin drainage areas of interest in the project area range in area from about 0.5 to 47 acres. The North Fork Caspar Creek watershed is about 1,170 acres, and experimental sub-basins range in size from about 25 to 70 acres. These similarities in sub-basin size allow qualitative extrapolation of experimental results to the project site (OEI, 2011b).

In summary, the project site for the Proposed Project has sufficient similarity to Caspar Creek site conditions to expect general transferability of experimental results pertaining to the effects of forest canopy removal on watershed hydrology (OEI, 2011b). It should be noted that after selective harvest in the South Fork of Caspar Creek, low flows were higher than expected for 7 years, but then declined to below expected pre-treatment values for the next 20 years (Reid and Lewis 2011). For these reasons, the Caspar Creek watershed case study was used in the development of the water balance analysis by OEI (2011b) for the Proposed Project.

Groundwater Supply

As there are no existing wells on the property, OEI (2011b) was unable to examine subsurface conditions through drillers' reports. However, wells located on nearby properties are typically drilled to a depth of about 400 feet and have yields of 50 gpm. As the yields of these nearby wells are consistent with other well yields observed in productive areas of the Sonoma Volcanic Formation, it is expected that the hydrogeologic conditions of the project are similar and that a productive well could be developed if desired (OEI, 2011b). Although, as stated in **Section 3.0**, the water supply for the establishment of the proposed vineyard would be from the onsite developed spring.

Developed Spring

In the past, the developed spring in the southwest corner of property was used to supply an onsite orchard and former residence. Under the Proposed Project, a new drip irrigation system will be installed to utilize spring water for the establishment of the vineyard. Once the vineyard is established, it will be dry farmed. The area contiguous to the spring is not included in the proposed timber harvest area or vineyard footprint.

As springs are a surface expression of an aquifer, they are commonly related to the presence of impermeable layers in the subsurface that do not allow groundwater to percolate down or to flow through. The impermeable layer causing the onsite spring is unknown, but the presence of the spring indicates that the water table is near the ground surface in the immediate vicinity of the spring; this could affect evapotranspiration and runoff rates in the localized area (OEI, 2011b). However, there is no evidence that shallow groundwater exists in other areas of the Proposed Project within the project footprint; therefore, the water balance is not changed by the spring. Water from the spring does not

flow off the property and diversion from the spring under the Proposed Project for the establishment of the proposed vineyard is not anticipated to exceed 25 acre-feet per annum (D. Aspegren, pers. comm., 2011). Furthermore, the State Water Resources Control Board, Division of Water Rights does not exercise authority over use of water from springs whose water does not flow off the property, provided that use is less than 25 acre-feet (D. Aspegren, pers. comm., 2011).

Spring flow was measured at the developed spring to be equivalent to 4.24 acre-feet of flow for a 120 day growing season (OEI, 2011b). As there is a net 12± acres of proposed vineyards, and typical irrigation rates in Napa County are between 0.2 and 0.5 acre-feet, that equates to between 2.42 and 6.05 acre-feet of irrigation per growing season; therefore, the spring flow is midrange of typical irrigation rates and would be adequate to supply water irrigation for the proposed vineyard's establishment period (OEI, 2011b).

4.8.2 REGULATORY FRAMEWORK

4.8.2-1 FEDERAL

The Federal CWA is the primary federal law that protects the quality of the nation's surface waters, including lakes, rivers, and coastal wetlands. It operates on the principle that all pollutant discharges into the nation's waters are unlawful unless specifically authorized by a permit. The CWA authorizes the U.S. Environmental Protection Agency (USEPA) to protect and maintain the quality and integrity of the nation's waters. Part of the CWA provides for the National Permit for Discharge Elimination System (NPDES), in which discharges into navigational waters are prohibited except in compliance with specified requirements and authorizations (discussed in detail below).

4.8.2-2 STATE

The Regional Water Quality Control Plan for the San Francisco Bay Basin and the California Enclosed Bays and Estuaries Plan serve to protect the water quality of the state consistent with identified beneficial uses. These plans govern the waste discharge and non-point source control requirements in the state through the regional boards.

Section 303 (d) of the CWA requires that each state identify water bodies or segments of water bodies that are "impaired" (i.e., not meeting one or more of the water quality standards established by the state). Once a water body or segment is listed, the state is required to establish a TMDL for the pollutant causing the conditions of impairment. The TMDL is the quantity of a pollutant that can be safely assimilated by a water body without violating water quality standards. The intent of the 303 (d) list is to identify the water body as requiring future development of a TMDL to maintain water quality and reduce the potential for

continued water quality degradation. The SFRWQCB has identified waters that are polluted and need further attention to support their beneficial uses. The 303 (d) list includes the Napa River for nutrients, pathogens, and sedimentation/siltation.

The SFRWQCB identifies beneficial uses and water quality objectives for surface waters in the region, as well as effluent limitations and discharge prohibitions intended to protect those uses. The existing beneficial uses designated for the Napa River are agricultural, municipal, and domestic supply, cold freshwater habitat, fish migration, navigation, preservation of rare and endangered species, water contact and non-water contact recreation, fish spawning, warm freshwater habitat, and wildlife habitat.

National Pollutant Discharge Elimination System

In California, the Environmental Protection Agency has delegated the implementation of this program to the State Water Resources Control Board (State Water Board) and Regional Water Quality Control Boards. The NPDES program regulates municipal and industrial storm water discharges under the requirements of the CWA. Initially, the NPDES program permits focused on regulating point source pollution. In the early 1970s, an amendment to the CWA directed the NPDES program to address non-point source pollution through a phased approach.

The NPDES is federally mandated, but enforced locally. Applicants with construction projects disturbing one or more acres of soil are required to file for coverage under the State Water Board, Order No. 2009-0009-DWQ, NPDES General Permit No. CAS000002 for Discharges of Storm Water Runoff Associated with Construction Activity (General Permit). Construction activities include clearing, excavation, stockpiling, and reconstruction of existing facilities involving removal and replacement. During installation, the Erosion Control Plan (ECP) would cover the stormwater management requirements under the General Permit.

4.8.2-3 LOCAL

The Napa County General Plan (General Plan) serves as a broad framework for planning within Napa County (Napa County, 2008). State law requires general plans to cover a variety of topics. The General Plan contains goals and policies related to: open space conservation, natural resources, water resources, safety, circulation, and provides guidance for issues related to hydrology and water quality. Applicable General Plan policies for the Proposed Project are provided below.

Open Space Conservation Policies

Policy CON-6: The County shall impose conditions on discretionary projects which limit

development in environmentally sensitive areas such as those adjacent to rivers or streamside areas and physically hazardous areas such as floodplains, steep slopes, high fire risk areas and geologically hazardous areas.

Water Resources Goals and Policies

Goal CON-8: Reduce or eliminate groundwater and surface water contamination from known sources (e.g., underground tanks, chemical spills, landfills, livestock grazing, and other dispersed sources such as septic systems).

Goal CON-9: Control urban and rural storm water runoff and related non-point source pollutants, reducing to acceptable levels pollutant discharges from land-based activities throughout the county.

Goal CON-10: Conserve, enhance and manage water resources on a sustainable basis to attempt to ensure that sufficient amounts of water will be available for the uses allowed by this General Plan, for the natural environment, and for future generations.

Goal CON-11: Prioritize the use of available groundwater for agricultural and rural residential uses rather than for urbanized areas and ensure that land use decisions recognize the long term availability and value of water resources in Napa County.

Goal CON-12: Proactively collect information about the status of the county's surface and groundwater resources to provide for improved forecasting of future supplies and effective management of the resources in each of the County's watersheds.

Policy CON-42: The County shall work to improve and maintain the vitality and health of its watersheds. Specifically, the County shall:

d) Support environmentally sustainable agricultural techniques and best management practices (BMPs) that protect surface water and groundwater quality and quantity (e.g., cover crop management, integrated pest management, informed surface water withdrawals and groundwater use).

Policy CON-47: The County shall comply with applicable Water Quality Control/Basin Plans as amended through the Total Maximum Daily Load (TMDL) process to improve water quality. In its efforts to comply, the following may be undertaken:

e) Ensuring continued effectiveness of the National Pollution Discharge Elimination System (NPDES) program and storm water pollution prevention.
f) Ensuring continued effectiveness of the County's Conservation Regulations related to

vineyard projects and other earth-disturbing activities.

Policy CON-48: Proposed developments shall implement project-specific sediment and erosion control measures (e.g., erosion control plans and/or stormwater pollution prevention plans) that maintain pre-development sediment erosion conditions or at minimum comply with state water quality pollution control (i.e., Basin Plan) requirements and are protective of the County's sensitive domestic supply watersheds. Technical reports and/or erosion control plans that recommend site-specific erosion control measures shall meet the requirements of the County Code and provide detailed information regarding site specific geologic, soil, and hydrologic conditions and how the proposed measure will function.

Policy CON-50: The County will take appropriate steps to protect surface water quality and quantity, including (the following specific policies):

a) Preserve riparian areas through adequate buffering and pursue retention, maintenance, and enhancement of existing native vegetation along all intermittent and perennial streams through existing stream setbacks in the County's Conservation Regulations.
c) The County shall require discretionary projects to meet performance standards designed to ensure peak runoff in 2-, 10-, 50-, and 100-year events following development is not greater than predevelopment conditions.
e) In conformance with National Pollution Discharge Elimination System (NPDES) requirements, prohibit grading and excavation unless it can be demonstrated that such activities will not result in significant soil erosion, silting of lower slopes or waterways, slide damage, flooding problems, or damage to wildlife and fishery habitats.

Policy CON-52: Groundwater is a valuable resource in Napa County. The County encourages responsible use and conservation of groundwater and regulates groundwater resources by way of its groundwater ordinances.

Policy CON-53: The County shall ensure that the intensity and timing of new development are consistent with the capacity of water supplies and protect groundwater and other water supplies by requiring all applicants for discretionary projects to demonstrate the availability of an adequate water supply prior to approval. Depending on the site location and the specific circumstances, adequate demonstration of availability may include evidence or calculation of groundwater availability via an appropriate hydrogeologic analysis or may be satisfied by compliance with County Code "fair-share" provisions or applicable State law. In some areas, evidence may be provided through coordination with applicable municipalities and public and private water purveyors to verify water supply sufficiency.

Safety Goals and Policies

Goal SAF-5: To protect residents and businesses from hazards caused by human activities.

Policy SAF-30: Potential hazards resulting from the release of liquids (wine, water, petroleum products, etc.) from the possible rupture or collapse of aboveground tanks should be considered as part of the review and permitting of these projects.

Circulation Goals and Policies

Policy CIR-8: Roadway, culvert, and bridge improvements and repairs shall be designed and constructed to minimize fine-sediment and other pollutant delivery to waterways, to minimize increases in peak flows and flooding on adjacent properties, and where applicable to allow for fish passage and migration, consistent with all applicable codes and regulations.

Napa County Code (Chapter 18.108 – Conservation Regulations)

Napa County Code 18.108 includes conservation regulations such as requirements for standard erosion control measures, provisions for intermittent or perennial streams, requirements for use of erosion hazard areas. This section of the code also defines streams and provides stream setbacks for grading and land clearing for agricultural development (see **Section 4.3 Biological Resources** for the discussion of this code section).
Some portions of the property have slopes greater than five percent, therefore, under Napa County Code Section 18.108.070, the Proposed Project would require permit approval prior to any grading activities (see **Section 3.0 Project Description**).

Napa County Resource Conservation District (RCD)

The RCD published the Napa River Watershed Owner's Manual in 1996. This manual lists the following objectives and recommendations that pertain to the Proposed Project:

> Objective G: Reduce Soil Erosion
> Recommendation G2: Reduce erosion resulting from agricultural activities. Agricultural activities in the Napa River watershed include grazing, viticulture, small farms and horticulture. Soil disturbance or vegetation removal as a result of agricultural activities can result in loss of topsoil and subsequent water quality degradation. Good agricultural management can also benefit water quality and wildlife habitat, and can contribute to the overall good health of the watershed. Sub-recommendations include:
>
> G2.1. Emphasize erosion prevention over sediment retention as a priority in agricultural planning and operations.

G2.2. Promote the use of permanent vegetative ground cover in vineyards. Support research, demonstrations and technology exchange to refine cover crop technology for vineyards and orchards.
G2.3. Establish tree cover in unused areas to decrease erosion of topsoil.
G2.4. Maintain access roads and farm roads to control storm water runoff in agricultural areas. Utilize assistance from the USDA Natural Resource Conservation Service, or other erosion control professionals, for design of storm water runoff control on rural roads.
G2.5. Minimize wet weather vehicle traffic through or across agricultural areas, especially on hillsides.
G2.6. Provide adequate energy dissipaters for culverts and other drainage pipe outlets.
G2.7. Establish vegetated buffer strips along waterways.
G2.8. Develop grazing management plans to increase vegetation residue on rangeland.

4.8.3 IMPACTS ANALYSIS

4.8.3-1 EROSION CONTROL PLAN FEATURES AND SURFACE RUNOFF

The basic philosophy for the design of the Proposed Project is to minimize environmental disturbance and control erosion on the property rather than capturing soil after it has been displaced. To help meet this goal, the ECP includes several different measures for prevention of erosion and control of sediment including: water bars where appropriate, temporary fiber rolls, straw mulch, the construction of rock stabilization where appropriate, detention basins, diversion ditches and installation of drop inlets and water spreaders where appropriate. Eventually, permanent vegetation crops will be placed in between the proposed vineyard blocks to help control erosion. The Proposed Project would aim to preserve the existing courses of runoff and drainage onsite, as well as features that improve the courses of runoff and drainage onsite once the vineyard blocks are in place.

Road Construction and Maintenance

Three acres of the Proposed Project site are planned to be allocated to accommodate internal farm avenues for farm trucks, equipment turn around, and vineyard maintenance operations. These avenues will be built and maintained with crushed rock as needed. The turnaround will be outsloped using rock gathered during ripping operations. Outsloping allows runoff to drain in sheetflow towards natural drainages, as opposed to sloping vineyard roads inwards, which creates the need to collect and later disperse the runoff that collects on access roads. Outsloping has been shown to be less costly and more effective than insloped roads, and helps ensure runoff does not concentrate on the road surface and

erode the road bed (Pacific Watershed Associates, 1994). This is also protective of water quality.

Irrigation Pipelines

Drip irrigation pipelines would generally be located within roadways, vineyards and vineyard avenues. Where they are not located within these areas, disturbed ground would be seeded and mulched in accordance with the ECP. There will be a piped drainage system located throughout the property to funnel drainage flow into the detention basins.

Mechanical Erosion Control

Diversion ditches and other erosion prevention features will be installed in some areas detailed in the ECP. Drop inlets and water spreaders will also be install where appropriate; these would return concentrated runoff to natural drainage courses to avoid concentrating runoff that could gain additional velocity and erosion potential. Additionally, temporary erosion control measures such as straw wattles and waterbars would be installed as needed to help decrease surface erosion and promote high infiltration rates and settling of soil sediment particulates. These measures would serve to decrease the velocity of overland flow by increasing surface roughness and adding breaks in slope.

Cover Crop

Vegetative erosion control measures would consist of a permanent no-till cover crop strategy. Disturbed areas would be seeded and mulched with a mix of seeds, and vineyard management personnel would apply fertilizer as necessary prior to September 1 before construction. A permanent cover crop would be managed in the fall of each year such that any areas that have less than the proposed vegetative cover would be re-seeded and mulched until adequate coverage is achieved. The permanent seed mix would be seeded no later than the fall of the fourth year. Maintenance of a vegetative cover crop would provide surface roughness to help prevent the concentration of runoff, collect moisture, and help prevent the loosening of soil that would be susceptible to erosion.

Wetland and Stream Setbacks

Stream setbacks will be incorporated into the project design. As discussed in **Section 4.3 Biological Resources**, Napa County Code includes setbacks for agricultural development. The minimum setback distances would also ensure that vegetation is preserved adjacent to drainages, and that water quality is minimally impacted. In accordance with **Mitigation Measure 4.3-2** (in **Chapter 4.3 Biological Resources**), project site plans have been modified to avoid direct impacts to wetlands and jurisdictional waters of the U.S. As part of the Proposed Project's design, avoidance buffers of 50 feet shall be established around the wet area and adjacent spring in the southwestern corner of the property, construction shall occur only during the dry season to minimize impacts to water quality, and staging areas

shall be located away from the areas of wetland habitat. As stated in **Section 4.3**, stream corridors have been preserved throughout the property and setbacks will include 85 feet on the west side of the northwest Class III stream and at least 35 feet on the east side as well as 35 feet on either side of the eastern Class III stream (**Appendix B; Section 4.3**).

4.8.3-2 SIGNIFICANCE CRITERIA

For the purpose of this EIR, an impact to hydrology and water quality would be significant if it would result in any one of the following:

- Alter the existing onsite drainage pattern in a manner that would substantially increase the volume and rate of surface runoff such that on- or offsite drainages become unstable (either by increased erosion or increased sediment deposition), the capacity of existing or planned stormwater drainage systems is overwhelmed, and/or significant flooding occurs;
- Alter the existing onsite drainage pattern in a manner that would substantially degrade water quality, onsite and within downstream receiving water bodies, by increasing the suspended sediment load and/or contributing other pollutants to the natural waterways;
- Expose people or structures to a significant risk of loss due to flooding; or
- 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.

4.8.3-3 IMPACTS AND MITIGATION MEASURES

Impact 4.8-1: Development of the Proposed Project would alter the existing drainage pattern of the property. This is a potentially significant impact. However, with implementation of the ECP a slight decrease in the volume and rate of runoff onsite would occur and therefore a less than significant impact on receiving waters would result.

The drainage pattern of an area will, in part, determine the rate and volume of runoff. Drainage patterns refer to the characteristics of a landscape that determine the course of runoff in an area, which is determined by the size and extent of vegetation, and topographic and geologic features. Development activities involved with the Proposed Project would alter the existing drainage pattern of the property. Lands that typically generate greater concentrations of runoff characteristically contain few obstacles, impervious surfaces, and poorly drained soils.

The timber harvest and subsequent conversion of the property into a vineyard would result in the removal of several acres of trees. Conversion of the land use would also involve soil ripping to a maximum depth of three feet, and earthmoving activities required for vineyard preparation. Installation of the proposed structural erosion control measures, including rock lined ditches, detention basins, water spreaders, and subsurface pipelines would preserve the two Class III streams, spring and adjacent wet area located onsite. The setbacks outlined in the ECP and the vegetative erosion control measures to increase ground vegetation cover would provide new obstacles to runoff concentration that would reduce impacts to onsite water features.

Hydrology Analysis Methodology

To evaluate the effects of the Proposed Project on runoff, a quantitative watershed hydrology study was completed by O'Conner Environmental Inc (OEI, 2011a). The analysis assessed the likely effects on runoff due to changes in land cover from forest to vineyard, and due to changed drainage patterns by the addition of diversion ditches and four runoff detention basins.

For the Proposed Project watershed, the TR-55 model was used (OEI, 2011a). The TR-55 is a U.S. Department of Agriculture hydrologic model that is often used for Napa County projects. TR-55 estimates runoff and peak discharge while developing hydrographs for small basins using rainfall, drainage basin topographic characterizations, and vegetative/soil cover to determine runoff potential as inputs (USDA, 1986). The analysis was executed using the GIS interface in the Watershed Modeling System (WMS 8.4) software developed by Aquaveo.

TR-55 runoff estimates were not calibrated to measured stream flow for this analysis. Prior analyses conducted in the Napa River watershed comparing USGS regional flood frequency predictions with TR-55 predictions have suggested that the TR-55 model over estimates peak flows. The use of TR-55 is considered conservative because it is expected to likely over estimate peak runoff and therefore produce a factor of safety in the capacity of detention basins controlling runoff from the site. The completed analysis for the Proposed Project focused on an analytical comparison of pre- and post-project conditions, and predictions of relative change were considered more important than the accuracy of peak flow estimates.

Rainfall

The northwestern coastal U.S. is classified as type IA out of the four 24-hour rainfall distributions (USDA, 1986). Type IA rainfall represents a Mediterranean climate with dry summers and wet winters. For the property, rainfall events of a 24-hour duration were simulated in the model for the 2, 10, 50, and 100 year reoccurrence interval storms. Rainfall

depths were determined from maps in the NOAA Atlas 2 Volume 11(OEI, 2011a). **Table 4.8-1** shows rainfall depths for typical recurrence interval storms for the property.

TABLE 4.8-1
RAINFALL DEPTHS FOR TYPICAL RECURRENCE INTERVAL STORMS ON THE PROPERTY

Recurrence Interval Storm (24 hour Duration)	Precipitation Depth (in)
2 year	5
10 year	7.2
50 year	9
100 year	9.2

Adapted from OEI, 2011; AES, 2011

Drainage basins

To determine the drainage flow of the project, the Proposed Project's basins were delineated into pre- and post-sub basins to assist with the hydrologic modeling. Following topographic contours and drainage patterns ending in nodes, OEI (2011a) identified nine basins pre-project, and 40 basins post project (**Appendix F**). The post-project drainage basins were created by modifying the pre-project drainage basins to reflect the changes in flow paths as suggested in the ECP. However, it should be noted that the post-Project basin total area is identical to that of the pre-Project area, which allows for direct pre- and post-Project comparison.

To evaluate pre-project baseline conditions, nine basins were defined and evaluated using the TR-55 model. The resulting hydrographs were compiled together into a composite hydrograph (**Appendix F**).

Vegetative/soil cover

The runoff potential of different land uses was determined by assigning land use curve numbers to different land uses. Land use curve numbers indicate the runoff potential of a soil and are based on ground cover and the hydrologic soil group. A curve number is attributed to different land uses to measure the influence of land cover on infiltration and runoff rates. Curve numbers depend on the vegetative type and amount of cover and the land use practice. The higher the curve number, the higher the potential for runoff. In order to ensure a conservative analysis and to simulate a no-till vineyard land cover, "close-seeded or broadcast legumes or rotation meadow" cover type was chosen with a "straight row" treatment and a "good" hydrologic condition. For undeveloped land cover types "grasslands" and "forest" both with "good" hydrologic conditions were chosen. The existing orchard land was simulated with "Woods-grass combination", also with "good" hydrological condition. "Good" conditions encourage average and better than average infiltration and tend to decrease runoff (USDA, 1986). For all buildings or significantly developed pieces of ground the cover type chosen was "Farmsteads-buildings, lands, driveways, and surrounding lots" was used. Soils are classified into four groups (A, B, C, and D) according

to the infiltration rate for rainfall, and are classified ranging from high infiltration rate and low runoff potential (Soil Group A) to very slow infiltration rate and a high runoff potential (Soil Group D. As mentioned in **Section 4.5** the soils located at the property are classified by the USDA Soil Conservation Service Napa County Soil Survey as SCS 100 and 102, Aiken Loam. The Aiken Loam series is in the hydrologic soil group B and is described as having moderately low runoff potential when thoroughly wet (USDA, 2007).

Runoff Detention/Diversion ditches
In their analysis, OEI (2011a) includes the four detention basins shown on the ECP for the property (Detention Basins A, B, G, and H; **Appendix B**). The detention basins are designed to mitigate predicted increases of runoff due to the change of groundcover from vegetation to vineyards. The four detention basins would be formed by rock walls embedded with filter fabric to allow slow seepage of detained runoff water. The four detention basins are shown in **Figure 3-4c** and are discussed below.

Detention Basin A is located in the northwestern part of the property and would receive post-project flows from the southwestern and northwestern portions of the property, primarily including proposed vineyard block A. Detention Basin A would also drain a portion of the neighboring parcel to the west. Runoff from these areas would be collected in diversion ditches and then routed via drop inlets into an 18 inch underground pipe which then delivers the runoff to Detention Basin A.

Proposed Detention Basin B is located in the northern central portion of the property. Post-project drainage flows arriving at Detention Basin B originate from the northern and central portions of the property, which will contain the largest areas of the proposed vineyard blocks. Runoff from these areas would be collected in diversion ditches and then routed via drop inlets into an 18 inch underground pipe which will then deliver the flow to Detention Basin B.

Proposed Detention Basin G is located in the southeast section of the property to the north of the southeastern Class III stream (**Appendix F**) and is proposed to receive runoff post-project from the central-eastern portion of the property. The flow would be collected in diversion ditches and routed via drop inlets into an 18 inch underground pipe network which would funnel flow southeast into Detention Basin G. Additional flow from the area of the proposed vineyard to the north and adjacent to the basin would arrive into Detention Basin G as sheet flow.

Proposed Detention Basin H is located in further south than Detention Basin G and receives drainage post-project from proposed vineyard block H. This Detention Basin H would drain the southeastern edge of the property and a portion of the neighboring parcel to

the east and south. Onsite runoff from the southwest and immediately adjacent to Detention Basin H would be collected in diversion ditches then routed via drop inlets into an 18 inch underground pipe which delivers the flow to the detention basin.

The primary outlets for Detention Basins A, B, G, and H are a 1 foot diameter standpipe opening 3 feet above the basin's base. Water flowing away from these basins will meet spreaders that will distribute the outgoing flow at rates that will safely dissipate outflows without causing surface erosion. The four detention basins will also have a 10 foot long broad crested weir spillway located 3 feet above the pond base and 1 foot above the standpipe inlet elevation. Flow through the spillway is expected only during the 100-year, 24-hour storm design. Refer to the site plan of the ECP in **Appendix B** for engineering drawings of the proposed detention basins.

Results

Resultant hydrographs for the post-project basins were calculated using the TR-55 model. To create composite hydrographs for the inflow for each detention basin, OEI summed the individual basin hydrographs of post-project drainage flows which were compiled into a single hydrograph for each detention basin. This was repeated to account for the 2, 10, 50, and 100 year 24-hour design storm scenarios. These were then compared to the pre-project baseline hydrograph. Collectively these results provide a perspective on surface runoff throughout the property.

Composite peak runoff for existing pre-project and post-project conditions with and without detention basins for the 2, 10, 50, and 100 year, 24-hour rainfall events is compared in **Table 4.8-2** below. For the 100 year flow event, the model calculated the pre-project peak runoff rate on the property to be 84.5 cfs. The model then calculated the peak runoff rate for the 100 year flow event post-project without the four detention basins to be 94.4 cfs, an 11.6 percent change from existing conditions. With the detention basins, the percent changed only by -0.2 to 84.4. Pre-project runoff rate for a two-year flow event was 20.3 cfs. After development of the Proposed Project, but without the four detention basins, the calculated peak flow rate is 25.2, which represents an increase of 24.3 percent. With the four detention basins, however, the calculated peak flow rate was 20.0, a -1.5 percent change.

TABLE 4.8-2
COMPOSITE PEAK FLOW COMPARISON FOR THE PROPERTY

24 Hour Rainfall Event	Existing Conditions (CFS)	Proposed Conditions Without 4 Detention Basins (CFS)	% Change	Proposed Conditions With 4 Detention Basins (CFS)	% Change
100 year	84.5	94.4	11.6%	84.4	-0.2%
50 year	81.0	90.6	11.9%	80.9	-0.1%
10 year	50.6	58.6	15.9%	46.2	-8.7%
2 year	20.3	25.2	24.3%	20.0	-1.5%

Adapted from OEI, 2011a; AES 2011

A summary of predicted runoff rates for the property pre- and post-project is provided in the OEI report, included as **Appendix F**. As shown in **Appendix F**, peak runoff rates for the 10- and 50-year rainfall events also show a decreasing trend from preexisting conditions, -0.1 percent and -8.7 percent respectively, when the proposed conditions include the proposed detention basins. Without the four detention basins, flows within the property increase. It is expected that required maintenance for all proposed diversion and detention structures will be performed on a routine basis to ensure effective operation and detention function.

Decrease in peak discharge runoff is attributed to precautionary erosion control measures detailed in the ECP. Through sediment retention practices, diversion ditches and piping, vegetative cover, and sediment basins, there will be an increase in water concentration time which would delay peak flows and slightly reduce the peak discharge from its current conditions.

Drainage System Capacity and Flooding

The Proposed Project includes the construction of drainage pipelines and diversion ditches, and these features were included in the hydrologic model of post-project conditions. These features would provide adequate pathways for runoff flows on the property, as discussed in the review of ECP features and surface runoff. Runoff, instead of increasing near low-flow outlets and being constrained by the high lag time as would be expected, decreases in a similar manner to the rest of the site, indicating the influence of the land use changes is strong in affecting the rate of runoff.

Findings

Development of the Proposed Project would alter the drainage pattern of the property, but would not result in an increased rate or volume of runoff. In fact, the Proposed Project would result in a slight decrease in both the peak discharge and volume of surface runoff at the property, except for potential localized increases in peak discharge within the proposed vineyard blocks. These increases would be small and local in nature, and would be offset by decreases in the peak discharge of the immediately surrounding area. Therefore, this is

a less than significant impact. The primary reason for the decrease in runoff is the construction of diversion ditches, piping, and detention basins that would delay peak flow timing. Another factor contributing to the reduction in runoff, or lower curve numbers, are the use of a cover crop within all the vineyard blocks. Drainage system features onsite would not result in flooding because the rate and volume of runoff would not increase from the Proposed Project, and because these drainage features were determined to be appropriate for local hydrology conditions during development of the ECP. Furthermore, the Napa County Resource Conservation District determined that the ECP meets all technical adequacy requirements for erosion control (**Appendix B**). This is a less than significant impact.

Mitigation Measure 4.8-1: No mitigation is required.

Impact 4.8-2: Development of the Proposed Project has the potential to alter sedimentation levels in runoff flowing to off-site receiving waters.

As discussed in **Impact 4.8-1**, development of the Proposed Project would alter the existing drainage pattern of property through the removal of existing vegetative land cover, soil ripping and earthmoving activities, and the removal of trees. Alteration of the existing drainage pattern resulting in an increased volume and rate of runoff to these drainages could result in increased loading of sediment and pollutants to onsite drainages, and subsequently offsite streams and the Napa River. The increased accumulation of sediments in receiving waters could increase fine-grained sediment accumulation which could result in increased turbidity and alteration of crucial biological habitat conditions. The increased loading of nutrients, including chemicals applied to vineyard areas, could result in eutrophication and toxic conditions. Increased sediment accumulation has the potential to result in adverse impacts to water temperature. Degradation of water quality could impact chemical and biological conditions and beneficial uses of onsite and receiving waters.

Sediment Loading

Since the mainstem Napa River has been listed as sediment-impaired according to the Clean Water Act, Section 303 (d), no net increase in sediment yield from the property should be allowed to occur from development of the Proposed Project. As discussed in **Impact 4.5-1**, with incorporation of erosion and runoff control measures proposed in the ECP and discussed above, the overall load of sediment transported to local waterways from the site of the Proposed Project is anticipated to remain the same or decrease from pre-project conditions. Total sediment erosion and sediment yield including gravel, sand, silt, and clay may decrease from existing conditions under the Proposed Project. The onsite entry road to the property is a current source of erosion and sedimentation. Although the existing road occurs outside of the THP and proposed vineyard footprints, it is included within the ECP

specifically to employ erosion control measures to reduce current erosion on the property as a whole. Therefore, implementation of the ECP for the Proposed Project would be beneficial in reducing off-site erosion and sedimentation loads from contributing to sedimentation entering the Napa River. Thus, this is a less than significant impact. For a more detailed analysis of the project impacts to sediment loading from erosion, refer to **Section 4.5 Geology and Soils**.

Chemical Loading

The Proposed Project will be operated as a Biodynamic vineyard and certified by Demeter, USA. Maintenance of the vineyard will be primarily through hand tilling and manual removal of weeds. The use of chemical pesticides and herbicides will be applied only as a last resort method by a certified pesticide applicator (CPA). Fertilizers proposed for use at the property include: nitrogen, phosphorus, potassium, micro-nutrients, and compost. Use of fertilizers can result in runoff laden with excessive plant nutrients, which can lead to eutrophication and algal growth in receiving waters; pesticide use can result in runoff contributing to toxic conditions in receiving waters.

Temperature

Water temperature influences a number of chemical processes within water bodies. The elevation of the water temperature is influenced by ambient air temperature, humidity, riparian vegetation, topography, surrounding land use, and flow conditions.

The Proposed Project would not alter the topography of onsite creeks. Diversion ditches, sediment basins, water spreaders, and can trap sediments to reduce the loosening of topsoil. The stream setbacks would be 35 feet on either side of the southeastern Class III stream, 85 feet on the west side of the northwestern Class III stream and at least 35 feet on the east side, and 50-foot minimum setback would be maintained around the onsite spring and adjacent wet area. All setbacks maintained onsite would also help to preserve natural stream function. As determined from the sediment budget discussed in **Impact 4.5-1**, sediment yield from the proposed vineyard and sediment accumulation in receiving waters would be expected to remain the same or decrease with the Proposed Project. Potential impacts from sedimentation that can increase water temperature, such as excess sediment runoff due to the conversion of timberland to vineyard, would not occur. This is a less than significant impact.

Mitigation Measure 4.8-2: No mitigation is required.

Impact 4.8-3: The Proposed Project would not be located in a FEMA flood zone. Development of the Proposed Project would not exacerbate flooding or expose people or structures to a risk of loss. This is a less than significant impact.

Development of the Proposed Project would not be located within a FEMA mapped flood zone for a 100- or 500-year precipitation event. According to the hydrology analysis presented in **Impact 4.8-1**, no increase in the rate or volume of runoff is anticipated to occur along project watercourses under the Proposed Project conditions. The Proposed Project would not exacerbate flood flows downstream, impede or redirect flood flows or expose people or structures to flooding hazards.

Mitigation Measure 4.8-3: No mitigation is required.

Impact 4.8-4: Development of the Proposed Project would not 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. This is a less than significant impact.

The Proposed Project would not withdraw groundwater to supplement its water resources. Instead, the Proposed Project would capture flow from the on-site developed spring for its water uses. As the developed spring is not near any existing streams and water comes naturally to the surface at this location, the supply is not from groundwater but from sheet flow. As stated in **Section 4.8.1-5**, water from the spring does not flow off the property and diversion from the spring under the Proposed Project for the establishment of the proposed vineyard is not anticipated to exceed 25 acre-feet per annum (D. Aspegren, pers. comm., 2011). Furthermore, the State Water Resources Control Board, Division of Water Rights does not exercise authority over use of water from springs whose water does not flow off the property, provided that use is less than 25 acre-feet (D. Aspegren, pers. comm., 2011). Because the spring is expected to provide enough water to ensure the establishment of the vineyard based on the yields identified, spring water is anticipated to be sufficient for the Proposed Project. Therefore, the development of the Proposed Project would not impact local or regional groundwater levels. This is a less than significant impact.

Mitigation Measure 4.8-4: No mitigation is required.

REFERENCES

Aspegren, Drew. 2011. Personal communication via email. Napa Valley Vineyard Engineering. November 3, 2011

DWR, 2003. *San Francisco Bay Hydrologic Region.* California's Groundwater Update 2003. Bulletin 118. California Department of Water Resources.

Napa County, 2008. *Napa County General Plan*. June 3, 2008. Available online at: http://www.countyofnapa.org/Policy/. Accessed on October 5, 2011.

Napa County Conservation, Development, and Planning Department (NCCDPD), 2005. Napa County Baseline Data Report. Napa County, California.

Napa County Resource Conservation District, 2002. *Northern Napa River Watershed Plan,* Prepared for The Department of Fish and Game. Available online at: http://www.napawatersheds.org/files/managed/Document/3804/Northern%20Napa%20River%20Watershed%20Plan%20.pdf. Accessed on October 5, 2011

Napa Valley Vineyard Engineering (NVVE), 2011. Jasud Estate LLC, Jasud Vineyard Erosion Constrol Plan for New Vineyard. August 17, 2011.

Napolitano, M., Potter, S., and Whyte, D. 2007. Napa River Watershed Sediment TMDL and Habitat Enhancement Plan. San Francisco, San Francisco Bay Water Quality Control Board, San Francisco Bay Region.

O'Conner Environmental Inc (OEI), 2011a. *Hydrologic Analysis for Jasud Vineyard.* Prepared for Analytical Environmental Services. July 6, 2011.

OEI, 2011b. *Jasud Estate Vineyard Water Balance Assessment.* Prepared for Analytical Environmental Services. July, 2011.

Pacific Watershed Associates, 1994. The Handbook of Forest and Ranch Roads. Prepared by William E. Weaver, PhD and Danny K Hagans for The Mendocino County Resource Conservation District. Arcata, CA. June 1994. Available online at: http://www.krisweb.com/biblio/gen_mcrcd_weaveretal_1994_handbook.pdf.

Reid, L.M. and J. Lewis. 2011. Effects of logging and potential climate change on dry-season flow in a coast redwood forest. Proceedings of the Fourth Interagency Conference on Research in the Watersheds: Observing, studying, and managing for

change. Fairbanks, AK, 26 Sept - 30 Sept 2011. US Geological Survey.

Stillwater Sciences and W. Dietrich, 2002. *Napa River Basin Limiting Factors Analysis, Final Technical Report.* Available online at: http://www.waterboards.ca.gov/sanfranciscobay/water_issues/programs/TMDLs/napasediment/lfa_executive_summary.pdf. Accessed on October 5, 2011

U.S. Department of Agriculture Natural Resources Conservation Service Conservation Engineering Division, Urban Hydrology for Small Watersheds TR-55. Washington, June 1986.

U.S. Department of Agriculture Natural Resources Conservation Service Engineering Division, Part 630 Hydrology Engineering Handbook, Chapter 7 Hydrologic Soil Groups. Washington, 2007.

Wang, P., L. Shariq, L. Montague, R. Kwaan, V. Kella, 2004. *Developing a Nutrient Management Plan for the Napa River Watershed.* April 5, 2004. Santa Barbara, CA: Donald Bren School of Environmental Science and Management, University of California, Santa Barbara. Available online at: http://www2.bren.ucsb.edu/~keller/courses/GP_reports/NapaRiver_final.pdf. Accessed on October 5, 2011.

4.9 LAND USE

4.9.1 SETTING

4.9.1-1 REGIONAL

The property is located within Napa County (County), which consists of approximately 788.3 square miles in northern California, northeast of San Pablo Bay. Approximately 51,000 acres of the County consists of active agriculture land and 54,000 acres consists of grazing land. The remaining area includes several towns and cities, including the City of Napa, Yountville, American Canyon, and Calistoga (WICC, 2010). Calistoga is the nearest city to the property and is located in the northwestern portion of the County, approximately two miles north of the property. Land use in this portion of Napa County primarily consists of Urban Residential, Suburban, General Industrial, and Agriculture (Napa County, 2008).

4.9.1-2 LAND USES ON THE PROPERTY

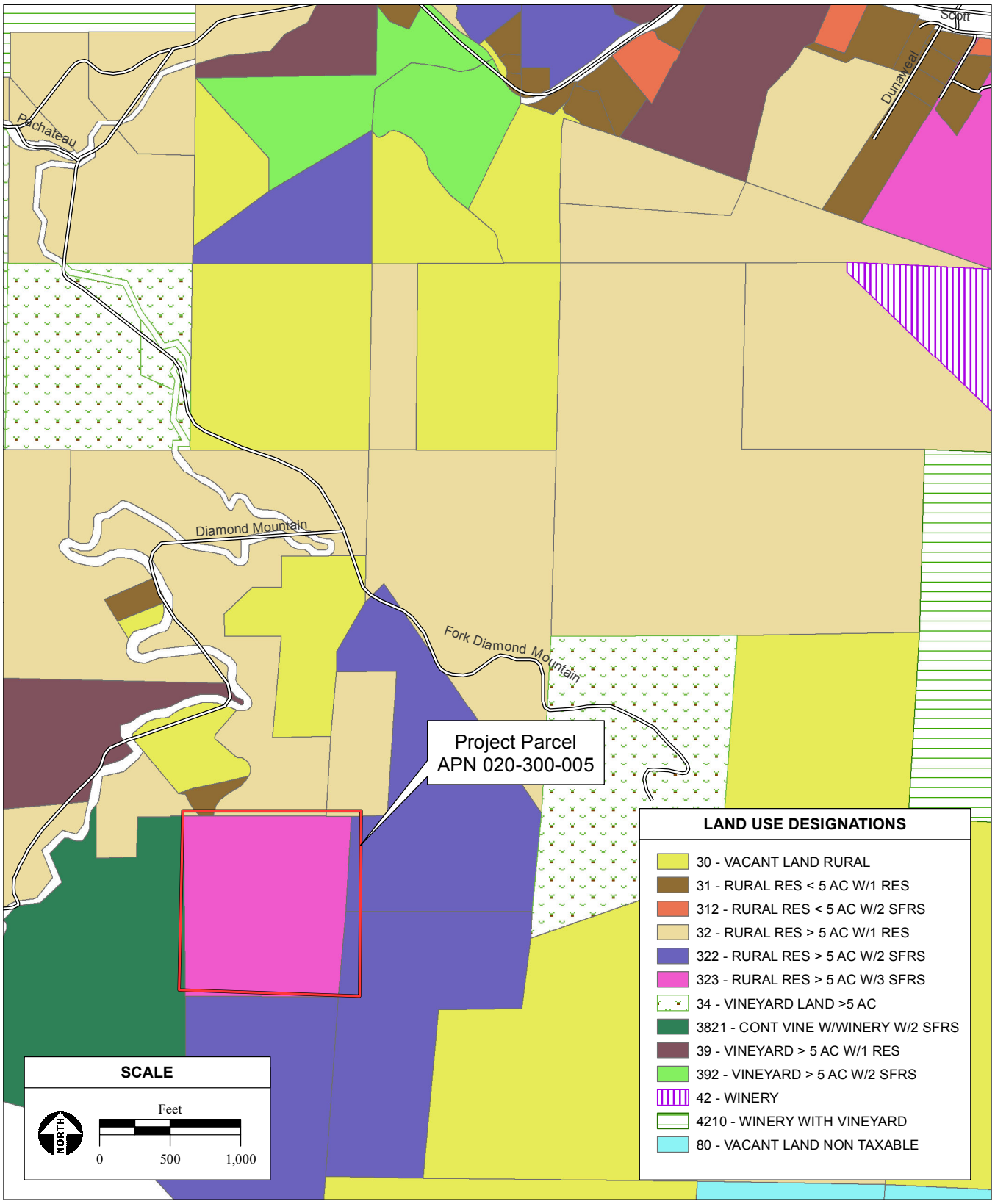
As described in **Section 3.0**, the approximately 38-acre property is situated on a southeast facing ridge near the border of Sonoma County in northwestern Napa County. The property has been harvested for timber in the past and shows signs of succession and re-growth of shrubs and trees. There is one former residence site, three outbuildings, and the remnants of a walnut and apple orchard currently on site. The structures are located outside of the development envelope on the property and will not be included within the Proposed Project or project alternatives.

4.9.1-3 SURROUNDING LAND USES

Land uses adjacent to the property primarily consist of farmland under active agricultural production, mostly vineyards, and undeveloped land. The City of Calistoga to the north of the property is characterized by low intensity agriculture and residential uses. Additionally, there are several residences in the proximity of the property. The nearest residence is located approximately 380 feet west of the property. There are no schools or hospitals in the vicinity of the property. Boethe-Napa Valley State Park is located approximately 0.4 miles directly to the south of the property.

4.9.2 REGULATORY FRAMEWORK

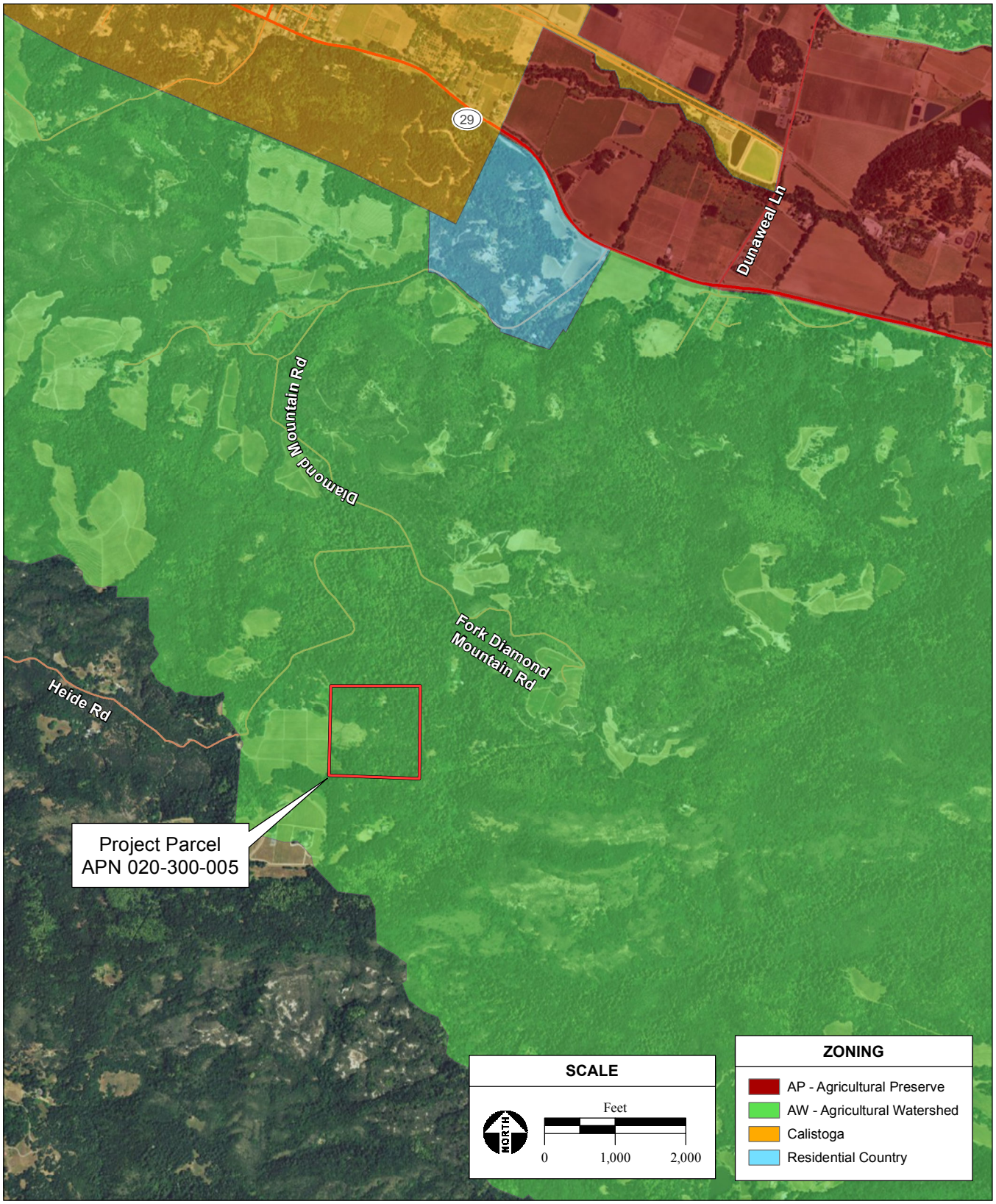
As shown in **Figures 4.9-1** and **4.9-2**, the 38± acre property is located in rural, unincorporated Napa County. The property is under the jurisdiction of the County; therefore, only the County's



SOURCE: Napa County, 2009; AES, 2011

Figure 4.9-1

Napa County Land Use Designations for Proposed Project Site



SOURCE: Napa County, 8/6/2002; NAIP Aerial Photograph, 6/7/2009; ESRI Data, 2011; AES, 2011

Figure 4.9-2

Napa County Zoning Ordinance for Proposed Project Site

General Plan and Zoning Ordinance are applicable to land uses on the site. The surrounding lands are also under the jurisdiction of Napa County.

4.9.2-1 LAND USE DESIGNATIONS AND ZONING

Napa County General Plan Land Use Designations

As shown in **Figure 4.9-1**, the Napa County General Plan's designation for the property is "Rural Residential" and land designations surrounding the property consist of "Rural Residential," "Vine with Winery," "Vineyard," and "Vacant Land Rural" to the north, south, east, and west.

Napa County Code of Ordinances - Zoning

As shown in **Figure 4.9-2**, the Napa County Zoning Ordinance has zoned the lands containing and surrounding the property as Agricultural Watershed (AW) District. The Napa County Zoning Ordinance describes the intent of the AW District designation as follows:

> *"The AW District classification is intended to be applied in those areas of the county where the predominant use is agriculturally oriented, where watershed areas, reservoirs and floodplain tributaries are located, where development would adversely impact on all such uses, and where the protection of agriculture, watersheds and floodplain tributaries from fire, pollution and erosion is essential to the general health, safety and welfare (Napa County, 2008)."*

Agricultural use, such as timber harvesting and vineyard production, is a permitted use under the AW District designation (Appendix D of **Appendix A**). Generally, permitted uses within the AW District as set forth in Section 18.20.020 include, but are not limited to, the following (Napa County, 2011):

1) Agriculture, including but not limited to, as defined in Section 18.08.040 as: (a) growing and raising trees, vines, shrubs, berries, vegetables, nursery stock, hay, grain, and similar food crops and fiber crops, and (d) sale of agricultural products grown, raised, or produces on the premises;
2) One single-family dwelling unit per legal lot;
3) A second unit, either attached to or detached from an existing legal residential dwelling unit, providing that all of the conditions set forth in Section 18.104.180 are met (Napa County, 2011); and
4) Wineries and related accessory uses which have been authorized by use permit and used in a manner set forth in Section 18.124.080 or any predecessor section; provided, that no expansion of uses or structures beyond those which were authorized by a use

permit or modification of a use permit issued prior to the effective date of the ordinance codified in this chapter shall be permitted except as may be authorized by a subsequent use permit issued pursuant to this title (Napa County, 2011).

Napa County General Plan Goals and Policies on Land Use

The Agricultural Preservation and Land Use Element of the Napa County General Plan provides the following goals and policies pertaining to land use that are applicable to the Proposed Project (Napa County, 2008):

Goal AG/LU-1: Preserve existing agricultural land uses and plan for agriculture and related activities as the primary land uses in Napa County

Goal AG/LU-3: Support the economic viability of agriculture, including grape growing, winemaking, other types of agriculture, and supporting industries to ensure the preservation of agricultural lands.

Policy AG/LU-17: The County encourages active, sustainable forest management practices, including timely harvesting to preserve existing forests, retaining their health, product, and value.

Policy CON-2: The County shall identify, improve and conserve Napa County's agricultural land through the following measures:

a) Require that existing significant vegetation be retained and incorporated into agricultural projects to reduce soil erosion and to retain wildlife habitat.
f) Minimize pesticide and herbicide use and encourage research and use on integrated pest control methods such as cultural practices, biological control, host resistance, and other factors.

Goal CON-11: Prioritize the use of available groundwater for agricultural and rural residential uses rather than for urbanized areas.

Napa County Erosion Control Plans

Erosion Control Plans are required for earthmoving activity, grading, improvement, or construction of a structure on sites of five percent slope or greater. The Napa County Conservation, Development and Planning Department administers this ordinance and grants approvals. The Napa County Resource Conservation District reviews all erosion control plans for agricultural activities proposed on slopes greater than five percent, and passes on its recommendations to the Napa County Conservation, Development and Planning Department.

Napa County Stream Setbacks

Section 18.108.025 of the Napa County Conservation Regulations states that clearing of land for new agricultural uses is required to comply with designated stream setbacks which are based on slope, unless a use permit is obtained from Napa County, or unless an exemption in Section 18.108.050 applies. Setbacks are measured from the top of the bank on both sides of the stream as it exists at the time of replanting, redevelopment, or new agricultural activity.

Napa County Slope Regulations

Section 18.108.060 of the Napa County Conservation Regulations states that no construction, improvement, grading, earthmoving activity or vegetation removal associated with the development or use of land shall take place on those parcels or portions thereof having a slope of 30 percent or greater, unless an exemption under Sections 18.108.050 or 18.108.055 apply, or unless an exception through the use permit process is granted pursuant to Section 18.108.040 and resolution 94-19.

Napa County Erosion Hazard Areas

Sections 18.108.070 and 18.108.100 of the Napa County Conservation Regulations outline requirements in erosion hazard areas, including vegetation preservation and replacement.

4.9.3 IMPACTS ANALYSIS

4.9.3-1 SIGNIFICANCE CRITERIA

Section 15125(d) of the California Environmental Quality Act (CEQA) *Guidelines* states that "[t]he EIR shall discuss any inconsistencies between the Proposed Project and applicable general plans and regional plans." Criteria for determining the significance of land use impacts have been developed based on Appendix G of the CEQA *Guidelines*. For the purposes of this EIR, land use impacts are considered significant if the Proposed Project would:

- Physically divide an existing community;
- Result in a substantial inconsistency with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project adopted for the purpose of avoiding or mitigating an environmental effect; or
- Conflict with any applicable habitat conservation plan, or natural community conservation plan.

4.9.3-2 IMPACTS AND MITIGATION MEASURES

Impact 4.9-1: The Proposed Project would not result in a substantial inconsistency with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the property adopted for the purpose of avoiding or mitigating an environmental effect.

The Proposed Project would not physically divide an established community nor is the property within an adopted habitat conservation plan or natural community conservation plan. Therefore, no impacts to these resources would result due to implementation of the Proposed Project. As described above in **Section 4.9.2-1**, the property is zoned AW by the Napa County Zoning Ordinance. Agricultural use, such as timber harvesting and vineyard production, is a permitted use under the AW District designation. Consequently, the Proposed Project is consistent with the County zoning ordinance, and General Plan (2008) land use designations, goals, and policies, and therefore would not cause impacts to land use.

Mitigation Measure 4.9-1: No mitigation is necessary.

REFERENCES

Napa County, 2008. *Napa County General Plan*. Available online at: http://www.countyofnapa.org/GeneralPlan/. Accessed July, 2011.

Napa County, 2011. Napa County Code of Ordinance. Available online at: http://library.municode.com/index.aspx?clientID=16513&stateID=5&statename=California. Codified through Ordinance No. 1365, passed October 18, 2011.

Watershed Information Center & Conservancy of Napa County (WICC), 2010. *Agricultural Resources*. Available online at: http://www.napawatersheds.org/app_pages/view/210. Accessed July, 2011.

4.10 NOISE

4.10.1 REGULATORY FRAMEWORK

4.10.1-1 FEDERAL

Federal regulations establish noise limits for medium and heavy trucks (defined as a vehicle weighing more than 4.5 tons, gross vehicle weight rating) under 40 Code of Federal Regulations, Part 205, Subpart B. The federal truck pass-by noise standard is 80 decibels (dB) at 15 meters (approximately 50 feet) from the vehicle pathway centerline. Federal regulations governing truck manufacturing implement these controls.

The Federal Highway Administration (FHWA) provides construction noise level thresholds in its Construction Noise Handbook, 2006, which are provided in **Table 4.10-1**.

TABLE 4.10-1
FEDERAL CONSTRUCTION NOISE THRESHOLDS

Noise Receptor Locations and Land-Uses	Daytime (7 AM - 6 PM)	Evening (6 PM - 10 PM)	Nighttime (10 PM - 7 AM)
	dBA, Leq[1]		
Noise-Sensitive Locations: (residences, Institutions, Hotels, etc.)	78 or Baseline + 5 (whichever is louder)	Baseline + 5	Baseline + 5> (if Baseline < 70) > Baseline + 3> (if Baseline 70)
Commercial Areas: (Businesses, Offices, Stores, etc.)	83 or Baseline + 5	None	None
Industrial Areas: (factories, Plants, etc.)	88 or Baseline + 5	None	None

[1] Leq threshold based on L10 thresholds, Leq threshold were empirically determined (FHWA, 2006).
dBA = hourly A-weighted sound level in decibels
Source: FHWA, 2006.

The FHWA establishes Noise Abatement Criteria (NAC) for various land uses categorized based upon activity. Land uses are categorized on the basis of their sensitivity to noise as indicated in **Table 4.10-2**. The FHWA NAC is based on peak traffic hour noise levels. Sensitive receptors with the potential to be impacted by operation of the Proposed Project include a few residences to the north of the property. The nearest residence is located 380 feet west of the property; thus, Category B 67 dBA, Leq noise standard would apply.

TABLE 4.10-2
FEDERAL NOISE ABATEMENT CRITERIA
HOURLY A-WEIGHTED SOUND LEVEL DECIBELS[1]

Activity Category	Activity Criteria[2] Leq (h) dBA[3]	Evaluation Location	Activity Category Description
A	57	Exterior	Lands on which serenity and quiet are of extraordinary significance and serve an important public need and where the preservation of those qualities is essential if the area is to continue to serve its intended purpose.
B[4]	67	Exterior	Residential.
C[4]	67	Exterior	Active sport areas, amphitheaters, auditoriums, campgrounds, cemeteries, day care centers, hospitals, libraries, medical facilities, parks, picnic areas, places of worship, playgrounds, public meeting rooms, public or nonprofit institutional structures, radio studios, recording studios, recreation areas, Section 4(f) sites, schools, television studios, trails and trail crossings.
D	52	Interior	Auditoriums, day care centers, hospitals, libraries, medical facilities, places of worship, public meeting rooms, public or nonprofit institutional structures, radio studios, recording studios, schools, and television studios.
E[4]	72	Exterior	Hotels, motels, offices, restaurants/bars, and other developed lands, properties or activities not included in A-D or F.
F	--	--	Agriculture, airports, bus yards, emergency services, industrial, logging, maintenance facilities, shipyards, utilities (water resources, water treatment, electricity), and warehousing.
G	--	--	Undeveloped lands that are not permitted.

[1] Either Leq(h) may be used on a project.
[2] Hourly A-weighted sound level, decibels (dBA).
[3] The leq() and l10(h) Activity Criteria values are for impacts determination only, and are not design standards for noise abatement measures.
[4] Includes undeveloped lands permitted for this activity category.
Source: FHWA, 2010b.

4.10.1-2 STATE AND LOCAL

The State of California establishes noise limits for vehicles licensed to operate on public roads. For heavy trucks, the state pass-by noise standard is equal to the federal standard (80 dB). The state pass-by standard for light trucks and passenger cars (defined as a vehicle weighing less than 4.5 tons, gross vehicle weight rating) is also 80 dB at 15 meters (approximately 50 feet) from the centerline. These standards are implemented in two ways: (1) controls on vehicle manufacturers; and (2) legal sanctions from state and local law enforcement officials on vehicle operators in violation of these standards.

The state has also established noise insulation standards for multi-family residential units, hotels, and motels that would be subject to relatively high levels of transportation-related noise. These requirements are collectively known as the California Noise Insulation Standards (Title 24, California Code of Regulations). The noise insulation standards set forth an interior day-night average noise level (Ldn) standard of 45 dB in any habitable room. They require an

acoustical analysis demonstrating how dwelling units have been designed to meet this interior standard where such units are proposed in areas subject to noise levels greater than Ldn 60 dB.

Napa County General Plan

The Napa County General Plan, adopted in 2008 (General Plan), is the guiding document for development in the unincorporated areas of the County, which include the subject property and surrounding properties. Policies in the General Plan that are relevant to noise and applicable to the Proposed Project include the following:

Goal –CC-7: Accept those sounds which are part of the County's agricultural character while protecting the people of Napa County from exposure to excessive noise.

Policy CC-35: The noises associated with agriculture, including agricultural processing, are considered an acceptable and necessary part of the community character of Napa County, and are not considered to be undesirable provided that normal and reasonable measures are taken to avoid significantly impacting adjacent uses.

Policy CC-38: Standards for maximum exterior noise levels for various types of land uses are established in the County's Noise Ordinance. Additional standards are provided in the Noise Ordinance for construction activities (i.e., intermittent or temporary noise). (Refer to **Table 4.10-3**)

Policy CC-49: Consistent with the County's Noise ordinance, ensure that reasonable measures are taken such that temporary and intermittent noise associated with construction and other activities does not become intolerable to those in the area. Construction hours shall be limited per the requirements of the Noise Ordinance. Maximum acceptable noise limits at the sensitive receptor are defined in Police CC-35.

TABLE 4.10-3
EXTERIOR NOISE LEVEL STANDARDS
(LEVELS NOT TO BE EXCEEDED MORE THAN 30 MINUTES IN ANY HOUR)

Land Use Type	Time Period	Noise Level (dBA) by Noise Zone Classification		
		Rural	Suburban	Urban
Single-Family homes and Duplexes	10 pm. to 7 am.	45	45	50
	7 am. to 10 pm.	50	55	60
Multiple residential 3 or More units Per Building (Triplex +)	10 pm. to 7 am.	45	50	55
	7 am. to 10 pm.	50	55	60
Office and Retail	10 pm. to 7 am.	60		
	7 am. to 10 pm.	65		
Industrial and Wineries	Anytime	75		

dBA = hourly A-weighted sound level in decibels
Source: Napa County, 2008.

Napa County Noise Ordinance

Section 8.16.080 Specific Types of Noise Prohibited under the County's Noise Ordinance, that are applicable to construction of the Proposed Project, includes:

2. Construction or Demolition:
   a. Operating or causing the operation of any tools or equipment used in construction, drilling, repair, alteration or demolition work between the hours of seven p.m. and seven a.m., such that the sound there from creates a noise disturbance across a residential or commercial real property line, except for emergency work of public service utilities or by variance issued by the appropriate authority. This subsection shall not apply to the use of domestic power tools, as specified in subsection (B)(3) of this section.
   b. Noise Restrictions at Affected Properties. Where technically and economically feasible, construction activities shall be conducted in such a manner that the maximum noise levels at affected properties will not exceed those listed in the following schedule (refer to **Table 4.10-4**):

TABLE 4.10-4
NOISE LIMITS FOR CONSTRUCTION ACTIVITIES

	Residential	Commercial	Industrial
Daily: 7 am. to 7 pm.	75 dBA	80 dBA	85 dBA
Daily: 7 pm. to 7 am.	60 dBA	65 dBA	70 dBA

dBA = hourly A-weighted sound level in decibels
Source: Napa County, 2008.

4.10.2 ENVIRONMENTAL SETTING

4.10.2-1 CHARACTERISTICS OF ENVIRONMENTAL NOISE

Acoustical Background and Terminology

Noise is often defined as unwanted sound. Pressure variations occurring frequent enough (at least 20 times per second) for the human ear to detect are called sounds. The number of pressure variations per second is called the frequency of sound, and is expressed as cycles per second, called hertz (Hz).

The perceived loudness of sounds depends upon many factors, including sound pressure level and frequency content. However, within the usual range of environmental noise levels, perception of loudness is relatively predictable. The decibel scale measures sound levels using the hearing threshold (20 micropascals of pressure) as the point of reference, defined as 0 dB. Other sound pressures are then compared to the reference pressure, and the logarithm is taken to keep the numbers in a practical range.

The typical human ear is not equally sensitive to all frequencies of the audible sound spectrum (20 hertz to 20,000 Hz). As a result, when assessing potential noise impacts, sound is measured using an electronic filter that de-emphasizes the frequencies below 1,000 Hz and above 5,000 Hz to better represent the human ear's sensitivity to mid-range frequencies. This method of frequency weighting is referred to as A-weighting and is expressed in units of A-weighted decibels (dBA). Frequency A-weighting follows an international standard method of frequency de-emphasis and is typically applied to community noise measurements. In practice, the level of a sound source is measured using a sound level meter that includes an electrical filter corresponding to the A-weighting curve. All of the noise levels reported herein are A-weighted unless otherwise stated. **Table 4.10-5** shows the most commonly used noise descriptors.

TABLE 4.10-5
DEFINITION OF ACOUSTICAL TERMS

Terms	Definitions
Decibel, dB	A unit describing the amplitude of sound, equal to 20 times the logarithm to the base 10 of the ratio of the pressure of the sound measured to the reference pressure, which is 20 micropascals (20 micronnewtons per square meter)
Frequency, Hz	The number of complete pressure fluctuations per second above and below atmospheric pressure.
A-Weighted Sound Level, dBA	Sound pressure level in decibels as measured on a sound level meter using the A-weighting filter network, which de-emphasizes very low and very high frequency components of the sound in a manner similar to the frequency response of the human ear and correlates well with subjective reactions to noise.
Equivalent Noise Level, Leq	The average A-weighted noise level during the measurement period.
Community Noise Equivalent Level, CNEL	The average A-weighted noise level during a 24-hour day, obtained after adding 5 decibels to measurements taken in the evening (7 to 10 pm) and 10 decibels to measurements taken between 10 pm and 7am.
Day/Night Noise Level, Ldn	The average A-weighted noise level during a 24-hour day, obtained after addition of 10 decibels to levels measured in the night between 10:00 pm and 7:00 am.
Lmax, Lmin	The maximum and minimum A-weighted noise level during the measurement period.
Ambient Noise Level	The composite of noise from all sources near and far. The normal or existing level of environmental noise at a given location.
Intrusive	That noise which intrudes over and above the existing ambient noise at a given location. The relative intrusiveness of a sound depends upon its amplitude, duration, frequency, and time of occurrence and tonal or informational content as well as the prevailing ambient noise level.

Source: FHWA, 2010a.

Noise Exposure and Community Noise

An individual's noise exposure is a measure of noise over a period of time. **Table 4.10-6** shows examples of noise sources that correspond to various sound levels. The noise levels presented in **Table 4.10-6** are representative of measured noise at a given instant. These levels rarely persist consistently over a long period of time and community noise levels vary continuously due to the contributing sound sources of the ambient noise environment. Community noise is primarily the product of many distant noise sources, which constitute a relatively stable background noise exposure. The background noise level changes throughout a typical day, but does so gradually, corresponding with the addition and subtraction of distant noise sources such as traffic and atmospheric conditions. What makes community noise constantly variable throughout a day, besides the slowly changing background noise, is the addition of short duration single event noise sources such as aircraft flyovers, moving vehicles, sirens, etc., which are typically readily identifiable to an individual. These successive additions of sound to the community noise environment vary the community noise level from instant to instant, requiring the measurement of noise exposure over a period of time to characterize a community noise environment and evaluate cumulative noise impacts.

TABLE 4.10-6
TYPICAL A-WEIGHTED SOUND LEVELS

Activities	Noise Level in Decibels
Limit of Hearing	0
Normal Breathing	10
Soft Whisper	30
Library	40
Refrigerator	50
Rainfall	50
Washing Machine	50-75
Normal Conversation	60
Hair Dryer	60-95
Alarm Clock	65-80
Power Mower	65-95
Dumpster Pickup (at 50 feet)	80
Garbage Disposal	80-95
Noisy Restaurant	85
Train Approaching (Engines)	85-90
Tractor	90
Shouting in Ear	110
Loud Rock Concert	120
Stock Car Race	130
Jet Engine at Takeoff	150

Source: Napa County, 2008.

Nighttime ambient noise levels are typically lower than daytime ambient noise levels. For this reason, and because of the potential for sleep disturbance, people tend to be more sensitive to increased noise levels at night than during the day, and increases in nighttime noise have a far greater impact on the community noise environment than increases in daytime noise.

Effects of Noise on People

The effects of noise on people can be divided into three categories:

1) Subjective effects of annoyance, nuisance, dissatisfaction;
2) Interference with activities such as speech, sleep, and learning; and
3) Physiological effects such as hearing loss or sudden startling.

Environmental noise typically produces effects in the first two categories. Workers in industrial plants can experience noise in the third category. There is no completely satisfactory way to measure the subjective effects of noise, or the corresponding reactions of annoyance and dissatisfaction. A wide variation in individual thresholds of annoyance exists, and different tolerances to noise tend to develop based on an individual's past experiences with noise.

Generally, most noise is generated by transportation systems, primarily motor vehicles, aircraft, and railroads. Poor urban planning may also give rise to noise pollution, since juxtaposing industrial and residential land uses, for example, often adversely affects the residential acoustic environment. Prominent sources of indoor noise are office equipment, factory machinery, appliances, power tools, lighting hum, and audio entertainment systems. An important way of

predicting a human reaction to a new noise environment is the way it compares to the existing environment (or ambient noise) to which one has adapted. In general, the more a new noise exceeds the previously existing ambient noise level, the less acceptable the new noise will be judged by those hearing it. With regard to increases in A-weighted noise level, the following relationships occur (Caltrans, 2009):

- Under controlled conditions in an acoustics laboratory, the trained healthy human ear is able to discern changes in sound levels of 1 dBA;
- Outside such controlled conditions, the trained ear can detect changes of 2 dBA in normal environmental noise;
- It is widely accepted that the average healthy ear, however, can barely perceive noise level changes of 3 dBA;
- A change in level of 5 dBA is a readily perceptible increase in noise level; and
- A 10-dBA change is recognized as twice as loud as the original source.

These relationships occur in part because of the logarithmic nature of sound and the decibel system. Noise levels are measured on a logarithmic scale, instead of a linear scale. On a logarithmic scale, the sum of two noise sources of equal loudness is 3 dBA greater than the noise generated by only one of the noise sources (e.g., a noise source of 60 dBA plus another noise source of 60 dBA generate a composite noise level of 63 dBA). To apply this formula to a specific noise source, in areas where existing levels are dominated by traffic, a doubling in traffic volume will increase ambient noise levels by 3 dBA. Similarly, a doubling in heavy equipment use, such as the use of two pieces of equipment where one formerly was used, would also increase ambient noise levels by 3 dBA. A 3 dBA increase is the smallest change in noise level detectable to the average person. A change in ambient sound of 5 dBA can begin to create concern. A change in sound of 7 to 10 dBA typically elicits extreme concern and/or anger.

Noise Attenuation

Stationary “point” sources of noise, including stationary mobile sources such as idling vehicles, attenuate (lessen) at a rate of 6 dBA to 7.5 dBA per doubling of distance from the source, depending upon environmental conditions (i.e., atmospheric conditions and noise barriers, either vegetative or manufactured, etc.). Widely distributed noises, such as a large industrial facility spread over many acres or a street with moving vehicles (a “line” source), would typically attenuate at a lower rate, approximately 3 to 4.5 dBA per doubling distance from the source (also dependent upon environmental conditions) (Caltrans, 2009). Noise from large construction sites (with heavy equipment moving dirt and trucks entering and exiting the site daily) would have characteristics of both “point” and “line” sources, so attenuation would generally range between 4.5 and 7.5 dBA per doubling of distance.

Vibration

The effects of groundborne vibrations typically cause only a nuisance to people, but at extreme vibration levels, damage to buildings may occur. Although groundborne vibration can be felt outdoors, it is typically an annoyance only indoors, where the associated effects of a building shaking can be notable. Groundborne noise is an effect of groundborne vibration and only exists indoors, since it is produced from noise radiated from the motion of the walls and floors of a room and may consist of the rattling of windows or dishes on shelves.

Peak particle velocity (PPV) is often used to measure vibration. PPV is the maximum instantaneous peak (inches per second) of the vibration signal. Scientific studies have shown that human responses to vibration vary by the source of vibration, which is either continuous or transient. Continuous sources of vibration include construction, while transient sources include truck movements. Generally, the thresholds of perception and annoyance are higher for transient sources than for continuous sources. Structural damage can occur when PPV values are 0.5 inches per second or greater. Annoyance can occur at levels as low as 0.1 inches per second and become strongly perceptible at approximately 0.9 inches per second (Caltrans, 2004). **Table 4.10-7** shows PPV vibration levels caused by representative construction equipment, as published by the California Department of Transportation (Caltrans).

TABLE 4.10-7
VIBRATION SOURCE LEVELS FOR CONSTRUCTION EQUIPMENT

Equipment	PPV at 25 feet (inches/second)
Large bulldozer	0.089
Excavator	0.089
Scraper	0.089
Loaded trucks	0.076
Small bulldozer	0.003

Source: Caltrans, 2004.

4.10.2.-2 EXISTING NOISE LEVELS AND SOURCES

The area surrounding the property is rural and consists of agriculture uses (vineyards) and open space with scattered residential land uses to the east and west. The nearest road to the property is Diamond Mountain Road. Traffic on this roadway is a source of noise in the vicinity of the Proposed Project. The noise environment at and in the immediate vicinity of the property is also influenced by agricultural activities due to a neighboring vineyard to the west. Due to the rural nature of the property the ambient noise level is estimated to be 55 dBA, Leq. There are no known existing sources of vibrations in the vicinity of the Proposed Project.

4.10.2.-3 SENSITIVE NOISE RECEPTORS

Some land uses are considered more sensitive to ambient noise levels than others, sensitivity being a function of noise exposure (in terms of both exposure duration and insulation from

noise) and the types of activities involved. Residential, hospital, and school land uses are generally more sensitive to noise than commercial and industrial land uses.

The project vicinity is characterized by very low-density residential and agricultural uses; most of these uses are located to the west of the property. The nearest sensitive noise receptor is a residence located approximately 380 feet west of the property. There are no schools or hospitals in the vicinity of the property.

4.10.3 IMPACT ANALYSIS

4.10.3-1 SIGNIFICANCE CRITERIA

The following criteria are established by CEQA Guidelines and have been used in this section to evaluate potential environmental impacts of the Proposed Project on sensitive noise receptors. Such an impact is considered significant if it would:

- Expose persons to or generate noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies;
- Expose persons to or generate excessive groundborne vibration noise levels;
- Cause a substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project;
- Cause a substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project;
- 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, expose people residing or working in the project area to excessive noise levels; or
- For a project within the vicinity of a private airstrip, expose people residing or working in the project area to excessive noise levels.

4.10.3-2 METHODOLOGY

Noise

Construction noise levels from construction equipment were estimated using Caltrans Guidelines. Project-related construction noise level was compared to the FHWA construction significance levels provided in **Table 4.10-1** to determine noise impact due to construction of the Proposed Project.

Traffic volumes related to the Proposed Project were compared to existing traffic volumes. Caltrans noise guidelines were used to determine traffic noise level increase along Diamond Mountain Road attributable to the Proposed Project (Caltrans, 2009). The existing noise levels were added to the increased noise attributed to the Proposed Project and was compared to applicable significance thresholds.

Increases in the ambient noise level due to stationary sources (parking lot and truck noise) were estimated using known noise levels and comparing those noise levels to the applicable significance thresholds.

Vibration

Vibration noise levels for construction and operation of the Proposed Project were determined using Caltrans guidelines (Caltrans, 2004). Those vibration noise levels were then compared to significance thresholds.

4.10.3-3 SIGNIFICANCE THRESHOLDS

According to the County's Construction Noise Ordinance 8.16.080, if construction-related noise increases the ambient noise level above 75 dBA, Leq in the vicinity of a residence, a significant impact would occur (refer to **Table 4.10-4**). According to the County of Napa's General Plan, operational noise impacts are considered significant if a project-related noise source increases the ambient noise level above 75 dBA, Leq (refer to **Table 4.10-3**).

For this analysis, excessive groundborne vibrations are defined as those that are equal to or exceed 0.5 PPV at the nearest non-residential structure, and exceed 0.1 PPV experienced at the nearest residence (Caltrans, 2004). Therefore, an impact is considered potentially significant if construction or operation of the Proposed Project would result in an increase of 0.5 PPV at the nearest non-residential structure, or 0.1 PPV at the nearest residence.

4.10.3-4 IMPACTS AND MITIGATION MEASURES

Impact 4.10.1: Construction and operation of the Proposed Project would not expose persons to a temporary or substantial permanent increase in the ambient noise level or generate noise levels in excess of standards established in the General Plan or County noise ordinance, or applicable standards of other agencies. This impact is less than significant.

Construction. Typical construction noise levels are presented in **Table 4.10-8**. Further, **Table 4.10-9** presents the noise levels generated by certain types of construction equipment. The nearest noise sensitive receptor to construction activities is a residence located approximately 380 feet west of the property. Based on the topography and natural noise barriers (trees) a noise attenuation value of 5.0 dBA, Leq per doubling of the distance was used in this noise analysis (Caltrans, 2009). Using noise levels listed in **Tables 4.10-7** and **4.10-8** (reference distance of 50 feet) the maximum noise level at the nearest sensitive noise receptor during construction of the Proposed Project would be approximately 69 dBA, Leq.

TABLE 4.10-8
TYPICAL CONSTRUCTION NOISE LEVELS

Construction Phase	Noise Level (dBA, L_{max} at 50 feet)
Excavation	87
Foundations	85
Building	87
Finishing	89
Paving	85

Source: Caltrans, 2009

TABLE 4.10-9
TYPICAL CONSTRUCTION EQUIPMENT NOISE

Type of Equipment	Noise Level (dB at 50 feet) (dBA, L_{max})
Bulldozers	87
Excavator	85
Heavy Trucks	88
Vacuum Street Sweeper	80
Pneumatic Tools	85
Concrete Pump Truck	82
Backhoe	85
Paver	85

Source: Caltrans, 2009

Tree falling with gasoline-powered chain saws would produce noise levels of approximately 90 dBA at 25 feet (NPC, 2004) and onsite saw mills are estimated to produce noise levels of approximately 100 dBA at 25 feet. At a distance of 350 feet from the property, milling and chain saw noise levels would be approximately 74 dBA (assuming a 7.5 dBA attenuation factor), which is less than the County noise threshold of 75 dBA and less than the federal noise threshold of 78 dBA. Therefore noise impacts from milling and chain saws to the nearest sensitive receptor, which is located 380 feet from the property, would be less than significant. Any timber harvest work or on-site milling work that would require the use of chain saws and the temporary mill shall be performed between the hours of 7 AM to 7 PM, consistent with the County noise ordinance 8.16.080.

Construction noise associated with the construction of the Proposed Project and chain saw and milling noise associated with the processing of the lumber onsite would therefore be less than the County's noise threshold of 75 dBA, Leq for residential areas. Furthermore, in accordance with County ordinance 8.16.080, all such construction activities associated with the Proposed Project shall occur between the hours of 7 AM to 7 PM. Construction of the Proposed Project would not result in a temporary, significant increase in the ambient noise level or generate noise levels in excess of the County's noise standards; therefore, noise from all such construction activities of the Proposed Project discussed above is a less than significant impact.

Operation. Operation of the Proposed Project generally consists of replanting, pruning,

harvesting, and grape transport. Operational noise would be further reduced with the implementation of the following agricultural activities outlined in **Section 3.0 Project Description**:

- Dry farming techniques, which would reduce or eliminate the noise of water pumps and irrigation;
- Hand farming and no-till planting, which would reduce or eliminate noise from farm equipment; and
- Hand pulling of intrusive weeds and pest management using herbicides, which would be applied via non-motorized means.

Even with implementation of the above reasonable noise reducing activities, the Proposed Project would slightly increase the ambient noise level in the immediate vicinity of the property. However, given the small size of the project, the location of the project (adjacent to an active vineyard), the low-density residential uses in the area, and the County's General Plan Policy CC-35, which states that agriculture and agricultural processing is considered an acceptable and necessary part of the community character of Napa County and is not considered to be undesirable, operational noise impacts would be less than significant.

Mitigation Measure 4.10-1: No mitigation is required.

Impact 4.10.2: The Proposed Project would not expose persons to or generate excessive groundborne vibration noise levels. This impact is less than significant.

Construction. Construction activities for the Proposed Project would consist of using earthmoving equipment shown in **Table 4.10-10**. Generally, excessive vibration is only an issue when construction requiring the use of equipment with high vibration levels (i.e., compactors, large dozers, etc.) occurs within 25 to 100 feet of an existing structure. Several medium-sized dozers, compactors, scrapers and other equipment would be used during construction of the Proposed Project. No pile driving or high vibration level equipment would be used during construction. The nearest noise receptor is a residence, approximately 380 feet from the location of the nearest site of construction activities for the Proposed Project. **Table 4.10-10** provides estimated construction vibration levels at these distances. As shown in **Table 4.10-10**, the predicted PPV levels for all of the equipment to be used in construction of the Proposed Project would be below the significance thresholds of 0.5 PPV for non-residential structures and 0.1 PPV for residences (see **Section 4.10.3-3 Significance Thresholds**). This would be a less than significant impact.

TABLE 4.10-10
PREDICTED PPV AT 75 AND 380 FEET FROM CONSTRUCTION[1]

Equipment	PPV (inches/second) at 75 feet	PPV (inches/second) at 380 feet
Large bulldozer	0.019	0.0020
Excavator	0.019	0.0020
Scraper	0.019	0.0020
Loaded trucks	0.016	0.0017
Small bulldozer	0.001	0.0001

[1]PPV was predicted using the equation PPV predicted = PPVref *(Dref/Dsource)^1.4.
PPV = peak particle velocity
Source: Caltrans, 2004; AES, 2011.

Operation. Loaded trucks traveling to and from the Proposed Property during operation would be the only source of vibrations from the operation of the Proposed Project. Truck usage on local roadways generated by the Proposed Project would increase during harvest season. Loaded trucks may occur as close as 50 feet to sensitive noise receptors. Based on the calculations presented in **Table 4.10-10**, at a 50-foot distance, vibrations from loaded trucks can be 0.029 PPV, which is below the significance threshold of 0.1 PPV for residences (see **Section 4.10.3-3 Significance Thresholds**). Therefore, the additional loaded truck traffic during harvest would not expose sensitive noise receptors to excessive groundborne vibration or groundborne noise levels. This would be a less than significant impact.

Mitigation Measure 4.10-2: No mitigation is required.

Impact 4.10.3: The Proposed Project is not 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 in the vicinity of a private airstrip; therefore, the Proposed Project would not expose people residing or working in the project area to excessive noise levels.

Mitigation Measure 4.10-3: No mitigation is required.

REFERENCES

California Department of Transportation (Caltrans), 2004. Transportation- and Construction-Induced Vibration Guidance Manual, 2004. Available online at: http://www.dot.ca.gov/hq/env/noise/pub/vibrationmanFINAL.pdf. Accessed March 27, 2010.

Caltrans, 2009. Technical Noise Supplement, 2009. Available online at: http://www.dot.ca.gov/hq/env/noise/pub/tens_complete.pdf. Accessed March 28, 2010.

Federal Highway Administration (FHWA), 2006. FHWA Highway Construction Noise Handbook, 2006. Available online at: http://www.fhwa.dot.gov/environment/noise/handbook/index.htm. Accessed November 4, 2011.

FHWA, 2010a. Measurement of Highway-Related Noise, Terminology, 2010. Available online at: http://www.fhwa.dot.gov/environment/noise/measurement/mhrn02.cfm. Viewed on January 11, 2011.

FHWA, 2010b. Highway Traffic Noise: Analysis and Abatement Guidance. Available online at: http://www.fhwa.dot.gov/environment/noise/regulations_and_guidance/analysis_and_abatement_guidance/revguidance.pdf. Viewed on January 11, 2011.

Napa County, 2008. *Napa County General Plan*. Available online at: http://www.countyofnapa.org/GeneralPlan/. Accessed July, 2011.

Noise Publisher Clearinghouse (NPC). Special Report: Is a Quiet Chain Saw an Oxymoron? Available online at: 2004http://www.nonoise.org/library/qz7/QuietChainsaws.pdf. Accessed on April 20, 2012.

4.11 TRANSPORTATION AND CIRCULATION

4.11.1 SETTING

4.11.1-1 EXISTING ROADWAY NETWORK

Access to the property is provided via an existing roadway network. Direct access to the property is provided via Diamond Mountain Road. Roadways that would be utilized by project related traffic are described below.

Diamond Mountain Road is a one-lane east/west oriented roadway that extends from State Route (SR) -29 to the Napa/Sonoma County line where its name then changes to Sharp Road. Diamond Mountain Road is under the jurisdiction of the County of Napa (County). The Diamond Mountain Road and SR-29 intersection to the east of the property is one-way stop controlled. Diamond Mountain Road provides access to the property from SR-29 to the east and Sharp Road to the west.

State Route 29 (SR-29) is a two-lane north/south oriented major roadway that provides regional access to the property. The Napa County General Plan (2008) (General Plan) designates SR-29 as a major non-county roadway through the unincorporated area of the county; SR-29 is also under the jurisdiction of the California Department of Transportation (Caltrans).

4.11.1-2 EXISTING TRAFFIC CONDITIONS

The Highway Capacity Manual (HCM) states that the two-way capacity of an ideal, two-lane, rural highway is 3,200 passenger car units per hour (HCM, 2000). An ideal two-lane rural highway has wide lanes, wide shoulders, and very few access points. In general, narrow lanes, no shoulders, and multiple access points make rural highway travel conditions less ideal and therefore lower the capacity of the roadway. For example, the existing peak hour traffic volume on Diamond Mountain Road is four trips per hour in each direction (Napa County, 2009). However, Diamond Mountain Road would not be considered an ideal rural highway that could accommodate 3,200 passenger car units per hour since the road is characterized as one-lane, narrow, steep, and windy with no shoulders. For this reason, logging trucks will not be used under the Proposed Project; instead, the harvested timber will be milled onsite and lumber will be transported from the property on legally loaded, three-axle trucks (refer to **Section 3.0 Project Description**).

As noted in the Timber Harvest Plan (THP) (Appendix E of **Appendix K**) for the Proposed Project, Diamond Mountain Road, SR-29, and roads in the surrounding area have historically and are currently being used for the transport of agricultural crops by a wide variety of

landowners in the County. Many of the roads in the surrounding area were originally built to transport agricultural products, including forest products and grapes, early in the last century.

4.11.1-2 BIKEWAYS, PEDESTRIAN FACILITIES, PUBLIC TRANSPORTATION SYSTEMS

There are no bicycle pathways/routes in the immediate vicinity of the property. There are no pedestrian facilities within the vicinity of the property. There is no public transportation that serves the property.

4.11.2 REGULATORY FRAMEWORK

4.11.2-1 STATE

California Department of Transportation

Caltrans manages interregional transportation, including the management and construction of the state highway system. In addition, Caltrans is responsible for the permitting and regulation of state roadways. Caltrans establishes performance standards that apply to specific routes and publishes those standards in transportation concept reports. There is one roadway that falls under Caltrans' jurisdiction, SR-29, which occurs to the east of the Proposed Project.

4.11.2-2 LOCAL

Napa County General Plan (2008)

The Napa County General Plan (2008) seeks to provide safe and efficient movement on well-maintained roads throughout the County. The following are related goals and policy guidelines that pertain to transportation and circulation:

Goal CIR-2: The County's transportation system shall provide for safe and efficient movement on well-maintained roads throughout the County, meeting the needs of Napa County residents, businesses, employees, visitors, special needs populations, and the elderly.

Policy CIR-13: The County seeks to provide a roadway system that maintains current roadway capacities in most locations and is both safe and efficient in terms of providing local access. The following list of improvements has been supported by policy makers within the County and all five incorporated cities/town, and will be implemented over time by the County and other agencies to the extent that improvements continue to enjoy political support and funding becomes available:

Countywide

- Install safety improvements on rural roads and highways throughout the county including but not limited to new signals, roundabouts, bike lanes, shoulder widening, softening sharp curves, etc.

Policy CIR-15: The County shall maintain and apply consistent highway access standards regarding new driveways to minimize interference with through traffic while providing adequate local access. The County shall also maintain and apply consistent standards (though not exceeding public road standards) regarding road widths, turn lanes, and other improvements required in association with new development. Application of these standards shall consider the level of improvements on contiguous roads.

Policy CIR-16: The County shall seek to maintain an adequate Level of Service (LOS) on roads and at intersections as follows. The desired level of service shall be measured at peak hours on weekdays.

- The County shall seek to maintain an arterial LOS D or better on all county roadways, except where maintaining this desired level of service would require the installation of more travel lanes than shown on the Circulation Map.
- The County shall seek to maintain a LOS D or better at all signalized intersections, except where the level of service already exceeds this standard (i.e., LOS E or F) and where increased intersection capacity is not feasible without substantial additional right-of-way.
- No single level of service standard is appropriate for un-signalized intersections, which shall be evaluated on a case-by-case basis to determine if signal warrants are met.

4.11.3 IMPACTS ANALYSIS

4.11.3-1 SIGNIFICANCE CRITERIA

Criteria for determining the significance of impacts to traffic and circulation have been developed based on Appendix G of the California Environmental Quality Act's (CEQA) *Guidelines* and relevant agency guidelines. Impacts to the existing transportation network would be considered significant if the Proposed Project would:

- 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);
- Exceed, either individually or cumulatively, a level of service standard established by the county congestion management agency for designated roads or highways (LOS D in Napa County);
- Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks;
- Substantially increase hazards 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, bicycle racks).

4.11.3-2 IMPACTS AND MITIGATION MEASURES

Impact 4.11-1: Construction of the Proposed Project would temporarily increase traffic volumes on roadways in the area; however, the increase in traffic would not be substantial and a less than significant impact would result.

Construction. Construction of the Proposed Project would generate vehicle and truck trips traveling to and from the property. Trips would result from construction workers and trucks delivering heavy equipment and materials to the project site. Equipment would stay onsite for the duration of each construction season. Vehicles expected to be used during construction include (but are not limited to): legally loaded, three-axle trucks; dump trucks; delivery trucks; and construction worker vehicles. Diamond Mountain Road is the primary access roadway for all traffic entering and exiting the property.

Construction activities would be intermittent and short-term in nature. As stated in **Section 3.0**, construction of the Proposed Project is anticipated to occur over two years, with construction occurring only during the dry months. The typical construction hours would be 7 A.M. to 5 P.M. Monday through Friday. Sufficient equipment, labor, and materials would be committed and transported to the property prior to the commencement of construction to complete construction during each season. Once equipment is transported to the property it would remain there until implementation during that season is complete.

Construction Operating Window

The timber harvest and post-harvest site stabilization and initial erosion control under the ECP is anticipated to occur in the first year of construction. Most of the actual vineyard installation and planting will occur in the second year of construction. Construction workers will average about three workers during each phase of the project including the precursor THP phase, the installation of the ECP features, and the planting and operation of the vineyard. **Table 4.11-1** shows the estimated vehicle trips and construction operating window associated with the timber harvest, ECP installation, and vineyard installation.

TABLE 4.11-1
ESTIMATED VEHICLE TRIPS AND CONSTRUCTION SCHEDULE

Precursor Action: Timber Harvest	
I. Vehicle Trips	**Duration/Amount**
Heavy Equipment Transport	12 trips (Maximum per year)
Material Deliveries	Up to 12**
Personnel	120 trips per year*** (Twice daily for approx. 3 months*)
II. Construction Operating Window	**May 15 – November 15**
Proposed Project: Erosion Control Plan Installation	
I. Vehicle Trips	**Duration/Amount**
Heavy Equipment Transport	8 trips (Maximum per year)
Material Deliveries	Up to 20**
Personnel	80 trips per year*** (Twice daily for approx. 2 months*)
II. Construction Operating Window	**May 15 – October 15**
Proposed Project: Vineyard Installation	
I. Vehicle Trips	**Duration/Amount**
Heavy Equipment Transport	8 trips (Maximum per year)
Material Deliveries	Up to 40**
Personnel	120 trips per year*** (Twice daily for approx. 3 months*)
II. Construction Operating Window	**May 15 – October 15**

Notes:
* Based on 20 days per month work schedule.
** Material Deliveries include materials necessary for the operation and installation of the THP, ECP and Vineyard such as culverts, straw, drip irrigation, vines etc.
*** Assumes car pooling, 3 persons per vehicle.
Source: Environmental Resource Management, 2011

Construction Year 1: Timber Harvest and Site Stabilization under the ECP

In summary, the greatest number of materials/heavy equipment deliveries and worker trips would occur during the first year of construction, during the timber harvest and post-harvest site stabilization per the ECP. It should be noted that the estimated number of trips associated with the ECP installation for the Proposed Project (as shown in **Table 4.11-1**) would be divided over the two year construction period, since post-harvest site stabilization measures would be constructed subsequent the timber harvest and specific erosion control devices for the vineyard would be installed according to vineyard development during the second year of construction.

Based on **Table 4.11-1**, an estimated total of 52 materials/heavy equipment deliveries would occur over a seven month period (May 15 – November 15) during both the timber harvest and initial ECP installation phases. This is roughly equivalent to two materials/heavy equipment deliveries on average per week during the seven month construction window. These

materials/heavy equipment deliveries would be scheduled during non-peak hours. Additionally, during the first construction year, worker trips anticipated to support the timber harvest and initial ECP installation phases (approximately four daily trips combined) are estimated to total approximately 20 trips per week (Monday – Friday) within the two to three month operating window noted in **Table 4.11-1**. It should be noted that the number of worker trips in **Table 4-1** is based on an estimate of carpooling for up to three workers, so worker trip totals represent a general approximation. Worker trips are anticipated to occur during peak A.M. and P.M. hours. Combined, the total traffic during the seven month construction window for the first year of construction would be roughly equivalent to 22 trips generated per week, including materials/heavy equipment deliveries (2 trips) and worker trips (20 trips).

Construction Year 2: ECP and Vineyard Installation

As compared to the first year of construction of the Proposed Project, the second year of construction would generate fewer project-related trips as the timber harvest phase and initial site stabilization phase of the ECP for the project would be complete. For the vineyard installation during the second year of construction, an estimated total of 48 materials/heavy equipment deliveries would occur during the six month construction window (May 15 – October 15), which is roughly equivalent to two deliveries per week (refer to **Table 4.11-1**). Additionally, during this period approximately 10 worker trips per week (Monday – Friday) would be generated to support the vineyard installation activities (refer to **Table 4.11-1**). It should be noted that additional trips would occur for the finalization of the ECP installation during the second year of construction; however for the purposes of this analysis, the estimated trip totals for the ECP installation phase were included under *Construction Year 1: Timber Harvest and Site Stabilization under the ECP* above.

Combined, the total traffic during the six month construction window for the second year of construction (not including follow-up trips for the finalization of the onsite ECP measures) would be roughly equivalent to 12 trips generated per week, including materials/heavy equipment deliveries (2 trips) and worker trips (10 trips).

Findings

As noted above, the first year of construction of the Proposed Project would generate roughly 22 combined trips for materials/heavy equipment deliveries and worker trips per week during the seven month construction window. During the second year of construction, the total number of combined trips per week for materials/heavy equipment deliveries and worker trips would be approximately 12 trips during the six month construction window. Based on these estimates, the temporary increase in project-related trips during the first and second years of construction of the Proposed Project would not result in a substantial increase in traffic volumes on roadways accessing the property and in the vicinity.

As stated above, the existing peak hour traffic volume on Diamond Mountain Road is four trips per hour in each direction (Napa County, 2009). Since this data represents the most current data available from the County, the four trips per hour during the peak hour will be used to estimate daily traffic flow on Diamond Mountain Road during a typical eight hour work day. In general, four existing trips per hour is roughly equivalent to an average of 32 existing daily trips during an eight hour timeframe or 160 trips per week (Monday – Friday) during this same daily timeframe. As shown above, trip estimates during construction of the Proposed Project indicate that the addition of 22 combined trips per week during the first year of construction and 12 combined trips per week during the second year of construction would result in a temporary increase of 13.75 percent for the first year and 7.5 percent for the second year of construction on existing daily traffic conditions on Diamond Mountain Road. This minimal and temporary increase in traffic would not result in impacts to the LOS experienced by motorists on Diamond Mountain Road as it would not be anticipated to change significantly.

Project-related trips on Diamond Mountain Road would also apply to SR-29, which provides regional access to the area. Currently, in the vicinity of its intersection with Diamond Mountain Road, SR-29 is considered to have a LOS B (PMC, 2007). LOS B is described as having stable operating conditions, but the presence of other road users causes a noticeable, though slight, reduction in comfort, convenience, and maneuvering freedom (PMC, 2007). The maximum daily traffic volume for a rural two-lane arterial such as SR-29 with a LOS B is 5,300 passenger car units. The increase of an estimated 22 combined trips per week (Monday – Friday) during the first year of construction and 12 combined trips per week (Monday – Friday) during the second year of construction constitutes approximately 0.1 percent of the existing maximum daily traffic volume on SR-29. Therefore, the Proposed Project would not adverse impact the LOS on SR-29. In addition, this project-related increase in traffic volume would be temporary and seasonal.

Therefore, the potential impact to local traffic conditions as a result of project-related trips during construction would be less than significant.

Operation. Operation of the Proposed Project would generate trips on account of vineyard maintenance and grape harvest. Operational traffic associated with the Proposed Project would be greatest during harvest of the vineyard. During operation of the Proposed Project, grape harvest will be transported in farm trucks to wineries in the Napa Valley area. The grape harvest is expected to transport 50± tons annually over local roads using farm trucks (Appendix E of **Appendix K**). Grape harvest activities under the Proposed Project are anticipated to generate 30 trips per year. This type of agricultural traffic anticipated to be generated by the Proposed Project would be minimal and very similar to other agricultural transport activities (i.e. grapes, cattle, sheep, horses, apples, rock aggregates, fire wood, etc.) presently taking place on local roadways in the vicinity of the Proposed Project (Appendix E of **Appendix K**).

In summary, this long-term addition of operational trips to Diamond Mountain Road would be minimal, seasonal, and would not exceed capacity on existing roadways serving the property and in the vicinity. Consistent with **Section 3.0 Project Description**, no logging trucks would be used under the Proposed Project. Therefore, operation of the Proposed Project would result in a less than significant impact to area circulation.

Mitigation Measure 4.11-1: No mitigation is required.

Impact 4.11-2: Construction and operational traffic generated by the Proposed Project has the potential to result in inadequate emergency access.

The property's only access point (including emergency access) is from an existing onsite road in the northwestern corner, which connects to Diamond Mountain Road and then to SR-29. As discussed under **Impact 4.11-1**, since the level of temporary construction traffic is minimal and there is a very low increase in long-term traffic volumes associated with the addition of worker trips for operation of the vineyard, these factors would not change the LOS experienced by fire and emergency services in accessing the property.

Additionally it should be noted, as stated in the Timber Conversion Plan (TCP) (Appendix E of **Appendix K**), the general area in which the Proposed Project is located is an at-risk area for wildfires. Forest fires have destructively burned over the area in the past. Access for firefighting resources in the area is generally poor. Access for firefighting equipment to the property is limited to Diamond Mountain Road, which is a one-lane, narrow, winding road. Fuel loading is moderate to high in the vicinity of the property. Some of the vegetation types present in the surrounding area are broken and discontinuous. However, installation of the proposed vineyard will further reduce fire susceptibility by breaking up some of the overstory fuels in the existing forest canopy, providing a less fire-sensitive irrigated agricultural crop than the existing use, and by providing an onsite water source for professional fire fighters (Appendix E of **Appendix K**). Thus, the TCP concludes that potential demands on fire services and emergency access would be reduced with the completion of the Proposed Project (Appendix E of **Appendix K**).

Therefore, because the Proposed Project would not result in inadequate emergency access, this impact is less than significant.

Mitigation Measure 4.11-2: No mitigation is required.

Impact 4.11-3: Traffic generated by construction and operation of the Proposed Project has the potential to impact pedestrian, bicycle, and public transport in the vicinity of the project.

There are no pedestrian or public transportation facilities in the vicinity of the Proposed Project. Also, the Proposed Project would not create a need for such a facility in the vicinity of the property. Although there are no designated bicycle facilities in the vicinity of the project, some bicycles operate along Diamond Mountain Road. Construction and operation of the Proposed Project would generate a small amount of project-related construction and operational traffic on Diamond Mountain Road (refer to **Impact 4.11-1**). However, the Proposed Project is not anticipated to affect bicycle transportation given the temporary and minimal project-related traffic that would be added to Diamond Mountain Road.

For the reasons discussed above, a less than significant impact would occur to bicycle, public transportation, and pedestrian facilities from implementation of the Proposed Project.

Mitigation Measure 4.11-3: No mitigation is required.

REFERENCES

Highway Capacity Manual (HCM), 2000. Highway Capacity Manual. Transportation Research Board. Washington D.C.

Napa County, 2008. Napa County General Plan. June 2, 2008. Available online at: http://www.co.napa.ca.us/GOV/Departments/DeptDocs.asp?DID=8&T=68&V=0&od=0.

Napa County, 2009. Napa County Department of Public Works – Traffic Volumes. Segment: Diamond Mountain Road west of south fork Diamond Mountain Road. September 22, 2009.

PMC, 2007. Draft Environmental Impact Report for the Napa County General Plan. Prepared for Napa County. February, 2007. Available online at: http://www.countyofnapa.org/Pages/DepartmentDocuments.aspx?id=4294967660.

SECTION 5.0

ALTERNATIVES TO THE PROPOSED PROJECT

5.1 INTRODUCTION

This chapter reviews alternatives to the Proposed Project considered during the preparation of this EIR. The purpose of the alternative analysis, according to the California Environmental Quality Act (CEQA) *Guidelines* Section 15126.6(a), is to describe a range of reasonable alternative projects that could feasibly attain most of the objectives of the Proposed Project and to evaluate the comparative merits of the alternatives. CEQA *Guidelines* Section 15126.6(b) requires consideration of alternatives that could reduce to a less than significant level or eliminate any significant adverse environmental effects of the Proposed Project, including alternatives that may be more costly or could otherwise impede the Proposed Project's objectives. The range of alternatives evaluated in an EIR is governed by a "rule of reason," which requires the evaluation of alternatives "necessary to permit a reasoned choice." Alternatives considered must include those that offer substantial environmental advantages over the Proposed Project and may be feasibly accomplished in a successful manner considering economic, environmental, social, technological, and legal factors. An EIR does not need to consider every possible alternative, but must consider alternatives that will foster informed decision-making and public participation.

In accordance with the CEQA *Guidelines*, the alternatives considered in this EIR include those that 1) could accomplish most of the basic objectives of the project, and 2) could avoid or substantially lessen one or more of the significant effects of the project. To provide the appropriate context for this alternatives analysis, the Proposed Project objectives and key significant effects are summarized below in **Section 5.2**. Project alternatives determined to achieve the CEQA selection criteria are discussed in **Section 5.3**. This discussion evaluates the capacity of selected project alternatives to accomplish the basic objectives of the project and provides a comparison of the potential environmental impacts expected to occur for each resource area. These comparisons are used in **Section 5.4** to determine the Environmentally Superior Alternative.

5.2 PROJECT OBJECTIVES

Approximately 14± acres of timberland would be harvested on the property under a Timber Harvest Plan (THP) and Timber Conversion Plan (TCP), consistent with Forest Practice Rules, and performed under a CEQA-equivalent process lead by the California Department of Forestry and Fire Protection (Cal Fire). The timber harvest would occur before the installation of the onsite erosion control plan (ECP) and vineyard conversion elements of the Proposed Project, which are the components of the project that trigger the preparation of this EIR under CEQA.

After the timber harvest occurs on the property, specific objectives associated with the Proposed Project are to:

- Convert 13.5± acres on the property within the 14± acre harvest area of the THP to other permanent uses;
- Install a 16.3± acre erosion control plan (ECP) on the property, which includes the harvested 14± acre area, improvements to an existing onsite road (1.3± acres), and remaining areas such as farm avenues for the vineyard;
- Develop a 12± acre biodynamic vineyard within the 13.5± acre converted area of the property; and
- Provide opportunities for vineyard employment and economic development in Napa County.

Sustainable project practices include:

- Farm vineyards in a sustainable manner under Biodynamic certification standards by Demeter, USA;
- Minimize soil erosion of vineyard development and operation through vineyard design that avoids erosion-prone areas and controls erosion within the vineyard rather than capturing soil after it has been displaced;
- Protect water quality by protecting existing wetlands and streams to the maximum extent feasible through avoidance, buffers, and the implementation of various drainage features;
- Make efficient use of water resources from an onsite spring to the degree needed to establish the vineyard, which would ultimately be dry farmed in the long term; and
- Preserve a large portion of the property (57 percent), which would remain as timber/woodlands and open space and as such these areas would have the greatest wildlife habitat value (refer to the County Conservation Regulations 48 and 50 described in the THP, **Appendix K**).

5.2.1 KEY IMPACTS OF THE PROPOSED PROJECT

Key impacts of the Proposed Project are evaluated in **Section 4.0** of this EIR. Project design, regulatory requirements, and recommended mitigation measures would reduce all potential short- and long-term potential impacts during construction and operation of the Proposed Project to a less than significant level. There are no significant and unavoidable impacts associated with the Proposed Project.

5.3 ALTERNATIVES TO THE PROPOSED PROJECT

5.3.1 NO PROJECT ALTERNATIVE

Description

As required by CEQA *Guidelines* Section 15126.6(e), a No Project Alternative has been evaluated. The evaluation of the No Project Alternative allows decision makers to compare the impacts of the Proposed Project against no development of the project. According to the CEQA *Guidelines* Section 15126.6(e)(2), the No Project Alternative shall discuss what would reasonably be expected to occur in the foreseeable future if the project were not approved. Thus, the No Project/No Development Alternative consists of the environmental conditions that currently exist with no future development on the property. The property would remain as currently described in the existing setting under each issue area discussed in **Section 4.0**.

Ability to Meet Project Objectives

With the No Project Alternative, the property would continue to remain in its existing state as partially forested with small areas of open, non-native grassland and a remnant orchard. No changes to the existing forested areas, access road or open space areas would occur. No conversion of the property to non-timber uses would occur. The trees and vegetation cover proposed for removal through the timber harvest would remain unaffected. This alternative would not accomplish the basic objectives of the Proposed Project. The economic objectives of the timber harvest and vineyard conversion, including the sustainable operation of the proposed biodynamic vineyard would not be achieved through this alternative.

Summary of Environmental Impacts

This alternative would eliminate short-term impacts related to construction activities. Temporary impacts associated with noise, pollutant, and greenhouse gas (GHG) emissions from construction activities would be avoided. Additionally, because ground-disturbing activities would not occur, potential impacts to hydrology and water quality associated with the Proposed Project as well as impacts to biological and cultural resources would also be avoided. However, the current road into the property would not be improved as part of the ECP and therefore siltation from this source would continue under the No Project Alternative. This siltation would continue to impact the water quality of the Napa River watershed which is currently listed as a 303(d) stream for siltation impacts.

The development of project features associated with the timber harvest, installation of the ECP, and vineyard conversion would not occur under this alternative. The impacts identified in **Section 4.0** would be avoided and the existing environmental setting would remain.

Overview of the No Project Alternative

The No Project Alternative would not meet the objectives of the Proposed Project. It would not result in any actions on the ground including the improvement of the existing onsite road under the ECP. This would result in continued ongoing impacts to water quality and would not produce any economic benefits for Napa County or the state.

5.3.2 REDUCTION OF OAK WOODLAND IMPACTS AND MANAGEMENT ALTERNATIVE

Description

Under the Reduction of Oak Woodland Impacts and Management Alternative, sensitive oak woodland habitat on the property would be avoided from development and no management or enhancement activities would occur to the onsite oak woodland. Similar to the Proposed Project, 12± acres of vineyard would be developed following a harvest of approximately 14± acres of timberland on the property under this alternative. However, the site plan for the proposed vineyard would be re-designed to avoid all oak woodland habitat on the property. Instead, the vineyard acreage would be developed in other areas of the property. Under this alternative, the net vineyard acres removed from the northwestern portion of the property (where the oak woodland is located) would be developed on slopes ranging from approximately 30 to 35 percent near the southwestern and southeastern corners of the property. This alternative would also require the ECP to be re-designed. Since the oak woodland habitat onsite would be completely avoided, no management or enhancement activities would take place within these areas. The objective of the Reduction of Oak Woodland Impacts and Management Alternative is to reduce short-term impacts to Black Oak Woodland identified on the property (refer to **Figure 4.3-1**).

Ability to Meet Project Objectives

The Reduction of Oak Woodland Impacts and Management Alternative would meet the objectives of the project but would result in no long-term management of oak woodland onsite and could cause an increase in erosion and sedimentation in on- and off-site watercourses due to the re-arrangement of the proposed vineyard blocks to steep slopes on the property.

Summary of Environmental Impacts

Under the Reduction of Oak Woodland Impacts and Management Alternative, short-term impacts to oak woodland onsite from development of the project would not occur and the oak woodland habitat would remain in its present condition. As stated in **Section 4.3**, the Black Oak Woodland onsite intergrades with Douglas Fir Forest along its margins, especially on ridges where the slopes gain a southern trend. In many areas onsite, Douglas Fir saplings are becoming dominant in the understory of the Black Oak Woodland. This recruitment of Douglas Fir in the oak woodland could be a natural forest succession trend or resultant from past logging and other disturbances onsite (**Section 4.3**).

Methods to enhance the quality of the protected oak woodland onsite, which are included under the Proposed Project, such as the selective cutting of Douglas Fir less than four inches diameter at breast height (dbh) and removal of invasive understory broom species, would not occur under this alternative and so there would be no long-term management or enhancement of the oak woodland habitat onsite (refer to **Mitigation Measure 4.3-1**; **Section 4.3**). As a result, the Douglas Fir saplings present within the oak woodland onsite would likely overtake the oak woodland habitat and become the dominant species. This would reduce oak woodland habitat and would likely lead to a Douglas Fir forest in the long term. This succession of Douglas Fir would also reduce the oak woodland habitat for use by wildlife species.

Re-design of the ECP would be necessary under the Reduction of Oak Woodland Impacts and Management Alternative. Since the ECP for the Proposed Project has been specifically designed to limit development on steep slopes, be set back from onsite water courses, and be beneficial by significantly reducing on- and off-site erosion and sedimentation from current conditions, these environmentally beneficial factors would not likely be possible to be employed under this alternative.

Re-arrangement of the proposed vineyard blocks on steep slopes in the southwestern and southeastern corners of the property would result in an increase in erosion and sedimentation levels; such impacts would require greater mitigation to reduce impacts to be equal to or less than pre-project conditions. Additional County permitting would also be required for the proposed erosion control plan on slopes greater than 30 percent.

Additionally, re-arrangement of the 12± acres of proposed vineyard onsite would require greater vineyard acreage to be located upslope from the spring and southeastern Class III drainage on the southern portion of the property. Re-design of the ECP would be required to address the potential for increased levels of sediment to flow downstream and directly affect these onsite water features or other off-site watercourses, such as the Napa River, which is currently listed as an impaired water body for nutrients, pathogens, and sediment under Section 303 (d) of the Clean Water Act (CWA) (**Section 4.8**). This would be a potentially significant impact that would need to be addressed for this alternative.

With the Reduction of Oak Woodland Impacts and Management Alternative (like the Proposed Project), construction-related dust and particulate matter would be generated, additional vehicles would travel to the property during project construction and operation (as compared to current conditions), and noise would be generated. These impacts were analyzed for the Proposed Project to be less than significant (refer to **Sections 4.2**, **4.10**, and **4.11**); therefore, due to the similar acreage of the Reduction of Oak Woodland Impacts and Management Alternative (12± acres), these impacts would be considered similar to those of the Proposed Project. Further, for the Reduction of Oak Woodland Impacts and Management Alternative, the mitigation measure required to lessen impacts to air quality would be the same as **Mitigation Measure 4.2-1** under the Proposed Project.

Similar to the Proposed Project, the Reduction of Oak Woodland Impacts and Management Alternative would result in the potential to affect previously unknown cultural resources, and could result in the discovery and disturbance of unknown human remains. The mitigation measures included in the Proposed Project (**Mitigation Measures 4.4-1**, **4.4-2**, and **4.4-3**) would be required for the Reduction of Oak Woodland Impacts and Management Alternative to minimize potential impacts to cultural resources.

Like the Proposed Project, the Reduction of Oak Woodland Impacts and Management Alternative would not result in long term transportation and traffic impacts. In comparison, the impacts that would occur under this alternative would be similar to the less than significant impacts to transportation and circulation of the Proposed Project (see **Section 4.11**).

Overview of the Reduction of Oak Woodland Impacts and Mitigation Alternative

The Reduction of Oak Woodland Impacts and Management Alternative would constitute 12± acres of vineyard, similar to the Proposed Project, but would be re-arranged to include development of vineyard on steep slopes near the southwestern and southeastern corners of the property. Since the Reduction of Oak Woodland Impacts and Management Alternative would reduce short-term impacts to Black Oak Woodland onsite, impacts to this sensitive habitat would be less than those of the Proposed Project. However, unlike the Proposed Project, this alternative would not include required enhancement for the onsite

oak woodland; therefore, long term impacts to oak woodland habitat onsite would be greater than the Proposed Project since species like Douglas Fir would likely outcompete the oaks onsite over time to become the dominant forest cover type.

Impacts to hydrology and water quality as well as geology and soils would be greater than the Proposed Project under the Reduction of Oak Woodland Impacts and Management Alternative since re-arrangement of the proposed vineyard blocks would include steep slopes and therefore would require a complete re-design of the ECP. Since the Proposed Project was specifically designed to accommodate the onsite topography and onsite water features and would result in a significant reduction in pre-project sedimentation conditions upon development of the project ECP, re-design of the ECP would likely increase impacts to these features as compared to the significantly reduced impacts to hydrology and water quality as well as geology and soils under the current ECP and Proposed Project.

5.4 ALTERNATIVES ELIMINATED FROM CONSIDERATION

5.4.1 SELECTIVE TIMBER HARVEST ALTERNATIVE

Description

For the Selective Timber Harvest Alternative, timber would be harvested for the entire allowable portions of the 38-acre property, and subsequently seedlings would be planted. No vineyard development would occur on the property; for this reason, this alternative has been removed from further consideration. Since the timber harvest area is designed to accommodate the vineyard conversion under the Proposed Project, under the Selective Timber Harvest Alternative, a larger timber harvest area would likely occur. Apart from the existing developed areas (i.e. former home site and outbuildings) and onsite streams, wet area, and spring, nearly the entire 38-acre property would be selectively harvested for timber products and replanted for future timber harvest operations.

Ability to Meet Project Objectives

The Selective Timber Harvest Alternative would not fully meet the objectives of the project for the development of a vineyard. The harvest of timber over a larger portion of the property would provide short term economic benefits in the form of increased marketable timber products. However, it would take roughly 20 to 40 years before another timber harvest would be feasible given the size of the trees, or economically viable given the costs for harvesting operations and the sale of timber products. Likewise, the economic tax benefits to the County and the addition of jobs to the local workforce would be significantly reduced under this alternative as there would be no ongoing work force needed for the vineyard operations. The development of the biodynamic vineyard is the central objective of the project, one that will provide the greatest economic returns in the long term while also operating in a sustainable, environmentally sensitive manner.

Summary of Environmental Impacts

Impacts to biological resources under the Selective Timber Harvest Alternative would include greater impacts, at least in the short term, to Douglas fir, Coast Redwood Forest, Black Oak Woodland, and northern spotted owl nesting/roosting and foraging habitat than those of the Proposed Project. Similar to the Proposed Project, the recommended mitigation measures to reduce impacts to these resources would be applied in appropriate ratios to the actual acreage of woodland and northern spotted owl habitat impacted (refer to **Section 4.3**).

Impacts to the onsite wildlife movement corridors and habitat would be temporarily impacted during the operation of the timber harvest and replanting activities. Also, no deer fencing would be installed. However, reduced vegetation cover over a greater acreage of the property under this alternative could impact foraging and cover habitat for many terrestrial and bird species during the forest re-growth period.

The selective timber harvest and corresponding Timber Harvest Plan (THP) would be implemented pursuant to California Department of Forestry and Fire Protection (Cal Fire) standards. The Napa County ECP regulations would not apply under this alternative. The mitigation measures contained in the Proposed Project's ECP are significantly greater than those found in a THP. As such, the Selective Timber Harvest Alternative would result in more extensive impacts in terms of total acreage and would have the potential for greater impacts to hydrology and water quality as well as geology and soils.

The disturbance to the forest associated with the Selective Timber Harvest Alternative would cause ground disturbing activities over a greater total acreage than those anticipated and mitigated for in the Proposed Project. During timber harvest activities, potential impacts to resource areas such as hydrology and water quality, biological resources, noise, and air quality would likely be greater than those associated with and mitigated for in the Proposed Project. However, the THP process would require mitigation measures to lessen or eliminate these potential impacts.

Overview of Selective Timber Harvest Alternative

The Selective Timber Harvest Alternative would impact a greater total acreage of the property. This alternative would cause greater, although mainly short-term, impacts. The economic returns of the timber harvest would be short term and limited to the initial harvest instead of the ongoing economic benefit of vineyard operations under the Proposed Project. Under the present regulatory environment and costs associated with timber harvest permits, it is highly probable that no net return would occur as a result of only a selective timber harvest on the property. Furthermore, this alternative fails to meet the objective of the project, to develop a Biodynamic vineyard, and is therefore eliminated from further consideration in this EIR.

5.5 ENVIRONMENTALLY SUPERIOR ALTERNATIVE

CEQA *Guidelines* Section 15126.6(d) requires an evaluation of alternatives to the Proposed Project.

> *"The EIR shall include sufficient information about each alternative to allow meaningful evaluation, analysis, and comparison with the proposed project. A matrix displaying the major characteristics and significant environmental effects of each alternative may be used to summarize the comparison. If an alternative would cause one or more significant effects in addition to those that would be caused by the project as proposed, the significant effects of the alternative shall be discussed, but in less detail than the significant effects of the project as proposed."*

Consistent with this CEQA requirement, a summary matrix has been prepared which qualitatively compares the effectiveness of each of the alternatives in reducing environmental impacts. This matrix, presented in **Table 5-1**, identifies for each impact area whether the alternatives would have greater, lesser, or similar impacts compared with the Proposed Project. As stated above in **Section 5.2.1**, there would be no significant and unavoidable impacts as a result of the Proposed Project. Each of the impacts identified under the Proposed Project would be considered less than significant after mitigation. Therefore "greater" and "lesser" impacts identified in **Table 5-1** are referring to varying degrees of impacts below established significance thresholds. In summary, the environmentally superior alternative is the alternative that would cause the least impact to the biological and physical environment.

TABLE 5-1
ENVIRONMENTAL IMPACT COMPARISON
BETWEEN THE PROPOSED PROJECT AND PROJECT ALTERNATIVES

Impact Area	Project Alternatives	
	No Project Alternative	Reduction of Oak Woodland Impacts and Management Alternative
Agriculture and Forestry Resources	Lesser	Similar
Air Quality	Lesser	Similar
Biological Resources	Lesser	Greater
Cultural Resources	Lesser	Similar
Geology and Soils	Lesser	Similar
Greenhouse Gas Emissions	Lesser	Similar
Hazards and Hazardous Materials	Lesser	Similar
Hydrology and Water Quality	Greater	Greater
Land Use/Planning	Similar	Similar
Noise	Lesser	Similar
Transportation and Traffic	Lesser	Similar

Source: AES, 2011

As discussed above, implementation of the No Project Alternative would result in no change in land use on the property; however, it fails to meet the objectives of the project. Under the No Project Alternative, impacts to hydrology and water quality as well as geology and soils would likely be greater than the Proposed Project since the entry road on the property would not be improved. Therefore, the current erosion and sedimentation occurring from this source would continue. Additionally, the segment of the existing road that crosses through the center of the property would not be removed and converted to vineyard under the No Project Alternative. This portion of the road would continue to be a source of erosion and sediment and would not be improved. Without implementation of the ECP, the water quality of onsite and off-site watercourses would not be improved. This could lead to greater impacts to water quality in the long term for off-site watercourses such as the Napa River, which is currently listed as a Section 303 (d) impaired water body under the CWA.

The Reduction of Oak Woodland Impacts and Management Alternative would result in similar impacts as those of the Proposed Project, specifically for the timber harvest operations, installation of the ECP measures, installation of the vineyard, as well as

operation of the vineyard. The Reduction of Oak Woodland Impacts and Management Alternative would eliminate short-term impacts to oak woodland; however, greater impacts would occur over the long term to oak woodland since no enhancement activities would take place to improve the onsite oak woodland habitat, This alternative would also require the re-design of the ECP and implementation of mitigation measures (in relative proportion to the re-assessment of actual impacts), which could result in significant impacts to hydrology and water quality as well as geology and soils as compared to the Proposed Project. Overall, the Reduction of Oak Woodland Impacts and Management Alternative would likely result in similar environmental impacts as those of the Proposed Project; however, since the Proposed Project was specifically designed to accommodate the onsite topography and onsite water features, re-design of the ECP would likely increase impacts to these areas as compared to the Proposed Project.

Generally, the environmentally superior alternative is the alternative that would cause the least damage to the biological and physical environment. Since implementation of the No Project Alternative would result in fewer adverse environmental effects than would occur under the Proposed Project and the Reduction of Oak Woodland Impacts and Management Alternative, the No Project Alternative would be considered the environmentally superior alternative. However, the No Project Alternative would not achieve any of the project objectives and, as stated above, this alternative could lead to greater impacts to hydrology and water quality in the long term.

If the No Project Alternative is the environmentally superior alternative, CEQA *Guidelines* Section 1526.6(e)(2) requires identification of an environmentally superior alternative among the other alternatives considered in the EIR. When comparing the remaining development alternatives, the Proposed Project is the most environmentally superior alternative. The Proposed Project is the only alternative which fully meets the project objectives and has been designed to lessen impacts to the environment to less than significant levels through implementation of the recommended mitigation measures provided in **Section 4.0**.

SECTION 6.0

OTHER CEQA-REQUIRED SECTIONS

California Environmental Quality Act (CEQA)-required discussions are presented in this section, including:

- Indirect and Growth-inducing impacts of the Proposed Project;
- Cumulative Impacts of the Proposed Project;
- Unavoidable Significant Impacts of the Proposed Project (i.e., residually significant impacts); and
- Irreversible Changes.

6.1 INDIRECT AND GROWTH INDUCING IMPACTS

CEQA *Guidelines* Section 15126.2 [d] requires that an EIR evaluate the growth inducing impacts of a proposed project. A growth inducing impact is defined by the CEQA *Guidelines* as an impact that fosters economic or population growth, or the construction of additional housing, either directly or indirectly. Direct growth inducement would result, for example, if a project involved the construction of new housing. Indirect growth inducement would result if a project established substantial new permanent employment opportunities (e.g., new commercial, industrial, or governmental enterprises) or if it would remove obstacles to population growth (e.g., expansion of a wastewater treatment plant that could allow more construction in the service area).

Growth inducement may constitute an adverse impact if the growth is not consistent with or accommodated by the land use plans and growth management plans and policies for the area affected. Local land use plans provide development patterns and growth policies that guide orderly development supported by adequate public services, such as water supply, roadway infrastructure, sewer services, and solid waste services. A project that would induce “disorderly” growth (i.e., conflict with the local land use plans) could directly or indirectly cause additional adverse environmental impacts and other public services impacts. An example of this would be the re-designation of property planned for agricultural uses to urban uses, possibly resulting in the development of services and facilities that encourage the transition of additional land in the vicinity to more intense urban uses. Another example would be the extension of urban services to a non-urban site, thereby encouraging conversion of non-urban lands to urban lands.

As described in **Section 3.0**, the Proposed Project would result in the timber harvest of 14± acres on the 38-acre property and subsequent conversion of 13.5± acres, wherein a 12± acre vineyard would be developed. As noted in **Section 4.9 Land Use**, the Proposed Project is located within unincorporated Napa County and is designated as Agricultural Watershed (AW) per Napa County zoning. The harvest of timber and development of the vineyard under the Proposed Project would not conflict with existing County land use designations, surrounding land uses or local habitat conservation plans (**Sections 4.3** and **4.9**). The Proposed Project would not result in any of the following repercussions: 1) remove (or create) obstacles to growth; 2) cause a strain on existing community services provided in the region; 3) impede economic growth; or 4) cause a need for additional housing. Therefore, no indirect or growth inducing impacts would occur as a result of the Proposed Project.

6.2 CUMULATIVE IMPACT ANALYSIS

Cumulative impacts refer to the effects of two or more projects that, when combined, are considerable or compound other environmental effects. Cumulative impacts must consider the combined impact of past, present, and reasonably foreseeable future projects. When assessing a cumulative impact, an EIR must identify if the project makes a "cumulatively considerable" contribution to the cumulative environment. A project's contribution may be cumulatively considerable even if the project's individual impact is considered less than significant. CEQA Guidelines Section 15130(b) requires that discussion of cumulative impacts reflect the severity of the impacts and their likelihood of occurrence. The CEQA Guidelines state that the cumulative impacts discussion does not need to provide as much detail as is provided in the analysis of project-only impacts and should be guided by the standards of practicality and reasonableness. Pursuant to CEQA Guidelines Section 15130(b), this Draft EIR uses projections contained in the Napa County General Plan Environmental Impact Report (2007), General Plan (2008), and related planning documents, which describe or evaluate regional or area-wide conditions contributing to cumulative impacts.

6.2.1 GEOGRAPHIC SCOPE

CEQA requires that the cumulative analysis define the geographic scope of the area affected by the cumulative effect and provide a reasonable explanation for geographic limitations. As such, the analysis in this section will rely on projects that have the potential to contribute to cumulative impacts within the Kortum Canyon Creek watershed and that occur generally within a three mile radius of the property, with the exception of air quality, greenhouse gas emissions, and agriculture and forestry, which were analyzed within a larger area of impact as discussed in **Section 6.2.2** below.

6.2.2 CUMULATIVELY CONSIDERABLE IMPACTS

CEQA *Guidelines* Section 15130(a) provides the following direction with respect to the cumulative impact analysis and the determination of significant effects:

1. A cumulative impact consists of an impact that is created as a result of the combination of the project evaluated in the EIR together with other projects causing related impacts.
2. When the combined cumulative impact associated with the project's incremental effect is not significant, the EIR shall briefly indicate why the cumulative impact is not significant and is not discussed further.
3. An EIR may determine that a project's contribution to a significant cumulative effect will be rendered less than cumulative considerable and thus is not significant. A project's contribution is less than cumulatively considerable if the project is required to implement or fund its fair share of a mitigation measure or measures designed to alleviate the cumulative impact.

The following is an analysis of cumulative impacts related to the Proposed Project by environmental resource category as described in **Section 4.0**. Refer to **Section 4.0** for a detailed discussion of the nature and scope of impacts associated with the Proposed Project.

6.2.2-1 AGRICULTURE AND FORESTRY RESOURCES

Over the past thirty years, changes in the profitability of different commodities such as timber, cattle, and grapes, have led to shifts in land use across the state. During the roughly thirty year period from 1969 to 1998, approximately 40 percent of timberlands converted to nonagricultural uses occurred in the coast region, which includes the County of Napa. During the last decade of this thirty year period, from 1991 to 1999, Cal Fire data on timberland conversions shows that the percent of timberland converted to vineyards in Napa County was 17 percent, which constituted an estimated 200 acres of new vineyard development (Shih, 2002). In comparison, Mendocino and Sonoma counties lead the region in the percentage of timberland conversion to vineyards at 32 percent and 30 percent, respectively. This equates to roughly 375 acres in Mendocino County and 350 acres in Sonoma County for new vineyards. Therefore, over this period timberland conversion in Napa County was significantly less in number and in total acreage converted than the surrounding counties of Mendocino and Sonoma.

The Fire and Resource Assessment Program's (FRAP's) *Land Base of California Forests* report lists Napa County as having 22,000 acres of Commercial Conifer Timberland (Shih, 1998). Conifer Timberland is defined as growing more than 20 square-feet per acre per year. This 22,000 acres is a small portion of the nearly 131,136 acres of forest land in the entire County, which includes cypress forest, deciduous oak woodland, douglas-fir/Redwood

forest, evergreen oak woodland, evergreen oak woodland, deciduous, non-native woodland, and pine forest as classified and mapped by the County (Napa County, 2002). Other areas of the County, which may have forest land with commercial conifer growth, contain small and scattered areas that are not included under the general designation of Commercial Conifer Timberland. The property falls within one of these scattered areas and is not within the commercial forest land base of California. As noted in the THP, since the forested timber harvest portion (14± acres) of the property is so small and the Proposed Project would remove a small amount of timber volume that is not within the commercial forest land base of California, no significant impact can be expected to occur on timber resources of the state or its timber productivity and economy (Appendix U of **Appendix K**).

Timberland Harvest and Vineyard Conversions. Over the last decade (2000-2010), both timber harvest and timberland conversion projects in Napa County have reduced significantly as compared with previous years (Shih, 2002). Currently, besides the Proposed Project, there are only two additional timber harvest plans with associated vineyard conversion projects pending in the County based on Cal Fire statewide data (Cal Fire, 2011). Both of these projects are located within a 10-mile radius of the property. The first project proposed is an eight acre timberland harvest project in the Conn Creek watershed, which is located approximately 9.75 miles to the southeast of the Proposed Project. This project is eight acres in size; however, there is only approximately one acre of timber proposed to be harvested since the remaining seven acres is composed primarily of seedlings and brush vegetation (S. Butler, pers. comm., 2011). This one acre harvested area is proposed to be converted to vineyard. The second timber harvest project proposed within a 10-mile radius of the Proposed Project is located in the Swartz Creek watershed, approximately eight miles to the northeast of the subject property. This project is 25 acres in size; although, it contains only three acres of timberland that would be harvested and then converted to vineyard. The remaining acreage, consisting of 22 acres of grassland, would also be planted in vineyard (S. Butler, pers. comm., 2011).

Kortum Canyon Watershed. An analysis of potential impacts to the Kortum Canyon watershed from implementation of the Proposed Project is presented in Appendix U of the THP (**Appendix K**). The results of this analysis show that 24 percent of the Kortum Canyon watershed is currently used in some form of agriculture, primarily vineyards. Napa County Conservation Regulations presently exclude development on 54 percent of the watershed (**Appendix K**). These areas excluded from development are comprised of stream setbacks, slopes over 30 percent, and other limitations contained in the regulations. However, these excluded areas do not take into account the acreage limited by biological species, botanical species (i.e. listed species) or archeological sites. Therefore, it can be assumed that roughly two to six percent of additional acreage within the watershed falls under the later (undevelopable) category. For instance, territories and activity centers of the northern spotted owl alone, located within the watershed, have significantly limited land uses for at

least one to four percent of the total watershed. This means that approximately 60 percent of the watershed is not available for further development (**Appendix K**). In comparison, the Proposed Project's total acreage of conversion (13.5± acres) equates to approximately one percent of the watershed. When added to the existing 24 percent of the watershed currently in agricultural use, this minor increase (25 percent in total) from the Proposed Project is less than significant to the watershed as a whole. Therefore, no significant impact can be expected to occur to the state timber harvest volumes or the economic values to Napa County or the state due to the loss of timberland based on the following: the small amount of timber resources harvested annually in Napa County; the reduced number of timberland to vineyard conversions countywide; the small scale of timberland conversion to vineyard expected from the Proposed Project; and the small scale of the two proposed timberland conversion projects (one and three acres in size) within a 10-mile radius of the subject property (**Appendix K**). Therefore, cumulative impacts to agriculture and forestry resources would be considered less than significant.

6.2.2-2 AIR QUALITY

The geographic scope for the cumulative air quality impact analysis is the San Francisco Bay Area Air Basin (SFBAAB), because air quality impacts would affect the entire San Francisco Bay Area region. Cumulative air quality issues in the SFBAAB are addressed through regional air quality control plans developed by the Bay Area Air Quality Management District (BAAQMD). These plans account for projected growth in the Bay Area, as embodied in the adopted General Plans of the various cities and counties that comprise the Bay Area. There is, therefore, no need to identify each and every specific "probable future project" that might contribute emissions within the air basin.

Project Construction. Construction elements of the Proposed Project, including the timber harvest, installation of #P10-00309-ECPA, and development of the vineyard, concurrent with other projects in the air basin would generate emissions of criteria pollutants, including suspended and inhalable particulate matter (PM_{10}) and equipment exhaust emissions. As discussed in **Section 4.2,** for construction-related impacts, the BAAQMD has developed cumulative significance thresholds of 54 pounds per day for oxides of nitrogen (NO_X), reactive organic gases (ROG), and $PM_{2.5}$ and 82 pounds per day of PM_{10}, and recommends basic construction mitigation for all projects (BAAQMD, 2010). Construction emissions from the development of the Proposed Project would not exceed the BAAQMD threshold with implementation of a fugitive dust abatement program under **Mitigation Measure 4.2-1** (**Section 4.2**). The BAAQMD Guidelines take into account past, present, and future emissions of criteria pollutants; therefore, since the project would not exceed BAAQMD thresholds the cumulative impacts due to construction would be less than significant.

Project Operation. The BAAQMD also provides cumulative operational significance thresholds for NOx, ROG, $PM_{2.5}$ and PM_{10} (BAAQMD, 2010). The San Francisco Bay Area

Air Basin (SFBAAB) non-attainment status for NOx, ROG, $PM_{2.5}$ and PM_{10} is attributed to the region's development history. Past, present, and future development contribute to the region's adverse air quality impacts on a cumulative basis. By its very nature, air pollution is largely a cumulative impact; no single project is sufficient in size to, by itself, result in non-attainment of the ambient air quality standards. However, if a project contribution is considerable, then the project's cumulative impact on regional air quality would be considered significant. Cumulative thresholds are the same as project thresholds, which are provided in **Section 4.2**. As shown in **Table 4.2-4** in **Section 4.2**, project-related NOx, ROG, $PM_{2.5}$ and PM_{10} emissions would not exceed the BAAQMD cumulative operational significance thresholds. The potential cumulative contribution to air quality impacts associated with operation of the Proposed Project would be further reduced through the implementation of **Mitigation Measure 4.2-1** discussed in **Section 4.2**.

6.2.2-3 BIOLOGICAL RESOURCES

Cumulative projects in the vicinity of the property, including growth resulting from build-out of the County's General Plan and any proposed future agricultural development in the vicinity of the property, are anticipated to permanently remove plant and wildlife resources, which could affect special status species and their habitat, nesting and foraging habitat for resident and migratory birds, and/or local policies or ordinances protecting biological resources. As development in the region continues, sensitive plant and wildlife species native to the region and their habitat, including those species listed under the California Endangered Species Act (CESA) and the federal Endangered Species Act (ESA) and those individuals identified by state and federal resources agencies as species of concern, fully protected, or sensitive will be lost through conversion of existing open space to urban development. Although mobile species may have the ability to adapt to modifications to their environment by relocating, less mobile species may be locally extirpated. With continued conversion of natural habitat to human use, the availability and accessibility of remaining foraging and natural habitats in this ecosystem would dwindle and those remaining natural areas may not able to support additional plant or animal populations above their current carrying capacities. The conversion of plant and wildlife habitat on a regional level as a result of cumulative development would potentially result in a regional significant cumulative impact on special status species and their habitats.

Impacts to Biological Resources During Construction

As discussed in **Section 4.3.1-2**, potential impacts to biological resources analyzed in this EIR include impacts from both the precursor timber harvest phase and the ECP and vineyard installation under the Proposed Project. It should be noted that the project design incorporates setbacks from sensitive wildlife areas and onsite water resources. As a result, few habitat types would be impacted by construction and operation of the Proposed Project.

Section 4.3 includes mitigation measures to reduce potential impacts to special status species (**Mitigation Measures 4.3-4**, **4.3-5**, **4.3-6**, **4.3-7**, and **4.3-8**) and habitats (**Mitigation Measures 4.3-1**, **4.3-2**, and **4.3-3**) during construction to less than significant levels The County would similarly require future projects with potentially significant impacts to wildlife and plant species in the vicinity of the Proposed Project to comply with federal, state and local regulations and ordinances and to mitigate for potential impacts to biological resources during construction. Such future projects with the incorporation of appropriate mitigation and approval of local, state, and federal agencies would reduce impacts to cumulative environmental conditions to less than significant levels.

Impacts to Biological Resources Due to Vineyard Conversion

Although vineyards only provide limited habitat value for wildlife, local regulations ensure that installation of vineyards do not necessarily represent a total loss of habitat for wildlife. Napa County Conservation Regulations (Napa County Code, Chapter 18.108) require projects to maintain portions of open space on parcels proposed for development, which provides habitat for plants and foraging and nesting opportunities for wildlife. As noted earlier, Napa County Conservation Regulations generally preclude development on slopes greater than 30 percent and require setbacks of 35 to 150 feet from all County-definitional streams (depending on slopes). These County regulations would apply to any future projects in the vicinity of the Proposed Project, which would lessen any potential impacts to the Kortum Canyon Creek and Simmons Creek watersheds.

Coast Redwood Forest. As discussed in **Section 4.3**, Coast Redwood Alliance is considered a sensitive biotic community in Napa County due to its limited distribution. The Proposed Project would remove 0.27 acre of Coast Redwood Forest from the property and replace it with vineyard. Due to past timber harvest practices on the property, the Coast Redwood Forest identified onsite is not considered high quality. Impacts to Coast Redwood would be reduced to less than significant levels with the protection of nearly 95 percent (4.96 acres) of this habitat remaining onsite. Designated Coast Redwood Enhancement Areas in the northeast and southeast portions of the property for Coast Redwood Forest are shown in **Figure 4.3-3**. Since the Proposed Project would only marginally affect this species onsite, this impact would be considered less than significant. Further, under cumulative conditions, avoidance, protection, and enhancement techniques would be utilized for any future projects in the vicinity, consistent with Napa County Conservation Regulations, which would result in less than significant impacts to Coast Redwood Forest.

Oak Woodland. As stated in **Mitigation Measure 4.3-1**, mitigation for the removal of approximately 3.35 acres of oak woodland under the Proposed Project would be accomplished through a combination of 1) avoidance of oak woodlands remaining within the property and immediate vicinity; 2) protection of oak woodlands having the highest habitat values; and 3) enhancement of existing oak woodlands onsite (**Figure 4.3-3**). Cumulatively,

any future projects in the vicinity of the property would require similar avoidance, protection, and enhancement of any affected oak woodlands, consistent with Napa County's Conservation Regulations, which would lessen cumulative impacts to oak woodlands to less than significant levels.

Special Status Species. Habitats on the property where special status species may occur include: California Annual Grassland, Black Oak Woodland, Douglas Fir Forest, Coast Redwood Forest, and Big Leaf Maple Forest. Although the project proposes to remove portions of these habitats, they are still relatively common in the cumulative environment. As shown in **Table 4.3-1** of **Section 4.3**, the acreage of onsite habitat types removed by the Proposed Project total less than 0.15 percent of each habitat type represented in the County. Specific mitigation and avoidance measures (**Mitigation Measures 4.3-1**, **4.3-2**, and **4.3-3)** specified in **Section 4.3** reduce the cumulative impacts to habitats host to potentially occurring special status species to less than significant levels.

Northern Spotted Owl. As stated in **Section 4.3**, the acreage of northern spotted owl habitat that would be removed by the Proposed Project equals 14± acres or 2.8 percent of suitable habitat within a 0.7 mile radius or 1.04 percent of suitable habitat within a 1.3 mile radius of the property (**Impact 4.3-6**). Further, the findings of the northern spotted owl study (**Appendix D**), state that the THP abides by California Forest Practice Rule 14 CCR 919.9(e) Scenario 4: Avoidance of Disturbance and Direct Take through Habitat Retention (Forest Ecosystem Management, LLC, 2011). Due to the small size of the project and the fact that the habitat retention standards would be met for post-project conditions for both activity centers NAP007 #1 and NAP007 #2, which are the closest activity centers to the Proposed Project, with implementation of **Mitigation 4.3-8** impacts to northern spotted owl habitat would be considered less than significant (**Section 4.3**).

Additionally, for all known or future activity centers within 1.3 miles of the property, the following habitat retention levels are required to lessen cumulative impacts to northern spotted owl territories from the Proposed Project or any future projects in the vicinity (Forest Ecosystem Management, LLC, 2011). Exceptions to any of the habitat retention levels must be mitigated with the appropriate regulatory agency.

A. Within 1,000 feet of each activity center: There will be no timber operations other than the use of existing roads.
B. Seasonal Restrictions will be applied for any activity center within 0.25 mile.
C. Within a 0.7 mile radius of, and centered on, each activity center:
    i. Habitat shall be retained to maximize attributes desirable for northern spotted owls.
    ii. At least 500 acres of suitable habitat shall be present, as follows:
        1. 200 acres of nesting/roosting habitat.

a. No timber harvest shall occur within the 100 acres of nesting/roost habitat immediately surrounding each activity center.
b. If the remaining 100 acres of nest/roost habitat is contiguous with the activity center or is located within the same drainage, harvest shall not reduce the pre-harvest basal area of these acres by more than 33 percent and retain post harvest at least 100 ft^2 per acre of basal area in trees greater than 11 inches diameter at breast height (dbh).
c. If the remaining 100 acres of nest/roost habitat is not contiguous with the activity center or is not located within the same drainage, retain greater than 60 percent canopy cover of trees greater than 11 inches dbh.

2. Greater than 300 acres of suitable habitat.

iii. No more than 1/3 of the reaming suitable habitat shall be harvested during the life of the plan.

D. Between 0.7 mile and 1.3 mile radius circles centered on each activity center:

i. Greater than 836 acres of suitable habitat must be present.
ii. No more than 1/3 of the remaining suitable habitat shall be harvested during the life of the plan.

Implementation of the above habitat retention standards would lessen cumulative impacts of any future project in the vicinity of any active northern spotted owl territories indentified in the local area to less than significant levels. As noted in **Section 4.3**, any future projects in the cumulative environment would be required to adhere to recommended USFWS northern spotted owl survey protocols.

Protection of Stream and Wildlife Corridors. Protection of stream corridors that function in part as wildlife movement routes connected to larger habitat areas, provide overall connectivity within the landscape and add to the value of these areas as wildlife corridors. As part of the project, deer fencing would surround the vineyard blocks (refer to **Figure 3-5**), which would prevent large wildlife from entering the vineyard. There would be impacts to large animal movement as a consequence of the installation of the deer fencing; however, maintenance of stream setbacks during project construction and operation would allow for small wildlife movement to continue along stream corridors. Minimum 50-foot setbacks would be maintained around the wet area and spring as well. These areas would be protected from development during construction and operation of the Proposed Project. Protection of stream corridors and their intrinsic function as wildlife corridors, is included in the Napa County Code (Section 18.108.030), which describes designations for appropriate stream setbacks. Therefore, for any future projects in the vicinity, cumulative impacts to streams and their function as wildlife corridors would be mitigated via application of Napa County Code standards, which would reduce potential effects to less than significant levels.

In summary, the Proposed Project's contribution to regional impacts to biological resources would be less than cumulatively considerable. With implementation of the above mitigation measures and those found in **Section 4.3**, impacts would be considered less than significant.

6.2.2-4 CULTURAL RESOURCES

Potential projects in the vicinity of the property, including growth resulting from build-out of the County's General Plan and proposed agricultural development in the vicinity of the property, have the potential to cumulatively impact cultural resources. Archaeological and historic resources are afforded special legal protections designed to reduce the cumulative effects of development. Potential cumulative projects and the Proposed Project would be subject to the protection of cultural resources afforded by the CEQA Guidelines Section 15064.5 and related provisions of the Public Resources Code. In addition, projects with federal involvement would be subject to Section 106 of the National Historic Preservation Act. Given the non-renewable nature of cultural resources, any impact to protected sites could be considered cumulatively considerable. As discussed in **Section 4.4**, only one cultural resource (the Jasud Spring Site) has been identified within the property. It is located within an area that has the potential for ground disturbance through the continued use of the extant dirt road as associated with the Proposed Project. However, this area will be buffered from all project activities by a minimum 50 foot setback so the likelihood for disturbance is low. Formal resource evaluations for this site have not been undertaken.

Mitigation Measures 4.4-1 through **4.4-3** in **Section 4.4** provide for the protection of unanticipated discoveries during ground disturbing activities. With the implementation of these mitigation measures, the Proposed Project's incremental contribution to cumulative impacts to cultural resources is considered to be less than significant.

6.2.2-5 GEOLOGY AND SOILS

Implementation of the Proposed Project and other potential cumulative projects in the region, including growth resulting from build-out of the County's General Plan and other proposed agricultural development in the vicinity of the property, could result in increased erosion and soil hazards and could expose additional structures and people to seismic hazards. Potential soil and seismic hazards from cumulative development could represent a significant cumulative impact if such projects do not incorporate grading/erosion plans and are not developed to the latest building standards by incorporating recommendations from site-specific geotechnical reports prepared for these such projects. As stated in **Section 4.5**, there were four technical reports prepared for the Proposed Project: the ECP (NVVE, 2011), the Engineering Geological and Geotechnical Evaluation (Gilpin, 2011), the Erosion and Sediment Delivery Analysis (OEI, 2011a), and the Erosion Mitigation Assessment Report (OEI, 2011b). These technical studies include mitigation measures that are specifically designed for and included as part of the Proposed Project (refer to **Section 3.0**),

which would reduce impacts during construction and operation of the Proposed Project to local geology and soils. The Applicant would implement the recommended mitigation measures and design specifications included in the ECP and supporting technical reports, which are designed to avoid, reduce, or mitigate potential impacts associated with geology and soils. Therefore, after mitigation, cumulative impacts of the Proposed Project would be considered less than significant.

6.2.2-6 GREENHOUSE GAS EMISSIONS

As discussed in **Section 6.2.2-2** above, cumulative air quality issues in the SFBAAB are addressed through regional air quality control plans developed by the Bay Area Air Quality Management District (BAAQMD). These plans account for projected growth in the Bay Area, as embodied in the adopted General Plans of the various cities and counties that comprise the Bay Area. There is, therefore, no need to identify each and every specific "probable future project" that might contribute emissions within the air basin.

Project Construction. The Proposed Project's design reduces GHG emissions from construction by 57 percent from "business as usual" practices, which results in a less than significant impact to climate change. Since the County's draft Climate Action Plan (CAP) provides for a reduction in GHG emissions by 52 percent, the Proposed Project meets the draft CAP standard. While the draft CAP represents a guiding framework for this analysis and since the draft CAP has not yet been adopted by the County, State goals are used in this analysis as the basis for determining less than significant impacts during project construction. The BAAQMD standards of 1,100 metric tons (MT) per year or less are used as the basis for determining project operational significance.

As stated in **Section 4.6**, the total construction GHG emissions from the Proposed Project would be 1,941 MT of CO_2e. The Applicant would additionally reduce construction-related GHG emissions from the Proposed Project with implementation of **Mitigation Measure 4.6-1**. Since construction is to be completed over two years, the average annual construction emissions would be less than the BAAQMD operational levels of significance of 1,100 MT of CO_2e per year. This impact would be less than significant with implementation of **Mitigation Measure 4.6-1**.

Project Operation. As shown in **Section 4.6**, **Table 4.6-2**, operational GHG emissions would be less than the BAAQMD CEQA threshold of 1,100 MT of CO_2e for project-level operation. Therefore, operation of the Proposed Project would not result in cumulatively impacts to climate change.

6.2.2-7 HAZARDOUS MATERIALS

If unmitigated, construction and operation of the Proposed Project in combination with potential cumulative development in the project vicinity could lead to impacts related to hazardous materials. The Proposed Project and similar agricultural projects in the vicinity over cumulative future years, would all involve the storage, use, disposal, and transport of hazardous materials to varying degrees during construction. Impacts related to these activities are extensively regulated by various federal, state, and local agencies and it is assumed that similar projects would also comply with these hazardous materials regulations.

Operation of the Proposed Project and cumulative projects in the vicinity could result in impacts if development were to result in potential exposure of hazardous materials to sensitive individuals or the general public-at-large, or if additional projects in the vicinity were to include the use or storage of hazardous materials. However, operation of the vineyard under certified Biodynamic practices would largely prohibit the use of chemicals such as pesticides and herbicides and would therefore result in a low risk for adverse effects. Because hazardous materials impacts are site-specific and the Proposed Project would not utilize or require substantial volumes of hazardous materials, the project would not contribute to cumulatively considerable hazardous impacts. Furthermore, **Mitigation Measures 4.7-1** through **4.7-4** (**Section 4.7**) include measures to ensure that any hazardous materials that are stored or used onsite would be property maintained, reducing the risk of spills or adverse effects. With implementation of these mitigation measures, the Proposed Project would not cause cumulatively considerable impacts to the environment from hazardous materials use.

6.2.2-8 HYDROLOGY AND WATER QUALITY

The property is located within the drainage area of the Kortum Canyon creek watershed, which constitutes roughly 1,852 acres. As stated in **Section 4.8**, the analysis of impacts to hydrology and water quality from the Proposed Project included factors such as topography, drainage, and other physical features of the local area. For this cumulative impact analysis, potential impacts of the Proposed Project in addition to cumulative impacts of other timberland harvests and conversion projects within the watershed form the scope of this discussion.

Protection of Stream Corridors and Water Quality. The Proposed Project includes the maintenance of stream setbacks, the restriction of earthmoving activities to the dry season consistent with County Code Section 18.108.070(L), and the installation of straw wattles, seeding and mulching of disturbed areas, and other erosion control measures and best management practices (BMPs) discussed in **Section 3.0 Project Description,** which would reduce the potential for sedimentation in the Kortum Canyon Creek watershed. The Proposed Project would not increase runoff rates or volumes, or degrade water quality (as

discussed in **Section 4.8 Hydrology and Water Quality**) and would not increase soil erosion or sedimentation (as discussed in **Section 4.5 Geology and Soils**).

As shown in **Section 4.8**, implementation of the ECP for the Proposed Project would result in improved conditions to on- and off-site water quality. Under the ECP for the Proposed Project, the onsite entry road to the property would be improved through the installation of erosion control features to reduce current siltation and erosion conditions. As stated in **Section 4.8.1-3**, the Napa River is currently listed as an impaired water body for nutrients, pathogens, and sediment under Section 303 (d) of the Clean Water Act (CWA). Runoff from the property is eventually transported to the Napa River; therefore, from a cumulative standpoint, implementation of the ECP under the Proposed Project would be beneficial by improving onsite and off-site water quality by lessening cumulative sedimentation impacts to the Napa River.

Erosion Control Plans in the Kortum Canyon Creek Watershed. As shown in **Table 6-1**, from 1992 to 2001, there were 11 ECPs approved for new vineyard development within the Kortum Canyon Creek watershed. Since 2001, there have been no new ECP applications submitted to the County for vineyard development within the watershed except for the Proposed Project. Therefore, the Proposed Project represents the only new vineyard development within the watershed currently on record at the County that has been proposed over the last ten years (Napa County, 2011).

TABLE 6-1
EROSION CONTROL PLANS IN KORTUM CANYON CREEK WATERSHED

Name on File	Date Applied	Date ECP Approved	Project Acreage	ECP Type
Diamond Creek Vineyards	04-22-1996	05-08-1996	1.40	Ag New Track I
Diamond Creek Vineyards	10-05-1999	05-12-2000	5.50	Ag New Track I
Sterling Vineyards	09-22-1998	09-25-1998	60.00	Ag Track I Replant
Jim Barbour	09-24-1996	10-08-1996	38.00	Ag New Track I
Gilbert Lamphere	07-10-1997	08-18-1997	2.90	Ag New Track I
Edward Wallis	01-29-1997	09-08-1997	13.40	Ag New Track I
William Baker	07-29-1999	06-09-2000	0.65	Ag New Track I
Fred Constant	10-11-1995	02-06-1998	15.00	Ag New Track I
Napa Valley Vineyard Engineering	04-25-2000	05-13-2001	6.10	Ag New Track I
Dyer Vineyards	07-20-1992	08-06-1992	6.05	Ag New Track I
Rudy Vonstrasser	07-14-1997	01-27-1998	4.31	Ag New Track I
Jasud Estate LLC	09-07-2010	Pending	15.10	Ag New Track I

Source: Napa County, 2011.

The Proposed Project, the only currently proposed ECP within the watershed, represents one percent of the entire watershed (**Section 6.2.2-1**; **Table 6-1**). As stated in **Section 4.8**, with implementation of the ECP, the Proposed Project would not significantly impact hydrology and water quality within the watershed. Therefore, cumulative impacts from the Proposed Project to hydrology and water quality would be less than significant.

As stated in **Section 6.2.2-1**, there are only two other proposed THPs within a 10-mile radius of the property and within Napa County, which are currently on file with Cal Fire. These THP projects would result in one- and three-acres of harvested timberland, respectively. Since the Proposed Project would not result in significant impacts to the watershed and since each of these other THP projects would be required to have a County-approved ECP prior to construction or timber removal, the Proposed Project in combination with cumulative impacts from these other THP projects within a 10-mile radius would not significantly impact watersheds in the surrounding area. Further, any off-site future projects in the vicinity of the property would be required to adhere to Napa County Code (including developments requiring County approval of an ECP), as well as state and federal requirements pertaining to water quality (**Section 4.8**). Combined, implementation of these requirements would lessen future cumulative impacts to hydrology and water quality within the Kortum Canyon Creek watershed and those areas within a 10-mile radius of the property to less than significant levels.

6.2.2-9 LAND USE

Potential cumulative projects in the vicinity of the property, including growth resulting from build-out of the County's General Plan and proposed agricultural developments in the vicinity of the property, would be developed in accordance with local and regional planning documents; thus, cumulative impacts associated with land use compatibility are expected be less than significant. Additionally, as discussed in **Section 4.9**, the Proposed Project would not result in a substantial inconsistency with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project adopted for the purpose of avoiding or mitigating an environmental effect. Further, the Proposed Project is consistent with the County zoning ordinance, and General Plan (2008) land use designations, goals, and policies, and therefore would not cause cumulative impacts to land use.

6.2.2-10 NOISE

Construction. Construction of the Proposed Project is unlikely to occur in combination with potential future development projects in the vicinity because the area is rural and surrounding County designated land uses include rural residences, vineyards, and agriculture. Further, there would not likely be any other projects occurring in the immediate area of the Proposed Project concurrent with the project's construction phase; no other ECPs are currently filed with the County for construction projects in the area (refer to **Section 6.2.2-8**). Operational noise from the adjacent vineyard to the west would be the only other source of agricultural-related noise in the immediate vicinity during construction of the Proposed Project.

As stated in **Section 4.10,** the nearest noise sensitive receptor to construction activities is a residence located approximately 380 feet west of the property. Analysis of potential noise

impacts on this receptor included factors such as the hilly topography and natural noise barriers (trees and vegetation), which attenuate noise impacts. The results concluded that the maximum noise level at the nearest sensitive noise receptor during construction of the Proposed Project would be approximately 69 dBA Leq, which is below the County's noise threshold of 75 dBA, Leq for construction near residential areas. Furthermore, construction activities associated with the Proposed Project shall occur between the hours of 7 AM to 7 PM, which is consistent with County Ordinance 8.16.080 2.

Construction of the Proposed Project in combination with cumulative sources of noise in the vicinity would not expose persons to temporary or substantial permanent increases in the ambient noise level or generate noise levels in excess of standards established in the General Plan, County noise ordinance, or applicable standards of other agencies.

Operation. As stated in **Section 4.10**, operation of the Proposed Project generally consists of replanting, pruning, harvesting, and grape transport associated with vineyard management. Operational noise would be further reduced with the implementation of the following agricultural activities, which are incorporated as part of the project design: 1) dry farming techniques, which would reduce or eliminate the noise of water pumps and irrigation; 2) hand farming and no-till planting, which would reduce or eliminate noise from farm equipment; and 3) hand pulling of intrusive weeds and pest management using herbicides, which would be applied via non-motorized means. As stated in **Section 4.10**, the Proposed Project would slightly increase the ambient noise level in the immediate vicinity of the property. However, given the small size of the project, the location of the project (adjacent to an active vineyard), the low-density residential uses in the area, and the County's General Plan Policy CC-35, which states that agriculture and agricultural processing is considered an acceptable and necessary part of the community character of Napa County and is not considered to be undesirable, the Proposed Project's contribution to potential cumulative impacts associated with ambient noise levels would be considered less than significant.

6.2.2-11 TRANSPORTATION AND CIRCULATION

As stated in **Section 4.11**, operation of the Proposed Project would generate trips on account of vineyard maintenance and grape harvest. Operational traffic associated with the Proposed Project would be greatest during harvest of the vineyard. During operation of the Proposed Project, grape harvest will be transported in farm trucks to wineries in the Napa Valley area. The grape harvest is expected to transport 50± tons annually over local roads using farm trucks (Appendix E of **Appendix K**). Grape harvest activities under the Proposed Project are anticipated to generate 30 trips per year. This type of agricultural traffic anticipated to be generated by the Proposed Project would be minimal and very similar to other agricultural transport activities (i.e. grapes, cattle, sheep, horses, apples,

rock aggregates, fire wood, etc.) presently taking place on local roadways in the vicinity of the Proposed Project (Appendix E of **Appendix K**).

In summary, this long-term addition of operational trips to Diamond Mountain Road would be minimal, seasonal, and would not exceed capacity on existing roadways serving the property and in the vicinity; therefore, operation of the Proposed Project would not result in cumulative impacts to transportation and circulation in the area.

6.3 SIGNIFICANT AND UNAVOIDABLE IMPACTS

As stated in **Section 4.0**, there are no significant and unavoidable impacts that would result from implementation of the Proposed Project.

6.4 IRREVERSIBLE CHANGES

State CEQA Guidelines Section 15126.2(c) provides the following direction for the discussion of irreversible changes:

> *"Uses of nonrenewable resources during the initial and continued phases of the project may be irreversible since a large commitment of such resources makes removal or nonuse thereafter unlikely. Primary impacts and, particularly, secondary impacts (such as highway improvement which provides access to a previously inaccessible area) generally commit future generations to similar uses. Also irreversible damage can result from environmental accidents associated with the project. Irretrievable commitments of resources should be evaluated to assure that such current consumption is justified."*

The Proposed Project would result in an irreversible use of energy resources, primarily fossil fuels for construction equipment (e.g., fuel, oil, natural gas, and gasoline), and the consumption or destruction of other nonrenewable or renewable resources (e.g., timber, gravel, metals, and water). However, operation of the Proposed Project would not require any long term or cumulative commitment of these resources other than the minimal equipment and materials needed to maintain the vineyard per specifications as a Biodynamic vineyard certified by Demeter, USA. As stated in **Section 3.0**, operation of the Proposed Project would involve the use of less chemicals, electricity, and fuel for equipment as compared to standard vineyard practices pursuant to the sustainable farming approaches and standards of Biodynamic farms. Biodynamic farming techniques applied to the Proposed Project will reduce impacts to the environment in the long term.

Installation of the erosion control measures, including detention ponds, under the ECP would involve relatively small quantities of agricultural materials (some of which are nonrenewable) and would consume limited energy due to the dry farming and hand tilling techniques to be applied over the life of the vineyard after initial establishment. The

Proposed Project would also result in a temporary increase in car and truck trips during construction, which will be largely reduced during the operational phase. These additional trips would also require the use of fossil fuels and other nonrenewable resources.

REFERENCES

Bay Area Air Quality Management District (BAAQMD), 2010. *BAAQMD California Environmental Quality Act Air Quality Guidelines.* Prepared by the Bay Area Air Quality Management District. Available online at: http://www.baaqmd.gov/Divisions/Planning-and-Research/CEQA-GUIDELINES/Updated-CEQA-Guidelines.aspx. June 2010.

Butler, Scott, 2011. Personal Communication via telephone. October 17, 2011 and November 4, 2011.

California Department of Forestry and Fire Protection (Cal Fire), 2011. Timber Harvest Plans Status Table. Current as of October 17, 2011 (date of access). Available online at: http://www.fire.ca.gov/resource_mgt/resource_mgt_forestpractice_thpstatus.php.

Forest Ecosystem Management, LLC., 2010. Northern Spotted Owl Take Avoidance. Prepared for the Jasud Estate THP. November 22, 2010.

Gilpin Geosciences (Gilpin), Inc. 2011. Engineering Geological and Geotechnical Evaluation Jasud Vineyard, APN 02-300-005, 2087 Diamond Mountain Road, Calistoga, California. Prepared for Jasud Mountain Vineyards, Napa County, California.

Napa County, 2002. Napa County Vegetation Alliances GIS data. Available online at: http://www.countyofnapa.org/Conservation/. Accessed October 3, 2011.

Napa County, 2007. Draft Environmental Impact Report. Napa County General Plan Update. February 2007. Available online at http://www.napacountygeneralplan.com/library/files/DEIR/5%200%20Cumulative%20Impacts.pdf.

Napa County, 2008. Napa County General Plan. June 2008. Available online at: http://www.countyofnapa.org/GeneralPlan/.

Napa County, 2011. Napa County Data on Total ECPs in Kortum Canyon Creek Watershed. Personal communication via email with Kelli Felker. November 4, 2011.

Napa Valley Vineyard Engineering (NVVE), 2011. Jasud Estate LLC, Jasud Estate Vineyard Erosion Control Plan for New Vineyard. Revision 3. Dated August 17, 2011.

O'Connor Environmental Inc. (OEI), 2011a. Erosion and Sediment Delivery Analysis, Jasud Estate Vineyard. Prepared for Analytical Environmental Services. July, 2011.

O'Connor Environmental Inc. (OEI), 2011b. Jasud Estate Vineyard Eroision Mitigation Assessment Report. Prepared for Analytical Environmental Services. July, 2011.

Shih, Tian-Ting, 1998. Land Base of California's Forests. Fire and Resource Assessment Program. California Department of Forestry and Fire Protection. December 1998.

Shih, Tian-Ting, 2002. Timberland Conversion in California from 1969 to 1998. Technical Working Paper 1-01-02. Fire and Resource Assessment Program. California Department of Forestry and Fire Protection.

CHAPTER 7.0

REPORT PREPARATION

7.1 LEAD AGENCY

CALIFORNIA DEPARTMENT OF FORESTRY AND FIRE PROTECTION
Attn: Dennis Hall
P. O. Box 944246
Sacramento, CA 94244-2460

7.2 RESPONSIBLE AGENCY

NAPA COUNTY CONSERVATION, DEVELOPMENT AND PLANNING
Attn: Brian Bordona
1195 Third Street, Suite 210
Napa, CA 94559

7.3 EIR CONSULTANTS

ANALYTICAL ENVIRONMENTAL SERVICES
1801 7th Street, Suite 100
Sacramento, CA 95811
(916) 447-3479

David Zweig, Project Director
Pete Bontadelli, Biological Resources Director
Jessica Griggs, Deputy Project Manager

Ashley Wells, Associate Environmental Specialist
Erin Quinn, Technical Specialist
Laura Burris, Biologist
Chad Steinwand, Associate Environmental Specialist
Erin Evan, Associate Environmental Specialist
Dana Hirschberg, Senior Graphic Designer
Glenn Mayfield, Graphic Designer

ENVIRONMENTAL RESOURCE MANAGEMENT
Scott Butler, Registered Professional Forester
889 Hwy 20-26
Ontario, OR 97914

O'CONNOR ENVIRONMENTAL
Matt O'Connor, Hydrologist
P. O. Box 794
Healdsburg, CA

KJELDSEN BIOLOGICAL CONSULTING
Daniel Kjeldsen, Biologist/Botanist
923 St. Helena Ave
Santa Rosa, CA 95404

TOM ORIGER AND ASSOCIATES
Tom Origer, Archaeology/Historical Research
P.O. Box 1531
Rohnert Park, California, 94927

GILPIN GEOSCIENCES, INC.
Lou M. Gilpin, Geologist
3228 Silverado Trail
St. Helena, CA 94574

NAPA VALLEY VINEYARD ENGINEERING, INC.
Drew Aspegren, P.E., Civil Engineer
176 Main St Ste B
Saint Helena, CA

7.4 FEDERAL AGENCIES CONSULTED

United States Fish and Wildlife Service

7.5 STATE AGENCIES CONSULTED

Native American Heritage Commission
California Department of Fish and Game
California Department of Mines and Geology
California Department of Toxic Substances Control
State Water Resources Control Board, Division of Water Rights

7.6 LOCAL GOVERNMENT AGENCIES CONSULTED

Napa County, Conservation, Development and Planning Department
Napa County Resource Conservation District